

# **ACADEMIC COUNCIL MEETING**

**1<sup>st</sup> March 2024, Friday**

**VENUE : Fr.PRINCE HALL**



## **ARUL ANANDAR COLLEGE**

**(AUTONOMOUS)**

**Affiliated to Madurai Kamaraj University**

**Reaccredited by NAAC at 'A' Grade with a CGPA of 3.15**

**(DST – FIST Sponsored College)**

**ANANDA NAGAR, KARUMATHUR – 625 514**

**MADURAI DISTRICT**



**Academic Council Meeting**  
**1<sup>st</sup> March, 2024**  
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**KARUMATHUR, MADURAI - 625 514**

**THE ACADEMIC COUNCIL MEETING**

**(1<sup>st</sup> March 2024, Friday)**

Venue: <b>Fr PRINCE HALL</b>	Time: <b>10.30 a.m.</b>
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**AGENDA**

- 1.00 Prayer : **Dr.P.Jerlin Rupa**, Head, Dept. of Business Administration.
- 2.00 Welcome and Introductory Remarks: **Rev.Dr.M.Anbarasu, SJ**, Principal and Chairperson, Academic Council.
- 3.00 Business brought forward by **Dr.D.Antony Singh Dhas**, Dean for Academic Affairs
- 3.01 **Dr.D.Antony Singh Dhas** will bring:
- 3.02 To receive, consider and pass the minutes of the previous meeting of the Academic Council held on 2<sup>nd</sup> March 2023.
- 3.03 That the recommendation to introduce two year Part – I language courses for the UG programmes that had so far only one year Part – I language courses, be approved. (as per the order of the Government of Tamil Nadu)
- 3.04 That the recommendation to convert B.Sc. Information Technology and Management into B.Sc. Information Technology from the academic year 2024-25, be approved.  
**(Rev.Dr.A.Sebastian Mahimairaj, MMC to second the same)**
- 4.00 Business brought forward by the Controller of Examinations.
- 4.01 **Rev.Dr.A.Sebastian Mahimairaj** will move:
- 4.02 That the appointment of question paper setters and examiners for the November 2023 and April 2023 semester examinations, be approved.
- 4.03 That the publication of results of the examinations held in April 2023 and November 2023, be approved.  
**(Dr.G.Gurusamy, to second the same)**
- 5.00 Business brought forward by various Boards of Studies

6.00 The Board of Studies in **Tamil** at its meeting held on 10.01.2024 passed the following resolution.

6.01 Accordingly, this is placed before the Academic Council for approval.

6.02 **Dr.G.Gurusamy**, Chairperson, Board of Studies in Tamil, will move:

6.03 2023-24 ஆம் கல்வியாண்டிலிருந்து இளங்கலை மற்றும் முதுகலை படிக்கும் மாணவர்களுக்கு தகுதி மேம்பாட்டுத் தாள்களாகிய **போட்டித் தேர்வு தமிழ்** மற்றும் **தமிழ் ஊடகம்** ஆகியவற்றை அறிமுகப்படுத்தும் தீர்மானத்திற்கு ஒப்புதல் பெறுதல். **(P.No.28)**

**(Ms.A.Josephine Sahaya Mary, to second the same)**

7.0.0 The Board of Studies in **English** at its meeting held on 10.01.2024 passed the following resolution.

7.01 Accordingly, this is placed before the Academic Council for approval.

7.02 **Ms.A.Josephine Sahaya Mary**, Chairperson, Board of Studies in English, will move:

7.03 That the recommendation of the Board of Studies to introduce a New Value Added Course titled **English for TNPSC, SSC, IFS & Banking Examinations** in Odd semester for UG and PG programme and to introduce the same for the students who have joined from the academic year 2023-24 onwards, be ratified. **(P.No.34)**

**(Dr.T.Kala, to second the same)**

8.0.0 The Board of Studies in **History** at its meeting held on 10.01.2024 passed the following resolutions.

8.01 Accordingly, these are placed before the Academic Council for approval.

8.02 **Dr.T.Kala**, Chairperson, Board of Studies in History, will move:

8.03 That the recommendation of the Board of Studies to introduce **Core-8: Principles and Methods of Archaeology** in Semester V of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.35)**

8.04 That the recommendation of the Board of Studies to Modify **Core-10 : Indian Polity** in semester V and **Core-12 : India Since Independence, Core-15 : International Relations (Since 1945 CE) and Core-16 : Human Rights** in semester VI of the UG Programme, and to introduce the same for the students who joined from June 2022 onwards, be approved.

8.05 That the recommendation of the Board of Studies to introduce New Value Added Courses titled **Food Heritage of India** in Odd Semester and **Heritage Tourism of**

**India** in Even Semester for UG and PG programmes and to introduce the same for the students who have joined from the academic year 2023-24 onwards, be ratified. **(P.No.75)**

**(Dr.I.Jeyaraj to second the same)**

9.00 The Board of Studies in **Economics** at its meeting held on 10.01.2024 passed the following resolution.

9.01 Accordingly this is placed before the Academic Council for approval.

9.02 **Dr.I.Jeyaraj**, Chairperson, Board of Studies in Economics, will move:

9.03 That the recommendation of the Board of Studies to modify the syllabus for all the Core courses in Semesters V & VI of the UG Programme and to introduce the same for the students who have joined from June 2022 onwards, be approved. **(P.No.81)**

**(Dr.M.Arulappan to second the same)**

10.00 The Board of Studies in **Philosophy** at its meeting held on 10.01.2024 passed the following resolutions.

10.01 Accordingly, these are placed before the Academic Council for approval.

10.02 **Dr.M.Arulappan**, Chairperson, Board of Studies in Philosophy, will move:

10.03 That the recommendation of the Board of Studies to introduce **Core – 7: Philosophy of Knowledge: Contemporary Approach, Core – 10: Moral Philosophy, Skill Based Elective – 1: Applied Psychology and Self Learning Course 5 : Natural Theology : Classical Perspectives** in semester V and **Core – 14: Metaphysics: Contemporary Issues, Skill Based Elective-2: Applied Aesthetics and Self Learning Course-6: Natural Theology : Contemporary Perspectives** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.119)**

10.04 That the recommendation of the Board of Studies to modify **Core 8: General Metaphysics, Core 9: Philosophy of God and Religion** and **Core 11: Postmodern Philosophy** in Semester V and **Core 12: Modern and Contemporary Indian Thought, Core 13: Philosophical Anthropology** and **Core 16: Comprehensive Understanding of Philosophy** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved.

10.05 That the recommendation of the Board of Studies to introduce new Value Added Courses titled **Basics of Latin** and **Theodicy** in ODD Semester **Symbolic Logic** and

**Textual Study : Summa Contra Gentiles** in Even Semester for UG and PG programme and to introduce the same for the students who have joined from the academic year 2023-24 onwards, be ratified. **(P.No.164)**

**(Mr.J.Robert Dhiliban to second the same)**

11.00 The Board of Studies in **Mathematics** at its meeting held on 10.01.2024 passed the following resolutions.

11.01 Accordingly, these are placed before the Academic Council for approval.

11.02 **Mr.J.Robert Dhiliban**, Chairperson, Board of Studies in Mathematics, will move:

11.03 That the recommendation of the Board of Studies to introduce **Core-9: Numerical Methods using Computer Applications, Core Lab 1: Numerical Methods using C++, Core Elective-1(a): Number Theory** and **Core Elective 1(b): Elements of Topology** in Semester V and **Core-14: Industrial Optimization Techniques, Core Elective -2(b): R Programming (Theory & Practical)**, in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.172)**

11.04 That the recommendation of the Board of Studies to modify **Core -7: Modern Algebra, Core-8: Real Analysis** and **Core-10: Operations Research**, in Semester V and **Core-12: Complex Analysis, Core-13: Graph Theory** and **Core Elective -2(a): Java Programming (Theory & Practical)** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved.

11.05 That the recommendation of the Board of studies to introduce new Value Added Courses titled **Data Analysis Using R, Introduction to SPSS** and **Graphing and Computations with Geogebra** in Odd Semester and **Introduction to LaTeX, Data Analysis using SPSS** and **Forensic Mathematics** in Even semester of the UG & PG Programme and to introduce the same for the students who joined from June 2023 onwards, be ratified.**(P.No.213)**

**(Dr.A.Shanmugaraju to second the same)**

12.00 The Board of Studies in **Physics** at its meeting held on 10.01.2024 passed the following resolutions.

12.01 Accordingly, these are placed before the Academic Council for approval.

12.02 **Dr.A.Shanmugaraju**, Chairperson, Board of Studies in Physics, will move:

- 12.03 That the recommendation of the Board of Studies to introduce **Core Elective-2 (c): Optoelectronics** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No. 225)**
- 12.04 That the recommendation of the Board of Studies to Modify Core, Core Lab, Core Electives and Self Learning Courses in Semester V & VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved.
- 12.05 That the recommendation of the Board of Studies to Introduce New Value Added Courses titled **Mobile Phone Hardware Technician** in Odd semester and **Mobile Phone Software Technician** in Even semester in collaboration with E-Careerpluz, Madurai, in Semester V and to introduce **House Wiring** and **Servicing of Electrical Appliances** in both Odd and Even semester in collaboration with Loyola Technical Institute, Madurai, in semester VI of the UG & PG Programme and to introduce the same for the students who join from the academic year 2023-24 onwards, be ratified. **(P.No.283)**

**(Dr.N.Savitha Devi to second the same)**

- 13.00 The Board of Studies in **Chemistry** at its meeting held on 10.01.2024 passed the following resolutions.
- 13.01 Accordingly, these are placed before the Academic Council for approval.
- 13.02 **Dr.N.Savitha Devi**, Chairperson, Board of Studies in Chemistry, will move:
- 13.03 That the recommendation of the Board of Studies to introduce **Core Elective-1 (b): Analytical Chemistry, Core Elective 1(c): Polymer Chemistry** and **Core Elective-1(d): Soil Chemistry** in semester V and **Core Elective 2 (b): Pharmaceutical Chemistry, Core Elective -2 (c): Environmental Chemistry** and **Core Elective-2 (d): Nutritional Chemistry** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.292)**
- 13.04 That the recommendation of the Board of Studies to Modify Core, Core Lab, Core Elective 1 (a): Medicinal Chemistry and Core Elective 2 (a): Industrial Chemistry and Self Learning Courses in Semesters V & VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved.

13.05 That the recommendation of the Board of Studies to introduce new Value Added Courses titled **Nutritional Biochemistry** in Odd Semester and **Clinical Nutrition and Dietetics** in Even Semester of the UG & PG Programme and to introduce the same for the students who joined from June 2023 onwards, be ratified. **(P.No.352)**

**(Dr.M.Pandeeswari to second the same)**

14.00 The Board of Studies in **Rural Development Science** at its meeting held on 10.01.2024 passed the following resolutions.

14.01 Accordingly, these are placed before the Academic Council for approval.

14.02 **Dr.M.Pandeeswari**, Chairperson, Board of Studies in RDS, will move:

14.03 That the recommendation of the Board of Studies to Modify Core, Core Electives and Self Learning Courses in semester V & VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.358)**

14.04 That the recommendation of the Board of Studies to introduce New Curriculum Structure by incorporating Part I Tamil in III & IV semesters of the UG programme and to introduce the same for the students who joined from June 2023 onwards, be approved. **(P.No.400)**

**(Ms.E.Krithika to second the same)**

15.00 The Board of Studies in **Food Science & Technology** at its meeting held on 10.01.2024 passed the following resolutions.

15.01 Accordingly, these are placed before the Academic Council for approval.

15.02 **Ms.E.Krithika**, Chairperson, Board of Studies in Food Science & Technology, will move:

15.03 That the recommendation of the Board of Studies to introduce **Core-12: Research Methodology and Statistics, Core Elective-1 (b): Food Laws and Regulations** and **Self Learning Courses : Food Safety** in Semester V and **Core-16: Food Beverage Technology, Core Lab-8: Food Beverage Technology, Core Elective-2(a): Food Product Development and Marketing** and **Core Elective-2(b): Food Packaging and Labelling** in Semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.403)**

15.04 That the recommendation of the Board of Studies to Modify **Core-11: Technology of Meat and Poultry, Core Lab-V: Technology of Meat and Poultry, Core-13: Food Quality Testing and Evaluation** and **Core Lab:6 Food Quality Testing and**

**Evaluation** in Semester V and **Core-14: Technology of Sea Foods, Core Lab-VII: Technology of Sea Foods** and **Core-15: Project Management and Entrepreneurship** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved.

15.05 That the recommendation of the Board of Studies to introduce New Curriculum Structure by incorporating Part I Tamil in III & IV semesters of the UG programme and to introduce the same for the students who joined from June 2023 onwards, be approved. **(P.No.445)**

**(Ms.S.Jegadeeswari to second the same)**

16.00 The Board of Studies in **Tamil Literature** at its meeting held on 10.01.2024 passed the following resolutions.

16.01 Accordingly, these are placed before the Academic Council for approval.

16.02 **Ms.S.Jegadeeswari**, Chairperson, Board of Studies in Tamil Literature, will move:

16.03 2022-23 ஆம் கல்வி ஆண்டு முதல் கல்லூரியில் சேர்ந்து பயிலும் மாணவர்களுக்கான மூன்றாம் ஆண்டு தமிழ்ப் பாடத்திட்டத்திற்கு தமிழ்பாடத்திட்டக்குழு மாற்றங்கள் செய்ய பரிந்துரைத்த ஐந்தாம் பருவத் தாள்களாகிய **Core-7: காப்பிய இலக்கியம்**, **Core-8: இலக்கணம்-புறப்பொருள்-புறப்பொருள் வெண்பாமாலை**, **Core-11: நாடகக்கலையும் திரைப்படக்கலையும்** மற்றும் ஆறாம் பருவத் தாள்களாகிய **Core-12: சங்க இலக்கியமும்**, **அறஇலக்கியமும்**, **Core-15: பயன்பாட்டுத் தமிழ்** ஆகியவற்றிற்குப் ஒப்புதல் பெறுதல். **(P.No.448)**

16.04 2023-24 ஆம் கல்வி ஆண்டு முதல் தகுதி மேம்பாட்டுக் கல்வியில், ஒற்றை இலக்கப் பருவத்தில், புதிதாக அறிமுகப்படுத்தும் தாள்களான **போட்டித் தேர்வுத்தமிழ்-I**, **கனிணி பயன்பாட்டுத்தமிழ்** மற்றும் இரட்டை இலக்கப்பருவத்தில் புதிதாக அறிமுகப்படுத்தும் தாள்களான **போட்டித் தேர்வுத்தமிழ்-II**, **இதழியல்** ஆகியவற்றுக்கு அங்கீகாரம் பெறுதல். **(P.No.490)**

**(Dr.P.Veerasingam to second the same)**

17.00 The Board of Studies in **English Literature** at its meetings held on 10.01.2024 passed the following resolutions.

17.01 Accordingly, these are placed before the Academic Council for approval.

17.02 **Dr.P.Veerasingam** Chairperson, Board of Studies in English Literature, will move:

17.03 That the recommendation of the Board of Studies to modify Core and Self Learning Courses in semester V & VI of the UG Programme and to introduce the

same for the students who joined from June 2022 onwards, be approved.  
**(P.No.501)**

17.04 That the recommendation of the Board of Studies to introduce new Value Added Courses titled **English through LSRW** and **Film Appreciation** in Odd Semester and **English Grammar: Basics, Advanced Communication Skills** and **Presentation Skills** in Even Semester of the UG & PG Programme and to introduce the same for the students who joined from June 2023 onwards, be ratified. **(P.No.531)**

**(Mr.A.Stephen Jeyaraj to second the same)**

18.00 The Board of Studies in **Commerce with Computer Applications** at its meetings held on 10.01.2024 passed the following resolutions.

18.01 Accordingly, these are placed before the Academic Council for approval.

18.02 **Mr.A.Stephen Jeyaraj**, Chairperson, Board of Studies in Commerce, will move:

18.03 That the recommendation of the Board of Studies to introduce **Core Elective-1(c): Portfolio Management** in semester V and **Core Elective-2(b): Advertising and Salesmanship** and **Core Elective-2(c): Services Marketing** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.543)**

18.04 That the recommendation of the Board of Studies to modify Core, Core Lab, Core Electives and Self Learning Courses in Semesters V & VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved.

18.05 That the recommendation of the Board of Studies to introduce New Curriculum Structure by incorporating Part I Tamil in III & IV semesters of the UG programme and to introduce the same for the students who joined from June 2023 onwards, be approved. **(P.No.586)**

18.06 That the recommendation of the Board of Studies to introduce value added course titled **Advanced Excel, Tally** and **Investment Management** in Odd Semester and **Digital Marketing, Brand Management, Modern Banking** and **Principles of Insurance** in Even Semester of UG & PG programme and to introduce the same for the students who joined from June 2023 onwards, be ratified. **(P.No.589)**

**(Dr.V.Nirmal Rajkumar to second the same)**

19.00 The Board of Studies in **Commerce** at its meeting held on 10.01.2024 passed the following resolutions.

- 19.01 Accordingly, these are placed before the Academic Council for approval.
- 19.02 **Mr.A.Stephen Jeyaraj**, Chairperson, Board of Studies in Commerce, will move:
- 19.03 That the recommendation of the Board of Studies to introduce Core, Core Elective and Self Learning Courses in Semesters V & VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.604)**
- 19.04 That the recommendation of the Board of Studies to introduce New Curriculum Structure by incorporating Part I Tamil in III & IV semesters of the UG programme and to introduce the same for the students who joined from June 2023 onwards, be approved. **(P.No.645)**

**(Dr.P.Jerlin Rupa to second the same)**

- 20.00 The Board of Studies in **Business Administration** at its meeting held on 10.01.2024 passed the following resolutions.
- 20.01 Accordingly, these are placed before the Academic Council for approval.
- 20.02 **Dr.P.Jerlin Rupa**, Chairperson, Board of Studies in Business Administration, will move:
- 20.03 That the recommendation of the Board of Studies to introduce **Core Elective-1(c): Digital and Social Media Marketing** in semester V and **Core Elective-2(c): Customer Relationship Management** and **Self Learning Course: Business Etiquette** in Semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.648)**
- 20.04 That the recommendation of the Board of Studies to modify Core and Core Electives in Semesters V & VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved.
- 20.05 That the recommendation of the Board of Studies to introduce New Curriculum Structure by incorporating Part I Tamil in III & IV semesters of the UG programme and to introduce the same for the students who joined from June 2023 onwards, be approved. **(P.No.694)**
- 20.06 That the recommendation of the Board of Studies to introduce new Value Added Course titled **Corporate Skills for Executives, Time Management, Digital Marketing** in Odd Semester and **Outbound Training, Sports Administration and Management, Essentials of Leadership** in Even Semester of the UG & PG Programme and to introduce the same for the students who joined from June 2023 onwards, be ratified. **(P.No.698)**

**(Dr.S.Arun Prasad to second the same)**

- 21.00 The Board of Studies in **Information Technology & Management** at its meeting held on 10.01.2024 passed the following resolutions.
- 21.01 Accordingly, these are placed before the Academic Council for approval.
- 21.02 **Dr.S.Arun Prasad**, Chairperson, Board of Studies in IT&M, will move:
- 21.03 That the recommendation of the Board of Studies to introduce **Core Elective– 2 Internet of Things** in Semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.711)**
- 21.04 That the recommendation of the Board of Studies to modify Core, Core Lab, Core Elective-1 in semester V and **Core-15: Advertising and Salesmanship** and **Core-16: Entrepreneurship Development** in Semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved.
- 21.05 That the recommendation of the Board of Studies to introduce New Curriculum Structure by incorporating Part I Tamil in III & IV semesters of the UG programme and to introduce the same for the students who joined from June 2023 onwards, be approved. **(P.No.747)**
- 21.06 That the recommendation of the Board of Studies to introduce new Value Added Courses **Office Application Suite** in Odd Semester and **Managerial Skills for Leaders** in Even Semester of the UG & PG programme and to introduce the same for the students who joined from June 2023 onwards, be ratified. **(P.No.750)**

**(Mr.R.Justin Kennedy to second the same)**

- 22.00 The Board of Studies in **Information Technology** at its meeting held on 10.01.2024 passed the following resolutions.
- 22.01 Accordingly, these are placed before the Academic Council for approval.
- 22.02 **Dr.S.Arun Prasad**, Chairperson, Board of Studies in IT, will move:
- 22.03 That the recommendation of the Board of Studies to introduce New Curriculum Structure of the UG programme and to introduce the same for the students who joined from June 2024 onwards, be approved. **(P.No.754)**
- 22.04 That the recommendation of the Board of Studies to introduce Core, Core Lab, Allied in Semester I & II of the UG Programme and to introduce the same for the students who join from June 2024 onwards, be approved.

**(Dr.N.Veeraparameswari to second the same)**

- 23.00 The Board of Studies in **Physical Education** at its meeting held on 10.01.2024 passed the following resolutions.
- 23.01 Accordingly, these are placed before the Academic Council for approval.
- 23.02 **Dr.N.Veeraparameswari**, Chairperson, Board of Studies in Physical Education, will move:
- 23.03 That the recommendation of the Board of Studies to introduce **Core Elective-1(b): Sports Journalism** and **Self Learning Course : Olympic Movement** in Semester V and Core XI: **Sports Management** and **Self Learning Course: Sports Nutrition** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.775)**
- 23.04 That the recommendation of the Board of Studies to modify **Core-6: Science of Sports Training**, **Core-7: Methods in Physical Education**, **Core-8: Test, Measurement and Evaluation in Physical Education (Theory & Practical)** and **Core Elective-1(a): Exercise Physiology** in semester V and **Core-10: Kinesiology and Biomechanics in Physical Education**, **Core-12: Games of Specialization** and **Core Elective-2(a): Sports Medicine and First Aid** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved.
- 23.05 That the recommendation of the Board of Studies to introduce new Value Added Course titled **Exercise Therapy** in Odd semester and **Training Methods in Sports and Games** in Even semester of the UG & PG Programme and to introduce the same for the students who joined from June 2023 onwards, be ratified. **(P.No.820)**

**(Ms.I.Juliet Shanthi to second the same)**

- 24.00 The Board of Studies in **Computer Science** at its meeting held on 10.01.2024 passed the following resolutions.
- 24.01 Accordingly, these are placed before the Academic Council for approval.
- 24.02 **Ms.I.Juliet Shanthi**, Chairperson, Board of Studies in Computer Science, will move:
- 24.03 That the recommendation of the Board of Studies to Introduce **Core-11: Big Data Analytics using R**, **Core Elective-1** and **Self Learning Course** in Semester V and **Core-18: Python Programming**, **Core Elective-2** and **Self Learning Course** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.824)**

- 24.04 That the recommendation of the Board of Studies to modify **Core-12: Mobile Computing, Core-13: Dot Net Programming, Core-14: Network Security and Cryptography** and **Core Lab-5: Dot Net Programming** in Semester V and **Core-15: Software Engineering** and **Core-16: Data Mining and Warehousing** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved.
- 24.05 That the recommendation of the Board of Studies to introduce New Curriculum Structure by incorporating Part I Tamil in III & IV semesters of the UG programme and to introduce the same for the students who joined from June 2023 onwards, be approved. **(P.No.868)**
- 24.06 That the recommendation of the Board of Studies to introduce the new curriculum structure for Computer Science of the PG Programme and to introduce the same for the students who join from June 2024 onwards, be approved. **(P.No.871)**
- 24.07 That the recommendation of the Board of Studies to introduce the new syllabus for Computer Science in Semesters I & II of the PG Programme and to introduce the same for the students who join from June 2024 onwards, be approved.
- 24.08 That the recommendation of the Board of Studies to introduce new Value Added Course titled **Image Editing and Video Making, Responsive Web Development and Hardware and Networking** in Odd Semester **Data Analysis Tool, IoT and its Applications** and **Python Programming** in Even Semester of the UG & PG Programme and to introduce the same for the students who joined from June 2023 onwards, be ratified. **(P.No.903)**

**(Dr.S.Valanarasu to second the same)**

- 25.00 The Board of Studies in **Computer Applications** at its meeting held on 10.01.2024 passed the following resolutions.
- 25.01 Accordingly, these are placed before the Academic Council for approval.
- 25.02 **Ms.I.Juliet Shanthi**, Chairperson, Board of Studies in Computer Applications, will move:
- 25.03 That the recommendation of the Board of Studies to introduce Core, Core Lab, Allied, Non-Major Electives and Self Learning Courses in Semesters III & IV of the UG Programme and to introduce the same for the students who joined from June 2023 onwards, be approved. **(P.No.914)**

25.04 That the recommendation of the Board of Studies to introduce New Curriculum Structure of the PG Programme (MCA) and to introduce the same for the students who joined from June 2023 onwards, be ratified. **(P.No.951)**

25.05 That the recommendation of the Board of Studies to introduce Core, Core Lab and Core Elective in Semesters I & II of the PG Programme (MCA) and to introduce the same for the students who joined from June 2023 onwards, be ratified.

25.06 That the recommendation of the Board of Studies to introduce Core, Core Lab, Core Elective in Semesters III & IV of the PG Programme (MCA) and to introduce the same for the students who joined from June 2023 onwards, be approved.

**(Rev.Dr.Sekar B. Vincent, SJ to second the same)**

26.00 **Rev.Dr.Sekar B. Vincent, SJ**, Chairperson, Human Excellence, will move:

26.01 That the recommendation of the Board of Studies to introduce the course titled **Soft Skill-I** in Semester V and **Soft Skill-II** in semester VI of the UG Programme and to introduce the same for the students who joined from June 2022 onwards, be approved. **(P.No.1006)**

**(Dr.A.Sundararaj to second the same)**

27.00 Concluding Remarks : **Rev. Dr. M. Anbarasu, S.J.,**

Principal and Chairperson, Academic Council.

28.0.0 Concluding Prayer : **Dr.P.Arockia Juliet**

Vice Principal (Shift II)

**PRINCIPAL & CHAIRPERSON  
ACADEMIC COUNCIL**



**MINUTES OF THE PREVIOUS  
ACADEMIC COUNCIL MEETING  
held on 2<sup>nd</sup> March, 2023**



**MINUTES**  
**MEETING OF THE ACADEMIC COUNCIL, 2<sup>nd</sup> March (Thursday), 2023**

1.0.0 **Preliminaries:** The Meeting of the Academic Council was held in Fr Prince Hall on 02.03.2023 at 10.30 am. Rev.Dr.Godwin Rufus, SJ, Principal & Chairperson of Academic Council presided over the meeting and Dr.A.Shanmugaraju, Dean for Academic Affairs recorded the proceedings. Dr.T.Kala, Head, Dept. of History, invoked the blessings of God.

**MEMBERS PRESENT**

<b>S.No.</b>	<b>Name of the Member</b>	<b>Office / Department</b>
1.	Rev.Dr.Godwin Rufus, SJ	Principal & Chairperson
2.	Dr.A.Shanmugaraju	Dean for Academic Affairs & Convenor
3.	Dr.R.Meenakshi MKU Nominee	Assistant Professor & Head i/c Department of Education School of Education Madurai Kamaraj University Madurai- 625 021.
4.	Dr.B.Sivakumar MKU Nominee	Assistant Professor Department of Applied Mathematics & Statistics School of Mathematics Madurai Kamaraj University Madurai – 625 021.
5.	Dr.R.Nimma Elizabeth GB Nominee	Associate Professor & Head Dean of Academic Affairs Lady Doak College Madurai – 625002.
6.	Dr.R.Albert Christopher Dhas GB Nominee	Director Management Courses The American College Madurai – 625002.
7.	Dr.A.Sundararaj	Deputy Principal
8.	Rev.Dr.M.Anbarasu, SJ	Vice Principal (Shift I)
9.	Dr.A.Duraisingam	Vice Principal (Shift I)
10.	Rev.Fr.S.Jayaseelan, SJ	Vice Principal (Shift II)

11.	Mr.R.Justin Kennedy	Vice Principal (Shift II)
12.	Dr.I.Pradeepa	Vice Principal (Shift II)
13.	Dr.S.Arul Prasad	Controller of Examinations
14.	Dr.S.Valanarasu	Coordinator-IQAC
15.	Dr.A.Joseph Charlie Arockia Doss	Tamil
16.	Dr.S.Jesurajan	English
17.	Dr.T.Kala	History
18.	Dr.I.Jeyaraj	Economics
19.	Dr.M.George Joseph	Philosophy
20.	Dr.J.Xavier Adaikalaraj	Mathematics
21.	Dr.K.S.Joseph Wilson	Physics
22.	Dr.S.Rayappan	Chemistry
23.	Dr.Ambudoss Arvind	RDS
24.	Ms.P.Revathi	Food Science & Technology
25.	Dr.M.Karunanidhi	Tamil Literature
26.	Dr.P.Veerasamy	English Literature
27.	Mr.A.Stephen Jeyaraj	Commerce
28.	Dr.P.Jerlin Rupa	Business Administration
29.	Dr.Dr.S.Arun Prasad	I.T. & Management
30.	Dr.N.Veeraparameswari	Physical Education
31.	Ms.I.Juliet Shanthi	Computer Science & Application
32.	Rev.Dr.Vincent Sekhar, SJ	Human Excellence
33.	Dr.G.Gurusamy	Dean-Student, Extension

#### Members absent with apology

S.No.	Name of the Member	Office / Department
1.	Rev.Dr.John Pragasam	Rector
2.	Rev.Dr.V.Gilburt Camillus, SJ	Secretary
3.	Dr.Ponmuthuramalingam	Joint Director of Collegiate Education Madurai Region Palam Station Road, Sellur Madurai – 625 002.

4.	Dr.K.Sadasivam MKU Nominee	Associate Professor & Head Department of Environmental Economics School of Economics Madurai Kamaraj University Madurai – 625 021.
5.	Dr.A.Ramanathan GB Nominee	Professor School of Agriculture & Animal Husbandry Gandhigram Rural Institute – Deemed to be University Gandhigram Dindigul – 625 302.
6.	Rev.Fr.Dr.R.Essac	Principal Anugraha College Nochoidaipatty, Dindigul.
7.	Mr.L.Ahamed Riyaz	Manager HR HCL Technologies ELCOT IT Park Near Pandi Kovil Madurai – 625 020.
8.	Dr.S.P.Malarkannan	Dean-Research Arul Anandar College Karumathur – 625 514

2.0.0 **Rev.Dr.Godwin Rufus, SJ**, Principal and Chairperson welcomed the members. He stressed for accountability among all stake holders in Curriculum Development as it is the back bone of an Autonomous College. He also expressed that constant up-gradation of the syllabi with contemporary developments and skills for employability are crucial for the growth of students. He requested the external members to provide proper guidance regarding the implementation of TANSCHÉ Curriculum as there was confusion at present.

2.0.1 **Dr.B.Sivakumar**, MKU Nominee suggested to follow the TANSCHÉ guidelines as it was implemented by the Government of Tamil Nadu.

2.0.2 **Dr.A.Shanmugaraju**, Dean for Academic Affairs responded that TANSCHÉ has not released proper syllabi and the guidelines are too vague.

- 2.0.3 **Dr.R.Meenakshi**, MKU Nominee informed that Madurai Kamaraj University is awaiting proper guidelines from TANSCHÉ. The information will be informed to the affiliated colleges once the guidelines are received by the University.
- 2.0.4 **Dr.A.Sundararaj**, Deputy Principal expressed his concern of losing the Autonomy by Autonomous Colleges.
- 2.0.5 **Dr.B.Sivakumar** informed that Autonomous Colleges can have changes to the tune of 25% in non-mandatory courses.
- 3.0.0 **Dr.A.Shanmugaraju**, Dean for Academic Affairs presented the minutes of the Academic Council held on 16<sup>th</sup> March 2022.
- 3.0.1 The minutes was passed without any amendment.
- 3.0.2 **Dr.A.Shanmugaraju** also moved the following resolutions.
- 3.0.3 That the recommendations to revise syllabi in OBE Format of III & IV semesters for the UG programme from the academic year 2023, be approved.
- 3.0.4 That the recommendations to revise syllabi in OBE Format of III & IV semesters of the PG programme from the academic year 2023, be approved.
- 3.0.5 That the recommendation to introduce the New Structure of UG & PG programme based on the guidelines given by TANSCHÉ and to introduce the same for the students who join from June 2023 onwards, be approved.
- 3.0.6 That the recommendation to introduce New Courses BCA - Computer Application and M.Sc. Computer Science and to introduce from the academic year 2023-24, be approved.
- 3.0.7 **Dr.S.Arul Prasad**, Controller of Examinations requested to analyse the possibilities of incorporating Nan Mudalvan courses in the curriculum.
- 3.0.8 **Dr.A.Shanmugaraju**, Dean for Academic Affairs replied that this aspect can be discussed while TANSCHÉ sent proper guidelines.
- 3.0.9 **Dr.S.Arul Prasad**, the Controller of Examinations, seconded the same. The above recommendations were passed without amendments.
- 4.0.0 Business brought forward by the Controller of Examinations.
- 4.0.1 **Dr.S.Arul Prasad** the Controller of Examinations, moved the following resolutions:
- 4.0.2 That the appointment of question paper setters and examiners for November 2022, and April 2023, be approved.
- 4.0.3 That the publication of results of all the examinations held in April 2022 and November 2022, be approved.
- 4.0.4 **Dr.A.Joseph Charlie Arockia Doss** seconded the same and the resolutions were approved without amendments.

- 5.0.0 Business brought forward by the Chairperson of various board of studies.
- 6.0.0 **Dr.A.Joseph Charlie Arockia Doss**, Chairperson, Board of Studies in Tamil moved the following resolutions.
- 6.0.1 2022-23 ஆம் கல்வியாண்டிலிருந்து பட்ட வகுப்பு பகுதி-1 (தமிழ் ஈராண்டு படிக்கும் மாணவர்களுக்கு) மூன்றாம் பருவம் காப்பியத்தமிழ் மற்றும் நான்காம் பருவம் சங்கத்தமிழ் மற்றும் பகுதி-4 அடிப்படைத்தமிழ்-1, அடிப்படைத்தமிழ்-2, சிறப்புத்தமிழ்-1, மற்றும் சிறப்புத்தமிழ்-2 ஆகிய தாள்களுக்குரிய புதிய பாடவரையறைகளை அறிமுகப்படுத்துவது என்ற தீர்மானத்திற்கு ஒப்புதல் பெறுதல்.
- 6.0.2 Dr.S.Jesurajan seconded the same
- 6.0.3 **Dr.R.Albert Christopher Dhas**, GB Nominee enquired about the summative examination pattern for Adippadi Tamil and Sirappu Tamil.
- 6.0.4 **Dr.A.Joseph Charlies Arockia Doss** responded that these two courses has different question pattern compared to other courses.
- 6.0.5 The resolutions were approved without amendments.
- 7.0.0 **Dr.S.Jesurajan**, Chairperson, Board of Studies in English moved the following resolutions.
- 7.0.1 That the recommendation of the Board of Studies to abolish streams in Part II English in Semester III & IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 7.0.2 That the recommendation of the Board of Studies to revise Part II English in Semester III & IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 7.0.3 Dr.T.Kala, seconded the same.
- 7.0.4 **Dr.R.Nimma Elizebath** sought clarification on the reason for abolishing streams in second year only.
- 7.0.5 **Dr.S.Jesurajan** replied that after one year the stream-B students should be empowered to be in par with Stream-A students.
- 7.0.6 The resolutions were approved without amendments.
- 8.0.0 **Dr.T.Kala**, Chairperson, Board of Studies in History moved the following resolutions.
- 8.0.1 That the recommendation of the Board of Studies for a slight modification in **Core – 5 : History of India II (from 712 to 1707 AD), Allied-3 : Social History of India, Core Elective – 1 : History of Tamil Nadu (upto 1336 AD) and Non-Major Elective-1 : History of Freedom Struggle in India** in Semester III of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 8.0.2 That the recommendation of the Board of Studies to revise **Core 6 : History of India III (1707 AD to 1857 AD)** and **Core Elective-2 : History of Tamil Nadu II (1529 to present**

- day)** in semester IV of the UG Programme, and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 8.0.3 Dr.I.Jeyaraj seconded the same.
- 8.0.4 **Fr. Principal** suggested to correct certain typographical error in the course History of India (from 712 AD to 1707 AD).
- 8.0.5 The resolutions were approved without amendments.
- 9.0.0 **Dr.I.Jeyaraj**, Chairperson, Board of Studies in Economics moved the following resolutions.
- 9.0.1 That the recommendation of the Board of Studies to revise the courses in Core, Core Elective, Non-Major Elective and Self Learning Courses in Semesters III & IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 9.0.2 That the recommendation of the Board of Studies to modify the existing syllabus for the Allied Papers in semester III & IV of the UG Programme, be approved.
- 9.0.3 That the recommendation of the Board of Studies to introduce the Value Added Courses on **Logistics Supply and Chain Management** in Semester III and **Sales Planning and Budgeting** in Semester IV of the UG Programme and to introduce the same for the students who joined in June 2023 onwards, be approved.
- 9.0.4 That the recommendation of the Board of Studies to continue with the existing syllabus of the PG Programme, be approved.
- 9.0.5 **Dr.M.George Joseph** seconded the same.
- 9.0.6 **Dr.R.Albert Christopher Dhas** suggested to replace the course Banking with Banking and Financial Market.
- 9.0.7 **Dr.A.Shanmugaraju** requested the Head to rearrange the structure of Value added Courses.
- 9.0.8 After discussions the resolutions were approved with amendments.
- 10.0.0 **Dr.M.George Joseph**, Chairperson, Board of Studies in Philosophy moved the following resolutions.
- 10.0.1 **Dr.M.George Joseph**, Chairperson, Board of Studies in Philosophy, moved the following resolutions.
- 10.0.2 That the recommendation of the Board of Studies for the modification of the Curricular Structure of the UG Programme and to introduce the same for the students who joined in the year 2022-23 and onwards be ratified.
- 10.0.3 That the recommendation of the Board of Studies to revise **Core – 5: Western Philosophy: Modern** in Semester III and to introduce new **Core Elective–1b:**

- Introduction to Islamic Philosophy, Core Elective – 2a: Eco-Philosophy, Core Elective – 2b: Philosophy of Knowledge: Classical Approach and Non-Major Elective – 2: Philosophy for Competitive Examinations** in semesters III & IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 10.0.4 That the recommendation of the Board of Studies to revise **Core-9: Cosmology and Philosophy of Science, Core – 10: Philosophy of Knowledge** and **Core – 14: Aesthetics** and to introduce new **Core Elective–3a: Philosophical Classic: The Republic, Core Elective–3b:Philosophical Classic: Philosophical Investigations** and **Core Elective–4b:Gandhian Philosophy** in Semesters III & IV of the PG Programme for the students who joined in June 2022 onwards, be approved.
- 10.0.5 That the recommendation of the Board of Studies to introduce **Allied – 2: Ethics and its Social Dimensions** in Semester II of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be ratified.
- 10.0.6 That the recommendation of the Board of Studies to introduce one more **Core Elective 1b: Advanced Social Psychology** in Semester I and **Core Elective 2b: Process Philosophy** in Semester II of the PG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 10.0.7 Dr.J.Xavier Adaikalaraj seconded the same and the resolutions were approved without amendments.
- 11.0.0 **Dr.J.Xavier Adaikalaraj**, Chairperson, Board of Studies in Mathematics moved the following resolutions.
- 11.0.1That the recommendation of the Board of Studies to revise **Core-5: Sequences and Series, Allied-3: Analytical Geometry of 3D & Vector Calculus** and **Non-Major Elective-1: Mathematics for Competitive Examinations** in Semester III and **Core-6: Mechanics** and **Allied-4: Differential Equations and Applications** in semester IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 11.0.2 That the recommendation of the Board of Studies to revise and change the title of **Non-Major Elective-2: Operation Research Techniques to Resource Optimization Techniques** in Semester IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 11.0.3 That the recommendation of the Board of studies to revise **Core-8: Topology, Core-9: Classical Mechanics Core-11: Operations Research** and **Core Elective-3a: Mathematical Modeling** and to introduce **Core Elective-3b:Calculus of Variations** in semester III of the

- PG Programme and to offer the same for the students who joined in June 2022 onwards, be approved.
- 11.0.4 That the recommendation of the Board of studies to revise **Core 12: Functional Analysis**, **Core 13: Fuzzy Sets and Applications** and Core Elective-4a:**Automata Theory** and to introduce **Core Elective-4b: Fluid Dynamics** in semester IV of the PG Programme and to offer the same for the students who joined in June 2022 onwards, be approved.
- 11.0.5 Dr.K.S.Joseph Wilson seconded the same.
- 11.0.6 **Dr.B.Sivakumar** recommended the Head to change the title of the course Calculus of Variation with Intergral Variation.
- 11.0.7 **Dr.R.Albert Christopher Dhas** suggested to maintain the course title of Operations Research as Resource Optimization Techniques.
- 11.0.8 After the discussions the resolutions were approved without amendments.
- 12.0.0 **Dr.K.S.Joseph Wilson**, Chairperson, Board of Studies in Physics moved the following resolutions.
- 12.0.1 That the recommendation of the Board of Studies to revise **Non-Major Elective-1: Popular Physics**, **Non-Major Elective-2: Basics of Applied Physics** and **Allied Physics I & Allied Physics II** in Semesters III & IV and to introduce **Core-4: Heat & Thermodynamics** in semester IV of the UG Programme and to offer the same for the students who joined in June 2022 onwards, be approved.
- 12.0.2 That the recommendation of the Board of Studies to introduce **Core Elective-3:Thermodynamics and Statistical Physics** and to revise and introduce **Microprocessor and Microcontroller** instead of **Microprocessor** in Semester III of the PG Programme for the students who joined in June 2022 onwards, be approved.
- 12.0.3 Dr.S.Rayappan seconded the same.
- 12.0.4 Dr.Nimma Elizebath appreciated the Department to have the course **Space Physics**. She also suggested to sign MoU with Government Hospital for Practical in Medical Physics.
- 12.0.5 Dr.K.S.Joseph Wilson replied that the students regularly visit Kodaikanal Solar Observatory for Practical in Space Physics. He also informed that the Department will try to sign MoUs with Hospitals in Madurai for Practical in Medical Physics.
- 12.0.6 After the discussions the resolutions were approved with amendments.
- 13.0.0 **Dr.S.Rayappan**, Chairperson, Board of Studies in Chemistry moved the following resolutions.
- 13.0.1 That the recommendation of the Board of Studies to revise Core, Allied, Core Lab, Allied Lab and Self Learning Courses in Semesters III & IV of the UG Programme and to offer the same for the students who joined in June 2022 onwards, be approved.

- 13.0.2 That the recommendation of the Board of Studies to introduce **NME-2: Applied Chemistry** in the place of **Chemistry for Life and Living** in semester IV of the UG Programme and to offer the same for the students who joined in June 2022 onwards, be approved.
- 13.0.3 That the recommendation of the Board of Studies to revise Core, Core Elective, in Semesters III & IV of the PG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 13.0.4 That the recommendation of the Board of Studies to change nomenclature of **Core-8: Chemistry of Natural Products** to **Natural Products** and moved a paper on **Core-7: Research Methodology** in the place of **Core Elective-3 : Applications of Spectroscopy**, and moved a paper on **Core Elective-3 : Applications of Spectroscopy** in the place of **Core-7: Research Methodology** in Semester III of the PG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 13.0.5 That the recommendation of the Board of Studies to change nomenclature of **Core-12: Chemical Kinetics, Surface Chemistry & Cheminformatics** into **Chemical Kinetics, Surface & Polymer Chemistry** in Semester IV of the PG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 13.0.6 Dr.Ambudoss Arvind seconded the same and the resolutions were approved without amendments.
- 14.0.0 **Dr.Ambudoss Arvind**, Chairperson, Board of Studies in RDS moved the following resolutions.
- 14.0.1 That the recommendation of the Board of Studies to continue with the existing syllabus of the II year UG Programme, be approved.
- 14.0.2 That the recommendation of the Board of Studies to introduce **Core Elective-4: Dairy Business Management** in the place of **IRD Practical** in Semester IV of the PG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 14.0.3 That the recommendation of the Board of Studies to introduce the Value Added Courses on **Herbal Medicine** in Semester III and **Ornamental Fish Culture** in Semester IV of the UG Programme and to introduce the same for the students who joined in June 2023 onwards, be approved.
- 14.0.4 Ms.P.Revathi seconded the same.
- 14.0.5 Dr.R.Albert Christopher Dhas suggested that there are errors in the calculation of mapping values.
- 14.0.6 Dr.Ambudoss Arvind replied that necessary corrections will be made.
- 14.0.7 The resolutions were approved without amendments.

- 15.0.0 **Ms.P.Revathi**, Chairperson, Board of Studies in Food Science & Technology moved the following resolutions.
- 15.0.1 That the recommendation of the Board of Studies to revise courses in Core, Allied, Core Lab, Allied Lab and Non-Major Elective in Semesters III & IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 15.0.2 That the recommendation of the Board of Studies to introduce **Core-6: 'Technology of Cereal Grains, Pulses and Oilseeds'** in the place of **'Technology of Cereal, Pulses and Oilseeds'**, **Core-7: 'Food Safety and Toxicology'** in the place of **'Mathematical Statistics'** **Core Lab-3:'Food Engineering & Technology of Cereals Grains, Pulses and Oilseeds & Food Safety Lab'** in the place of **'Food Engineering & Technology of Cereals, Pulses and Oilseeds Lab'** in Semester III and to introduce **Non-Major Elective – 2 : 'Basics of Nutrition'** in the place of **'Basics of Food Science'** in semester IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 15.0.3 That the recommendation of the Board of Studies to introduce the Value Added Courses on **'Nutrition Through Life Cycle'** in Semester III and **'Dietetics'** in Semester IV of the UG Programme and to introduce the same for the students who joined in June 2023 onwards, be approved.
- 15.0.4 Mr.M.Karunanidhi, seconded the same and the resolutions were approved without amendments.
- 16.0.0 **Mr.M.Karunanidhi**, Chairperson, Board of Studies in Tamil Literature moved the following resolutions.
- 16.0.1 2022-23 ஆம் கல்வியாண்டிலிருந்து இரண்டாம் ஆண்டு தமிழ்ப் பட்ட வகுப்பு பயிலும் மாணவர்களுக்குத் தமிழ்பாடத்திட்டக்குழு பரிந்துரைத்த பகுதி-3 மற்றும் பகுதி-4 ஆகியவற்றுக்கான புதிய பாடவரையறைகளை அறிமுகப்படுத்துவது என்ற தீர்மானத்திற்கு ஒப்புதல் பெறுதல்.
- 16.0.2 Dr.P.Veerasingam seconded the same and the resolutions were approved without amendments.
- 17.0.0 **Dr.P.Veerasingam**, Chairperson, Board of Studies in English Literature moved the following resolutions.
- 17.0.1 That the recommendation of the Board of Studies to revise **Core-V: Indian Writing in English-I, Non-Major Elective-1: Business English** in Semester III and **Core-VI: Indian Writing in English-II, Allied-4: History of English Literature – II, Core Elective-II:British Fiction – II** and **Non-Major Elective-II: Creative Writing in English/English for Employability** in Semester IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.

- 17.0.2 That the recommendation of the Board of Studies to revise the syllabus in Core, Core Elective, Non-Major Elective in Semesters III & IV of the PG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 17.0.3 That the recommendation of the Board of Studies to introduce the syllabi for two new **Core Elective 3a: Academic Writing** in semester III and **Core Elective 4b: Content Writing** in semester IV of the PG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 17.0.4 Mr.A.Stephen Jeyaraj seconded the same and the resolutions were approved with amendments.
- 18.0.0 **Mr.A.Stephen Jeyaraj**, Chairperson, Board of Studies in Commerce with Computer Applications moved the following resolutions.
- 18.0.1 That the recommendation of the Board of Studies to revise courses in Core, Allied, Non-Major Electives and Skill Based Electives in Semesters III & IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 18.0.2 That the recommendation of the Board of Studies that **Corporate Accounting** is bifurcated into two as paper I & II; the paper **Corporate Accounting – I** is placed in semester III and **Corporate Accounting – II** is placed to replace **Management Accounting** in semester V of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 18.0.3 That the recommendation of the Board of Studies to modify the syllabi in Core and Core Elective in Semesters III & IV of the PG Programme (M.Com) and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 18.0.4 That the recommendation of the Board of Studies to introduce **Competitive Exam for Commerce** in the place of **Commerce for NET/SET** in Semester IV of the PG Programme (M.Com) and to introduce the same for the students who joined in June 2021 onwards, be ratified.
- 18.0.5 That the recommendation of the Board of Studies to introduce value added course on **Business Correspondence** in Semester II of the UG Programme and to introduce **Digital Marketing** in Semester II of the PG programme (M.Com) and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 18.0.6 Dr.G.Gurusamy seconded the same.
- 18.0.7 Dr.S.Arul Prasad suggested to incorporate new Labour Code in the Course Industrial laws and Labour Welfare of M.Com.
- 18.0.8 Mr.A.Stephen Jeyaraj accepted to incorporate it
- 18.0.9 After the discussions and the resolutions were approved with amendments.

- 19.0.0 **Mr.A.Stephen Jeyaraj**, Chairperson, Board of Studies in Commerce for the new programme B.Com moved the following resolution.
- 19.0.1 That the recommendation of the Board of Studies to propose New Courses in Core, Allied, Non-Major Electives and Skill Based Electives in Semesters III & IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 19.0.2 Dr.P.Jerlin Rupa seconded the same and the resolutions were approved without amendments.
- 20.0.1 **Dr.P.Jerlin Rupa**, Chairperson, Board of Studies in Business Administration moved the following resolutions.
- 20.0.2 That the recommendation of the Board of Studies to change nomenclature of the course Core-3 “**Environmental Management**” into “**Business Environmental Management**” in Semester II of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be ratified.
- 20.0.3 That the recommendation of the Board of Studies to revise courses in Core, Allied, Non-Major Electives and Skill Based Electives in Semesters III & IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 20.0.4 That the recommendation of the Board of Studies to introduce Value Added Course on **Time Management** in Semester II of the UG Programme and to introduce the same for the students who joined in June 2023 onwards, be approved.
- 20.0.5 Dr.S.Arun Prasad seconded the same and the resolutions were approved without amendments.
- 21.0.0 **Dr.S.Arun Prasad**, Chairperson, Board of Studies in IT&M moved the following resolution.
- 21.0.1 That the recommendation of the Board of Studies to revise **Core-5: Operating Systems, Allied-3:Business Accounting, Core-8: Organizational Behaviour** and **Skill Based Elective-2:Business Statistics** in Semester III of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved. **(P.No.598)**
- 21.0.2 That the recommendation of the Board of Studies to introduce new papers **Core-6: DBMS, Core-7:Web Technology, Core Lab-3: Programming in Web Technology, Core-9:Computer Network, Core-10:Dot Net Programming, Core Lab-4: Dot Net Programming, Allied-4:Web Marketing, Non-Major Elective-2: Ethical Hacker** in Semester IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 21.0.3 Dr.N.Veeraparameswari seconded the same.

- 21.0.4 Dr.B.Sivakumar suggested to change the course DBMS in to RDBMS.
- 21.0.5 Dr.Arun Prasad informed that the change will be adopted.
- 21.0.6 After the discussion the resolutions were approved with amendments.
- 22.0.0 **Dr.N.Veeraparameswari**, Chairperson, Board of Studies in Physical Education moved the following resolution.
- 22.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters III & IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved. **(P.No.637)**
- 22.0.2 That the recommendation of the Board of Studies to introduce **Non-Major Elective-1: Fitness and Wellness** in semester III **Non-Major Elective-2: Fundamentals of Yoga** in semester IV and **Self Learning Courses: Modern Trends in Physical Education** and **Health Education** in semesters III & IV of the UG Programme and to offer the same for the students who joined in June 2022 onwards, be approved.
- 22.0.3 That the recommendation of the Board of Studies to introduce Value Added Course on **Training Methods in Physical Education** in Semester II of the UG Programme and to introduce the same for the students who joined in June 2023 onwards, be approved.
- 22.0.4 That the recommendation of the Board of studies to introduce internal evaluation pattern for all practicals of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.
- 22.0.5 Ms.I.Juliet Shanthi seconded the same and the resolutions were approved without amendments.
- 23.0.0 **Ms.I.Juliet Shanthi**, Chairperson, Board of Studies in Computer Science moved the following resolutions.
- 23.0.1 That the recommendation of the Board of Studies to revise Core, Core Lab, Allied, Non-Major Electives and Skill Based Electives in Semesters III & IV of the UG Programme and to introduce the same for the students who joined in June 2023 onwards, be approved.
- 23.0.2 Dr.S.Valanarasu seconded the same and the resolutions were approved without amendments.
- 24.0.0 **Ms.I.Juliet Shanthi**, Chairperson, Board of Studies in Computer Applications moved the following resolutions.
- 24.0.1 That the recommendation of the Board of Studies to revise Core, Core Lab, Core Elective in Semesters III & IV of the PG Programme (MCA) and to introduce the same for the students who joined in June 2022 onwards, be approved.
- 24.0.2 That the recommendation of the Board of Studies to introduce the new structure and syllabus for new courses BCA and M.Sc Computer Science in Semesters I & II of the UG

Programme and to introduce the same for the students who joined in June 2023 onwards, be approved.

24.0.3 Dr.A.Sundararaj seconded the same.

25.0.0 Dr.R.Albert Christopher Dhas, in his general observation, informed that there is lot of inconsistencies in the hours and credits. He requested to follow uniform credit allocation based on hours of teaching.

25.0.1 Fr. Principal requested the Dean-Academic to make a study regarding the issue.

25.0.2 After the discussion the resolutions were approved without amendments.

26.0.0 **Rev. Dr. Godwin Rufus, S.J.**, Principal and Chairperson of Academic Council thanked all the members for the suggestions and genuine recommendations. He suggested that while evaluating OBE we could get more clarity regarding the curriculum and evaluation.

27.0.0 The meeting came to an end with the prayer by **Dr.I.Pradeepa**, Vice Principal (Shift II)

**PRINCIPAL & CHAIRPERSON  
ACADEMIC COUNCIL**

**DEPARTMENT OF TAMIL**



**அருள்ஆனந்தர்கல்லூரி (தன்னாட்சி) - தமிழ்த்துறை**

பணிவாய்ப்புபடிப்பு

**தாள்: போட்டித்தேர்வுத்தமிழ்**

<b>நோக்கம் :</b>		<b>(30 மணிகள்)</b>
1. தமிழ்இலக்கிய, இலக்கணத்தின்வரலாற்றை அறியச்செய்தல் 2. போட்டித்தேர்வுகளில் பங்கெடுக்கவைத்தல்		
<b>கூறு 1 :</b>		<b>(10மணிகள்)</b>
	ஓரெழுத்துஒருமொழி - சொற்களைப்பிரித்துஎழுதுதல் - எதிர்ச்சொல்லை எழுதுதல் - பொருந்தாச்சொல்லைக்கண்டறிதல் - ஒலிவேறுபாடறிந்து சரியானபொருளை அறிதல் - வேர்ச்சொல் அறிதல் - வேர்ச்சொற்களைக் கொண்டுவினைமுற்று, வினையெச்சம், வினையாலணையும்பெயர் - தொழில்பெயரைஉருவாக்கல் - இலக்கணக்குறிப்பறிதல் - சொல்லின்வகை அறிதல் - வாக்கியவகை அறிதல் - உவமையால் விளக்கப்பெறும் பொருத்தமானபொருளைத்தேர்ந்தெடுத்தல்	
<b>கூறு 2 :</b>		<b>(10மணிகள்)</b>
	விடைக்கேற்றவினாஅமைத்தல் - விடைவகைகள் - அகரவரிசைப்படி சொற்களைநிரல்படுத்துதல் - இருவினைகளில்பொருள்வேறுபாடு அறிதல் - ஆங்கிலச்சொல்லுக்குநிகரானதமிழ்ச்சொல் அறிதல் - பிழைதிருத்தம் - சந்திப்பிழைநீக்குதல் - மரபுப்பிழை, வழவுச்சொற்களைநீக்குதல் - பிறமொழிச்சொற்களைநீக்குதல்- ஒருபொருள்தரும்பலசொற்களை அறிதல்- பலபொருள்தரும்ஒருசொல் அறிதல்- அலுவல்சார்ந்தகலைச்சொற்கள் - நூல் - நூலாசிரியர் அறிதல்	
<b>கூறு 3 :</b>		<b>(10மணிகள்)</b>
	சங்கஇலக்கியம் - அறஇலக்கியம் - கப்பியஇலக்கியம் - சமயஇலக்கியம் - சித்தர்பாடல்கள் - சிற்றிலக்கியங்கள் - இக்காலஇலக்கியம்வரலாறு (அறிமுகநிலையில்)	

**பாடநூல் :** போட்டித்தேர்வுக்கையேடு,

(தமிழ்த்துறைவெளியீடு),

பிரிட்டோபப்ளிகேசன்ஸ்,

அருள்ஆனந்தர்கல்லூரி, கருமாதூர் - 625 514

**போட்டித்தேர்வுத்தமிழ் -தேர்வுஅமைப்பு**

அகமதிப்பீட்டுத்தேர்வு : 40 மதிப்பெண்கள்

புறமதிப்பீட்டுத்தேர்வு : 60 மதிப்பெண்கள்

மொத்தமதிப்பெண் : 100

**போட்டித்தேர்வுத்தமிழ் - வினாத்தாள்அமைப்பு (அகமதிப்பீடு)**

ஒருமதிப்பெண்வினா – (60x1=60) தேர்வுகாலம் : 2 மணிநேரம்

**போட்டித்தேர்வுத்தமிழ் - வினாத்தாள்அமைப்பு (புறமதிப்பீடு)**

ஒருமதிப்பெண்வினா – (40x1=40) தேர்வுகாலம் : 1 மணிநேரம்

**கற்பித்தல் முறைகள்**

- கரும்பலகையைப் பயன்படுத்துதல்
- விரிவுரை, விவரித்தல், கலந்துரையாடல்
- வினாடி வினா,

**கற்றலின் விளைவு**

வரிசைஎண்	கற்றலின் விளைவு(Course Outcome)	மதிப்பீட்டுநிலை(Knowledge LevelBlooms's Taxonomy)
CO1	மரபு, புதுக்கவிஞர்கள்- கவிதைகள் - உரைநடை - இலக்கணம் ஆகியவற்றின் வழி போட்டித்தேர்வுகளுக்கான செய்திகளை அறிந்துகொள்வர்.	K1
CO2	மாதிரித் தேர்வு வழி மொழித்திறன், இலக்கியச் சுவையுணர்தல், புதிய சொற்களை அறிதல், ஓசைநயம் உணர்தல், எதுகை, மோனை அறிதல் ஆகிய திறன்களைப் பெறுவர்	K1,K2
CO3	உரைநடை வழி புதிய சொற்களை அறிதல், அவற்றின் பொருளறிதல், அவற்றின் வகையறிதல் (பெயர், வினை,இடை,உரி) ஒருசொல் தரும் பல பொருள், ஒரு பொருள் தரும் பல சொல், மரபுத்தொடர், தொடரமைப்பு, மயங்கொலிச் சொற்கள், மொழித்தூய்மை (பிறமொழிகலவாமை) ஆகியவற்றை	K1,K3

	அறிதல் மொழியைக் கையாளத் திறன் பெறுவர்,	
<b>CO4</b>	தமிழ்மொழியின் அமைப்பைத் தெரிவதோடு, பிழையில்லாமல் பேசவும், எழுதவும், வாசிக்கவும் திறன் பெறுவர்.	<b>K1,K2</b>
<b>CO5</b>	ஒருபொருள் தரும் பல சொல் , பலபொருள்தரும் ஒருசொல் , பெயரடை, வினையடை, வருணனைத் தொடர்கள் ஆகியவற்றைப் பயன்படுத்தும் திறன் பெறுவர்.	<b>K1,K3</b>

வினாத்தாள் அமைப்பு முறை (**Blue Print**)

பகுதி	மதிப்பெண்	அலகு 1	அலகு 2	அலகு 3	மொத்தம்
<b>அ</b>	<b>15</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>15</b>
<b>ஆ</b>	<b>15</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>15</b>
<b>இ</b>	<b>30</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>30</b>
மொத்தம்	<b>60</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>60</b>

**Arul Anandar College (Autonomous)**

Karumathur, Madurai District.

**Department of Tamil**

**Value Added Course**

**தமிழ் ஊடகம்(Tamil Media)**

Hours: 30 Hours

**Learning Outcomes:**

1. தொடர்பியல் மற்றும் மக்கள் தொடர்பியல் குறித்த அடிப்படை புரிதல் மற்றும் அறிவை மாணவர்கள் பெறுவர்.
2. தமிழில் அச்ச ஊடகங்கள் , மற்றும் மின்னணு ஊடகங்கள் குறித்த பரந்துபட்ட தகவல் அறிவைப் பெறுவர்.
3. ஊடகங்களில் தமிழ் மொழிப் பயன்பாடு சார்ந்த அடிப்படைப் பயிற்சிகளைப் பெறுவர்.

**பாடத்திட்ட வரையறை**

**அலகு-1 தொடர்பியல் - அடிப்படைகள் (10 மணி நேரம்)**

தகவல் தொடர்பியல் – மக்கள் தொடர்பியல் – அறிமுகம் , அடிப்படை , தோற்றம், வளர்ச்சி, விளக்கம், வரையறை, பணிகள் – ஊடக வளர்ச்சி - தாக்கம்

**அலகு-2 தற்காலத் தமிழ் ஊடகங்கள் (10 மணி நேரம்)**

இதழ்கள், வானொலி, திரைப்படம், தொலைக்காட்சி, இணையம், திறன்பேசி – அறிமுகம், விளக்கம், வகைகள்

**அலகு-3 ஊடகத் தமிழ்ப் பயிற்சி (10 மணி நேரம்)**

செய்தி, செய்திக் கட்டுரை எழுதுதல் , பிழை திருத்தம் செய்தல் , தமிழ் உச்சரிப்புப் பயிற்சி, நேர்காணல் பயிற்சி , தமிழ்த் தட்டச்சு மென்பொருள் பயன்பாடு –

திரைக்கதை, திரைப்படப் பாடல் உருவாக்கம் , ஆவணப்பட உருவாக்கம் -சமூக ஊடகங்களில் தமிழ்ப் பயன்பாடு

**தமிழ்ஊடகம் - தேர்வுஅமைப்பு**

அகமதிப்பீட்டுத்தேர்வு : 30 மதிப்பெண்கள்  
செய்முறைபயிற்சிஏடு : 10 மதிப்பெண்கள்  
புறமதிப்பீட்டுத்தேர்வு : 60 மதிப்பெண்கள்  
மொத்தமதிப்பெண்கள் : 100

**தமிழ்ஊடகம் - வினாத்தாள்அமைப்பு (புறமதிப்பீடு)**

ஒருமதிப்பெண்வினா - (15x1=15)  
சிறுவினா - (3x5=15)  
பெருவினா - (3x10=30)  
தேர்வுக்காலம் : 2 மணிநேரம்

**தமிழ்ஊடகம் - வினாத்தாள்அமைப்பு (அகமதிப்பீடு)**

ஒருமதிப்பெண்வினா - (3x1=3)  
சிறுவினா - (3x3=9)  
பெருவினா - (3x6=18)  
தேர்வுக்காலம் : 1 மணிநேரம்

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**கற்பித்தல் முறைகள்**

- கரும்பலகையைப் பயன்படுத்துதல்
- விரிவுரை, விவரித்தல், கலந்துரையாடல்
- வினாடி வினா,

## கற்றலின் விளைவு

வரிசை எண்	கற்றலின் விளைவு(Course Outcome)	மதிப்பீட்டுநிலை(Knowledge Level Blooms's Taxonomy)
CO1	ஊடகத்தின் வகைகள் – வரலாறு அறிந்து கொள்வர்	K1
CO2	ஊடகத்தில் தமிழ்பயன்பாடு – பயன்பாட்டுத்திறன் ஆகியவற்றை அறிந்து கொள்வர்	K2
CO3	இணைய முறையைப் பயன்படுத்து தமிழ் தட்டச்சு பயிற்சி பெறுவர்	K1,
CO4	தமிழ் மொழியின் அமைப்பைத் தெரிவதோடு, பிழையில்லாமல் எழுதக்கற்றுக்கொள்வர்	K1, K2
CO5	ஊடகத்திற்கான மொழியமைப்பை எழுதிப்பார்த்து பயிற்சி பெற்று பயன்படுத்தக் கற்றுக்கொள்வர்	K1, K3

## வினாத்தாள் அமைப்பு முறை (Blue Print)

பகுதி	மதிப்பெண்	அலகு 1	அலகு 2	அலகு 3	மொத்தம்
அ	15	5	5	5	15
ஆ	15	5	5	5	15
இ	30	10	10	10	30
மொத்தம்	60	20	20	20	60

**DEPARTMENT OF ENGLISH**



**ARUL ANANAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF ENGLISH**  
**VALUE ADDED COURSE**

**Course Code : 23VENO1**

**Semester : Odd**

**Hours : 30**

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**English for TNPSC, SSC, IFS & Banking Examinations**  
(To be introduced from the academic year 2024-25)

**Learning Outcome:**

On successful completion of the course the students

- will have learnt the basics of English Grammar- Parts of Speech, Tenses, Sentence Patterns, Sentence Arrangements and Articles
- will have obtained the skill of comprehending passages in English
- will have gained confidence in answering the questions under English Section in competitive examinations like TNPSC, Banking, SSC& IFS

**UNIT I: (10 Hours)**

Parts of Speech  
Verb Structures  
Usage of Tenses  
Practice Questions in Error Spotting

**UNIT II: (10 Hours)**

Usage of Articles  
Sentence Patterns  
Sentence Arrangements  
Practice Questions in Error Spotting, Word Swab

**UNIT III: (10Hours)**

Reading Comprehension  
Misspelt Words  
Coherence  
Practice Questions in Reading Comprehension, Misspelt words and Para Jumbles

**Books for Reference:**

- 1) *High School English Grammar* - Wren & Martin (Current Edition)
- 2) *Intermediate English Grammar* – Raymond Murphy
- 3) *Objective English for Competitive Examinations* – Tata McGraw Hill Education Private Limited, New Delhi
- 4) *Objective English* – Edgar Thorpe & Showick Thorpe(2023)
- 5) *Previous Years' Questions* – SBI JA Prelims & Main, RBI, TNPSC Group Exams , SSC& IFS



**DEPARTMENT OF HISTORY**



ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625514				
Proposed CBCS STRUCTURE for B.A.PHILOSOPHY, ECONOMICS, HISTORY, ENGLISH LITERATURE, TAMIL LITERATURE (2022-2023)				
Part	Sub. Code	Paper	Hours	Credits
<b>I Semester</b>				
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil/ Hindi/French	06	4
II	22UENA11 22UENB11	English through Prose & Short Story - Stream – A English through Prose & Short Story - Stream – B	05	4
III	22UHSC11	Core : 1 History of Madurai	06	5
	22UHSC21	Core : 2 Heritage Tourism of India	06	5
	22UECB11	Allied – 1. General Economics	05	4
IV	22UFCE11	FC- Personality Development	01	01
	22UCSH12	Communication Skills	01	
	22UBRC11	Bridge Course	-	1
V	22UNCC/NSS/ PHY.EDU/YRC/ ROT/ACF/ NCB12	Extension Activities NCC/NSS /Phy.Edn. /YRC /ROTARACT/AICUF/Nature Club	-	-
			30	24
<b>II Semester</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil /Hindi /French	06	4
II	22UENA22 22UENB22	English through Prose & Poetry - Stream – A English through Prose & Poetry - Stream – B	05	4
III	22UHSC32	Core : 3 History of India – I (Early Times to 712 CE)	06	5
	22UHSC42	Core : 4. History of Ancient Civilizations	06	4
	22UECB22	Allied – 2. Indian Economy	05	4
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	01	1
	22UCSH12	Communication Skills	01	1
V	22UNCC/NSS/ PHY.EDU/YRC/ ROT/ACF/ NCB12	Extension Activities NCC /NCC/Phy.Edn./YRC/ROTARACT/AICUF/Nature Club	-	1
			30	24

III Semester				
I	22UTAL13/ 22UHNL13/ 22UFNL13	Tamil / Hindi / French	06	4
II	22UENG33	English through Literature – I	06	4
III	22UHSC53	Core: 5 – History of India – II (from 712 to 1707 AD)	05	4
	22UHSA33	Allied – 3. Social History of India	05	4
	22UHSE13	Core Elective – 1. History of Tamil Nadu-I (upto 1336 AD)	04	3
IV	22UHSN13	Basic Tamil/Advanced Tamil/Non-major Elective – 1. History of Freedom struggle in India	03	2
	22UFCE33	FC- Environmental Studies	01	01
V	22UNCC/NSS/ PHY.EDU/YRC/ ROT/ACF/ NCB24	Extension Activities NCC /NSS/Phy.Edn./YRC/ROTARACT/AICUF/Nature Club	-	-
	22UARE14	ARISE	-	-
			30	22
IV Semester				
I	22UTAL14/ 22UHNL14/ 22UFNL14	Tamil / Hindi / French	06	4
II	22UENG44	English through Literature – II	06	4
III	22UHSC64	Core: 6. History of India – III ( 1707 AD-1857 AD)	05	5
	22UHSA44	Allied – 4 Main Currents of Medieval Europe	05	4
	22UHSE24	Core Elective – 2. History of Tamil Nadu – II (1529 to Present day )	04	3
IV	22UHSN24	Basic Tamil/Advanced Tamil/Non-Major Elective –2. Constitution of India	03	2
	22UFCH44	FC. Religious Literacy and Peace Ethics	01	1
V	22UNCC/NSS/ PHY.EDU/YRC/ ROT/ACF/ NCB24	Extension Activities NCC /NSS/Phy.Edn. /YRC /ROTARACT/AICUF/Nature Club	-	1
	22UARE14	ARISE	-	1
			30	25

<b>V Semester</b>				
III	22UHSC75	Core: 7. India's Struggle for Freedom	05	5
	22UHSC85	Core: 8. Principles and Methods of Archaeology	05	4
	22UHSC95	Core: 9. Main Currents of the Modern World I	05	4
	22UHSD05	Core: 10. Indian Polity	05	4
	22UHSD15	Core: 11. History of Science of & Technology	05	4
IV	22USBZ15	SBE – 1 Fundamentals of Computer, Internet and Office Automation	01	1
	22USBY15	SBE – 1 Fundamentals of Computer, Internet and Office Automation - Practical	02	1
	22USSI16	Soft Skills	02	
	22UINT15	Internship	0	1
			<b>30</b>	<b>24</b>
<b>VI Semester</b>				
III	22UHSD26	Core: 12. India Since Independence	05	5
	22UHSD36	Core: 13. Historiography	05	4
	22UHSD46	Core:14. Main Currents of the Modern World II	05	4
	22UHSD56	Core:15. International Relations	05	4
	22UHSD66	Core:16. Human Rights	05	4
IV	22USBZ26	SBE – 2 Web Design	01	1
	22USBY26	SBE – 2 Web Design - Practical	02	1
	22USSI16	Soft Skills	02	2
			<b>30</b>	<b>25</b>

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPT OF HISTORY**

**PROGRAMME SPECIFIC OUTCOMES**

*Upon completion of the B.A History course the students would*

<b>PSO 1</b>	Correlate the general course of human history in multiple areas of the world.
<b>PSO 2</b>	Analyze the fundamental Social, Economic, Political and Religious institutions existed in India through the ages.
<b>PSO 3</b>	Acquire administrative and exhibit managerial skills, problem solving skills, critical thinking and reflective thinking to receive placements in any companies, firms and managerial positions.
<b>PSO 4</b>	Develop the skills needed to pursue competitive examination which enhances the job opportunities.
<b>PSO 5</b>	Develop the knowledge of the administrative system of various countries, governments and Public Administration which make the students to be social responsible citizen of India.

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625 514

DEPARTMENT OF HISTORY

Class	: III B.A. (History)	Part	: III Core – 7
Semester	: V	Hours	: 75
Sub-Code	: 22UHSC75	Credits	: 05

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INDIA'S STRUGGLE FOR FREEDOM (1800 CE - 1947CE)

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

Course Educational Objectives

To make the students to

1. Recall the causes for the national awakening and the early uprisings against the British Colonial Empire in India.
2. Classify the Moderates, Extremists and the Revolutionary ideals in the Indian National Movement.
3. Evaluate the ideals and practices of Gandhiji in the Freedom Movement.
4. Assess the contribution of Netaji and the last phase of the Indian Freedom Struggle.
5. Criticize the impact of Communalism in Indian National Movement.

Unit – I

15 hours

National Awakening

National Awakening - Causes– Early uprisings - South Indian Rebellion (1800-1801 CE) – Vellore Mutiny (1806 CE) – Causes - Impact.

Unit – II

15 hours

Indian Nationalism

1857 Mutiny - Causes – Course - Results –Socio-Religious Movements – Indian National Congress – Partition of Bengal - Swadeshi Movement – Muslim League – Surat Split - Moderates – Extremists – Home Role Movement

Unit – III

India after World War I

15 hours

Gandhian Era – Ideals and Practices – 1919 Act – Its implications – Non-Co-operation Movement – Swaraj Party – Simon Commission – Birth of Communist Party of India – 1928 All Party Congress – 1929 PoornaSwaraj – Civil Disobedience Movement- Round Table Conferences

Unit – IV

15 hours

India after World War II

Subash Chandra Bose – INA – British Imperialism in Peril – Cripps Mission – Quit India Movement – Cabinet Mission Plan – Post War Upheaval – INA Trial – Naval Mutiny – Jinnah – Two Nation Theory – C.R. Formula- Mountbatten Plan – Partition – Independence.

## Unit – V

15 hours

### Communalism and National Movement

Early Ideologies – Divide and Rule Policy – Formation of the Muslim League – Communal Award - Revival of Communal Practices - Hindu Mahasabha – Muslim Reaction –Communal Holocaust.

#### Books for Study

1. Arora Prem - Constitutional Development and National Movement in India, Book Hives, Delhi, 2005.
2. Venkatesan, G. -History of Freedom Struggle in India, V.C. Publication, Rajapalayam, 2006.
3. 1857 The uprising, Gautam Gupta, 2008.
4. Tara Chand, History of Freedom movement in India, Vol, III 2007.

#### References

1. Bipan Chandra - India's Struggle for Independence, Penguin, Haryana, 2016.
2. JagannathSarkar and A.B. Baradhan- India's Freedom Struggle–Several Streams, PeoplesPublishing House, New Delhi, 1999.
3. Jim Maselos - Indian Nationalism An History, Sterling Publication, Delhi, 1991.
4. Govt. of Tamil Nadu - Who's Who of Freedom Fighters, (Tamilnadu), Chennai, 1973 (2 Vols.)
5. Maulana Azad - India Wins Freedom, Orient Longman, Madras, 1988.
6. Rajkumar (Ed.) - Essays on Indian Freedom Movement, Discovery Publication House, Delhi, 2003.
7. SumitSarkar - Modern India (1885-1974), Macmillian, New Delhi, 1986.
8. David Arnold, The Congress in Tamil Nad, Nationalist Politcs in South India( 1919-1937), The Australian National University,Canberra&Manohara Book Service, New Delh,1977.
9. S.N.Sen, History of the Freedom Movement of India,1857-1947,New Delhi, 1989.
10. *Krishna Mohan*.Encyclopaedic History of Indian *Freedom Movement*, . 4vols, Anmol Publications, New Delhi 1999.

#### Teaching Learning Methods

Lecture Method

Power Point Presentation

Group Discussion

Seminar

Assignment

## Course Outcome

Students will be able to

<u>Course Outcome No.</u>	<u>Course Outcome</u>	<u>Knowledge Level</u>
CO1	Define Nationalism and the factors leading to the National awakening	K1
CO2	Illustrate the first phase of the Indian Freedom Struggle	K2
CO3	Analyze the Gandhian Era in Indian Freedom Struggle	K4
CO4	Summarize the role Subash Chandra Bose and Indian National Army	K5
CO5	Evaluate influence of Religion in National Movement	K5

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyse, K5-Evaluate, K6-Create**

## Mapping Course Outcome with PSO and PO

Out come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1						3	2	2	2	2				11
CO2						2	3	3	2	2				12
CO3	3	3	2	2	2	2	3		2	3	3	2	2	29
CO4	3	3	3	3	3	1	3		2	2	3	3	3	32
CO5	2	2	3	3	3	2	2		2	3	3	3	3	31
Grand Total of COs with PSO and POs														115
Grand total of COs with PSOs and POs = 115														
Mean Value of COs with PSO and POs = $\frac{115}{46} = 2.5$														2.5

Strong – 3 Medium – 2 Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.5</b>
<b>Observation</b>	<b>COs of India Struggle for Freedom Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625 514

DEPARTMENT OF HISTORY

Class : III B.A. (History)

Part : III Core -8

Semester : V

Hours : 75

Sub-Code : 22UHSC85

Credits : 04

PRINCIPLES AND METHODS OF ARCHAEOLOGY

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

Course Educational Objectives

To make the students to

1. Provide basic information in the discipline of Archaeology and Museology.
2. Trace the historical development of archaeology in India, highlighting key milestones and influences that shaped the discipline.
3. Examine the concept of Historical Archaeology and its significance in integrating material culture with historical records to provide a holistic understanding of the past
4. Guide students in understanding on-site investigation procedures and the factors that shape survey design, fostering a well-rounded approach to fieldwork.
5. Introduce students to scientific methods for analyzing organic materials in archaeological contexts.

Unit – 1

Introduction

15 hours

Definition, nature, scope of Archaeology - Kinds of Archaeology - other disciplinary subjects: Geology – Geography - Anthropology

Unit II:

History of Archaeology in India

15 hours

Origin and development of Archaeology in India-

Contributions of Eminent Archaeologists: Alexander Cunningham - Sir John Marshall - Sir Mortimer Wheeler – Development since Independence.

Unit III:

Archaeology and other Discipline

15 hours

Functions of an Archaeologist - Value of Archaeology - Epigraphy - Numismatics - Iconography - Historical Archaeology – Conservation of Archaeological and Historical remains.

Unit IV:

Exploration Methods

15 hours

Determination of archaeological data – Type of sites - Selection of a site - research design - On-site investigations - Factors in survey design – Site survey methods – Aerial reconnaissance – Shadow mark – Soil mark – Crop Mark – Photogrammetry – Stereoscopy – Periscope photography – Geophysical methods – Resistivity survey – Ground penetrating radar – Magnetometer

## Unit V

### Excavation Methods

15 hours

Interpretation of Excavated Materials – Classification of Artifacts – Contextual and Site Catchment Analysis; Pottery and Antiquities: Description and Analysis – Scientific Analysis of Organic Materials.

#### Books for Study:

1. Archaeological Survey of India Archaeological Remains Monuments & Museums (Part I & II), New Delhi, 1996.  
Balasubramanyam, Early Chola Temple Architecture  
Balasubramanyam, Later Chola Temple Architecture  
Balasubramanyam, Middle Chola Temple Architecture  
Clark D.L., Analytical Archaeology
2. Dhaky, M.A. Ed. Encyclopedia of Indian Temple Architecture of North India, American Institute of Indian Studies, OUP, Delhi, 1991.
3. Dhaky, M.A. Ed. Encyclopedia of Indian Temple Architecture of South India, American Institute of Indian Studies, OUP, Delhi, 1991.

#### Books for References

1. Dhani, S., Paleography and Development of Archaeology, ASI Gopinath Rao, Indian Iconography, Grace Morley, Museum Today John Marshall, Conservation Manual, Madras, Asian Educational Service, 1990.
2. K.V. Raman, Principles and Methods of Archaeology, Parthajan Publications, Chennai, 1998  
Roy. Surindranath, The Story of Indian Archaeology, New Delhi, 1961.
3. Sankalia H.D., New Archaeology Its Scope and Application to India, Lucknow 1974  
Webster Graham, Practical Archaeology

#### Teaching Learning Methods

- Class Lecture
- Power Point Presentation,
- Group Discussion,
- Seminar,
- Study Trip to Heritage Monuments,
- Assignment etc.,

#### Course Outcome

The students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Define the nature and scope of archaeology in a cultural context.	K1

CO2	Illustrate the origin and development of archaeology in India	K2
CO3	Analyze the functions of archaeologists and other spheres of Archealogy.	K4
CO4	Summarize varied archaeological data determination methods, site selection, and research design.	K5
CO5	Evaluate the scientific methods of analysing organic materials in archaeological context	K5

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyse, K5-Evaluate K6-Create**

**Mapping Course Outcome with PSO and PO**

Out come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of Co's with PSO's & POs
CO1	2	2				2	2	2	3	3	2	1	1	20
CO2	3	3	2	2	2	1	3	1	2	2	3	2	2	28
CO3	3	3	2	2	2	3	1		2	2	3	2	2	27
CO4	2	2	3	3	3	3	2		2	2	2	3	3	30
CO5	2	2	3	3	3	1	1		2	2	2	3	3	27
Grand Total of COs with PSO and POs														132
Grand total of COs with PSOs and POs 132														
Mean Value of COs with PSO and POs = ----- = 2.23														2.23
Number of COs relating with PSOs and POs 59														

Strong – 3 Medium – 2 Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.23</b>
<b>Observation</b>	<b>COs of History of Madurai Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514

DEPARTMENT OF HISTORY

Class : III B.A. (History)

Part : III Core -9

Semester : V

Hours : 75

Sub-Code : 22UHSC95

Credits : 04

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MAIN CURRENTS OF THE MODERN WORLD – I (1453 CE – 1919 CE)

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives**

**To Make the Students to**

1. Recognize the reason led to the enlightenment of the people and the Social Changes.
2. Justify the values of inquisitiveness, liberty, equality and fraternity.
3. Analyse the relevance of National Movements of modern period in the world.
4. Assess the problems of the Far Eastern Countries.
5. Evaluate the major global events and trends of the interwar period.

**Unit – I: Age of Reason and Enlightenment:**

**15 hours**

Renaissance and Results – Nation States – Geographical Discoveries – Reformation – Divine Right Theory and Enlightened Despotism – Napoleon

**Map:** Routes of Geographical Discoveries

**Unit – II: Revolutions for Human Rights**

**15 hours**

- i) Glorious Revolution (1688) – causes and results
- ii) French Revolution (1789) – causes and results
- iii) Russian Revolution (1917)

**Unit – III: Brief Survey – National Movements**

**15 hours**

- i) American War of Independence – causes and results
- ii) Unification of Italy – causes and results
- iii) Unification of Germany – causes and results

**Map:** Unification of Italy

**Unit – IV: Brief Survey: Response of the Far East to the West**

**15 hours**

- i) Open Door Policy in China – Features and Impact
- ii) Opium Wars in China – causes and results
- iii) Meiji Restoration in Japan – causes and results

**Unit – V : Outcome of Imperialism**

**15 hours**

First World War – Causes – Course - Results.

**Books for Study**

1. Paramasivam, M. & G. Sethuraman - History of China and Japan (2<sup>nd</sup> Ed). Pannai Pathippagam, Madurai, 1985.
2. Rao, B.V. - World History, Sterling Publishers, New Delhi, 1988.
3. Swain, J.E. - History of World Civilization (II Ed), Eurasia Publishing House, New Delhi, 1994.
4. Mahajan, V.D., - Modern Europe Since 1789, Chand & Co., New Delhi, 1980.

### Book for References

1. Darling Kindersley, - History of the World, D.K. Publication, London, 1994.
2. Lowe Norman, - Mastering Modern World History (III Ed), Macmillan, Delhi, 1997.
3. Marshall Smelser, - American History at a Glance, Barnes and Nobel, INC, New York, 1966.
4. Hobsbawn, - The Age of Revolution (1789-1848), Rupa& Co, Calcutta, 1992.
5. Hobsbawn, -The Age of Empires (1875-1914), Rupa& Co., Calcutta, 1992.
6. B. K. Gokhale, *Introduction to Western civilization*, New Delhi: S. Chand and Company 1973.
7. Hew Strachan, *The Oxford Illustrated History of the First World War*. Oxford: Oxford University Press, 2014.
8. Chris Harman, *A Peoples History of the World*, Orient Longman, 2007
9. Albert S. Lindemann, *A History of Modern Europe: From 1815 to the Present*, Wiley-Balckwell, West Sussex, UK, 2013.
10. B.V. Rao, *History of Modern Europe, A.D. 1789 – 2013*, Sterling Publishers, New Delhi, 2014.
11. David S. Mason, *Main Currents in the History of the Modern World*, Routledge, London, UK, 2022

### Teaching Learning Methods

Lecture Method  
Power Point Presentation  
Group Discussion  
Seminar  
Assignment

### Course outcome

#### Students will able to

Coarse Outcome No	Coarse Outcome	Knowledge Level
CO1	Discover the enlightenment of the people and the changes of societies in modern world	K3
CO2	Point out the importance of the inquisitiveness, liberty, equality and fraternity.	K4
CO3	Justify the emergence and spread of National Movements of modern period in the world.	K4
CO4	Discuss the problems and the impacts of the Far Eastern Countries.	K5
CO5	Identify the impacts of the First World War in Modern world	K5

**K1 – Remember, K2 – Understand , K3-Apply , K4- Analyse, K5-Evaluate K6-Create**

### Mapping Course Outcome with PSO and PO

Out come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1	2	2				2	2	2	3	3	2			18
CO2	3	3	2	2	2	1	2	1	2	2	3	2	2	27
CO3	3	3	2	2	2	2	2	1	2	2	3	2	2	25
CO4	2	2	3	3	3	2	2		2	2	2	3	3	29
CO5	2	2	3	3	3	2	1		2	2	2	3	3	28
Grand Total of COs with PSO and POs														127
Grand total of COs with PSOs and POs 127														2.26
Mean Value of COs with PSO and POs = ----- = 2.26 Number of COs relating with PSOs and POs 56														

Strong – 3    Medium – 2    Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.26</b>
<b>Observation</b>	<b>COs of Main Currents of the Modern World I Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514

DEPARTMENT OF HISTORY

Class : III B.A. (History)

Part : III Core – 10

Semester : V

Hours : 75

Sub-Code : 22UHSD05

Credits: 04

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INDIAN POLITY

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

Course Educational Objectives

To Make the Students to

1. Recall the Constitutional development in India since 1947.
2. Evaluate the salient features of Indian Constitution.
3. Describe the power and functions of Union Executive.
4. Explain the powers and functions of the Union Legislature.
5. Asses the power and functions of the Supreme Court.

Unit – I

15 hours

Indian Constitutional Development –

Acts of 1773, 1784, 1861, 1909, 1919, 1935, 1947 - Borrowed Features of Indian Constitution from other countries.

Unit – II

15 hours

Union Legislature

Lok Sabha – Rajya Sabha – Process of Law Making – Functions, Powers and Privileges – Political Parties and Pressure groups.

Unit – III

15 hours

Union Executive

President – Powers – Functions – Privileges – Emergency Powers – Vice-President – Prime Minister – Cabinet – Key Functionaries.

Unit – IV

15 hours

Indian Judiciary

Organization – Powers and Functions Status – Judicial Review – LokAyukta- LokAdalats

Unit – V

15 hours

Constitutional Bodies

Election Commission – Union Public Service Commission – State Public Service Commission – Comptroller and Auditor General of India – Attorney General of India

Books for Study

1. Competition Success - Constitution of India – At a Glance, New Review, Delhi, 13<sup>th</sup> Ed. 2002.
2. Gomathinayagam, P., - Modern Governments, Books Lands, Rajapalayam, 1986.
3. LaxmiKanth, M., - Indian Polity (for UPSC), TATA McGraw Hill, Delhi, 2004.

4. Mahajan, V.D., - Select Modern Governments, S. Chand & Co., New Delhi, 1984.
5. Laxmikanth .M, Indian Polity: A Concise Overview, McGraw Hill Education, New Delhi 2021.

#### Books for References

1. Agarwal, R.C., - Modern Indian Constitution and Administration, S. Chand & Co., New Delhi, 6<sup>th</sup> Ed., 1994.
2. Chandra Prakash - Indian Government and Politics, New Delhi, 1998.
3. Kapur, A.C., - Select Constitutions, S. Chand & Co., New Delhi, 1993.
4. Paul R. Brass - Caste Faction & Party in Indian Politics, 2 Vols., Chanakya Publications, Delhi, 1985.
5. Raja Ram Kalpana (Ed.) - Indian Polity, Spectrum Books (12<sup>th</sup> Re.Ed.), New Delhi, 2005.
6. Sharma Manoj, - Dynamics of Indian Politics, Anmol Publication, New Delhi, 2004.
7. Durga Das Basu, Introduction to the Constitution of India, LexisNexis India, Kolkata, 2020

#### Teaching Learning Methods

Lecture Method  
 Power Point Presentation  
 Group Discussion  
 Seminar  
 Assignment

#### Course outcome

Students will be able to

Course Outcome No	Course Outcome	Knowledge Level
CO1	Explain the Constitutional development in India since 1947.	K3
CO2	Illustrate the salient features of Indian Constitution.	K3
CO3	Analyse the power and functions of Union Executive.	K4
CO4	Generalize the powers and functions of the Union Legislature.	K5
CO5	Evaluate the powers and functions of the Supreme Court.	K5

**K1 = Knowledge, K2 = Understanding, K3 = Application, K4 = Analysis and K5 = Synthesis and Evaluation**

### Mapping Course Outcome with PSO and PO

Out Come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1	2	2				1	1	3	3	2	2			16
CO2	2	2		1		1	1	3	3	2	2			17
CO3	3	3	2	2	2	2	1	2	2	2	3	2	2	28
CO4	2	2	3	3	3	1	1		2	2	2	3	3	27
CO5	2	2	3	3	3	1	2		2	2	2	3	3	28
Grand Total of COs with PSO and POs														116
Grand total of COs with PSOs and POs = 116														2.14
Mean Value of COs with PSO and POs = -----=-----= 2.14 Number of COs relating with PSOs and POs 54														

Strong – 3 Medium – 2 Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.14</b>
<b>Observation</b>	<b>COs of Indian Polity Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514

DEPARTMENT OF HISTORY

Class : III B.A. (History)

Part : III Core -11

Semester : V

Hours : 75

Sub-Code : 22UHSD15

Credits : 04

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HISTORY OF SCIENCE AND TECHNOLOGY

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

Course Educational Objectives

To make the students to

1. Recognize the invention of the ancient world.
2. Illustrate the Chinese technology and inventions.
3. Examine the contributions of Arab Science to the world.
4. Identify the invention of the modern Europe.
5. Appraise the ancient Indian Science and technology.

Unit – I

Science and Technology in Ancient Europe

15 hours

Greek Science — Thales – Pythagoras – Hippocrates – Eratosthenes – Euclid – Archimedes – Roman Contributions: Galen – Ptolemy-Julian Calendar – Roman Roads and Transportations – Bridges – Aqueducts.

Unit – II

15 hours

Ancient Chinese Technology

Porcelain – Lacquering – Paper – Printing – Maps – Navigation – Gun Powder

Unit – III

15 hours

Arab Science

Medicine – Mathematics – Astronomy – Alchemy – Optics – Avicenna – Al-Khwarizmi – Umar Al-Khayyam – Harun Al-Rashid – Unani – Jabir-Ibn-Hayyan – Al Hazen.

Unit – IV

Science and Technology in Modern Europe

15 hours

Roger Bacon – Renaissance – da-Vinci – Astronomy Copernicus – TychoBrache – Galileo – John Kepler – Printing - Physics and Biology – Newton – Harvey – Hunter – Jenner - Industrial and Agrarian Revolutions – Inventions – Discoveries – Rail Road – Transport – Textile – Mining.

Modern Marvels – Faraday – Louis Pasteur – Dalton – Darwin – Ronald Ross – Modern Communicartion - Telegraph – Telephone – TV – Radio – Computer - Satellite Communication.

Unit – V

Science& Technology in India

15 hours

Astronomy – Medicine – Aryabhata – VarahaMihira – Baskara – Others – Ayur Veda. - Ramanujam – C.V. Raman – Chandra Bose – HomiBhaba – APJ Abdul Kalam

### Books for Study

1. Sampathkumar, V.S., Sundaraman, T., - A Textbook on History of Science, M.S. University, Tirunelveli, 1995.
2. Varghese Jeyaraj - History of Science and Technology, 2<sup>nd</sup> Ed., Anns Publications, Uthamapalayam, 2004.
3. Venkatraman, R., - History of Science and Technology, Ennes Publication, 1988.
4. Sanjay Sen, History of Science & Technology, NL Publishers, Asam, 2016.

### Book for References

1. Jain, N.K., - History of Science and Scientific Method, Oxford, Delhi, 1982.
2. Kuppuram, G., Kumudamani, K., - History of Science & Technology in India (12 Vols.), SundeepPrakashan, Delhi, 1990.
3. Nadkarni, K.M., - Indian Materia Medica, Popular Prakashan, Bombay, 1976.
4. Ariviyal Kalanjiam (Tamil) (9 Vols.), Tanjore Tamil University, Tanjore, 1986.
5. Encyclopedia of Science and Technology (9 Ed.), 20 Vols., McGraw Hill, New York, 2002.
6. The New Book of Knowledge – The Children's Encyclopaedia Publication, Grolier Incorporated, New York, 1968.
7. James E. MC Clellan Science & Technology in World History: An Introduction, John Hobkins University Press, 2015.

### Teaching Learning Methods

- Class Lecture
- Power Point Presentation,
- Group Discussion,
- Seminar,
- Study Trip to Heritage Monuments,
- Assignment etc.,

### Course Outcome

The students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Define the ancient Greece inventions	K1
CO2	Distinguish the Chinese technology Greek technology	K2
CO3	Assess the Arabs in the field of Science	K3
CO4	Discuss the modern European Science and its impact	K5
CO5	Recognise the science and technology development in India through the ages	K5

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyse, K5-Evaluate, K6-Create**

### Mapping Course Outcome with PSO and PO

Out come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1				2		3	2	2	2	2	1			14
CO2		2	1	2		2	3	2	2	2	2			18
CO3	2	2	2	1	2	2	2	2	3	3	2			23
CO4	2	2	2	3	3	2	2		2	2	2	3	3	28
CO5	2	2	2	2	2	3	3		1	1	2	2	2	24
Grand Total of COs with PSO and POs														107
Grand total of COs with PSOs and POs 107														
Mean Value of COs with PSO and POs = $\frac{107}{51} = 2.09$														2.09

Strong – 3 Medium – 2 Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.09</b>
<b>Observation</b>	<b>COs of History of Science and Technology Strongly related with PSOs and POs</b>		

Class : All B.A./B.Sc.

Part : SLC

Semester : V

Hours :

Sub-Code: 22UHSSL5

Credits : 3

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**INDIAN HISTORY FOR COMPETITIVE EXAMINATIONS – II (From 1526 to 1950)**

**(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)**

**Course Educational Objectives**

**To Make the Students to**

1. Analyze the administration of Mughals.
2. Understand the advent of Europeans and the establishment of their settlements.
3. Analyze the outbreak of the Result of South Indian Rebellion.
4. Evaluate the role of Gandhi in the Indian Freedom Struggle.
5. Understand the basic concepts of the art of governing the State

**Unit – I:**

**The Moghuls**

Babur to Aurangzeb – Sur Interregnum – Administration – Society – Economy – Art and Architecture – Religion.

**Unit – II:**

**The Advent of Europeans**

- a) Portuguese, Danish, Dutch and French Settlements.
- b) The British – Carnatic Wars – Battle of Plassey – Buxar – Dual Government in Bengal.
- c) Annexationist Policies.
  - a) Subsidiary Alliance System.
  - b) Lapse Doctrine.

**Unit – III:**

**Nationalism**

Early uprisings in North – South Indian Rebellion – Vellore mutiny Sepoy Mutiny

1857 – Causes and results.

**Unit – IV:**

**Freedom struggle**

Indian National Congress – Extremists – Moderates – Partition of Bengal – Minto-Morley Act – Non Cooperation Movement – Montague-Chelmsford Reforms – Swadeshi movement – Terrorism – Round Table Conferences – Cripps Mission – Muslim League – Communal Award.

## Unit – V

### Government by the People of India

Government of India Act 1935 – Mountbatten Plan – Indian Independence Act – Partition – Indian Republic of 1950.

### Books for Study

1. Francis, S.R.S. **Premier IAS Main Manual**, CBS Publishers, New Delhi, 2007.
2. Reddy Krishna, **Indian History (2<sup>nd</sup> Ed)**, TATA McGraw Hill, New Delhi, 2004.

### Teaching Learning Methods

Self study

### Course outcome

Students will able to

Course Outcome No	Course Outcome	Knowledge Level
CO1	Illustrate the administration and the development of art and architecture of Mughal Empire	K3
CO2	Analyze the advent of Europeans and the establishment of their settlements	K4
CO3	Identify the outbreak of the Result of South Indian Rebellion	K4
CO4	Point out the significance of the Gandhian Era.	K4
CO5	Recognise the salient features of the Indian Constitution.	K5

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyse, K5-Evaluate, K6-Create**

### Mapping Course Outcome with PSO and PO

Out Come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1	2	2				1	2	2	3	3	2			17
CO2	3	3	2	2	2	1	2		2	2	3	2	2	26
CO3	3	3	2	2	2	1	1		2	2	3	2	2	25

CO4	3	3	2	2	2	1	1		2	2	3	2	2	25
CO5	2	2	3	3	3	1	1		2	2	2	3	3	27
Grand Total of COs with PSO and POs														120
Grand total of COs with PSOs and POs 120														2.14
Mean Value of COs with PSO and POs = ----- = 2.14														
Number of COs relating with PSOs and POs 56														

Strong – 3    Medium – 2    Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.14</b>
<b>Observation</b>	<b>COs of India History for Competitive Examination II Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625 514

DEPARTMENT OF HISTORY

Class : III B.A. (History)

Part : III Core – 12

Semester : VI

Hours : 75

Sub-Code : 22UHSD26

Credits : 05

INDIA SINCE INDEPENDENCE

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

Course Educational Objectives

To make the students to

1. Recognize the process of National Integration of India
2. Evaluate the declaration of emergency 1975 and its impact
3. Justify the reservation policy of India
4. Explain the important measures taken by Indian Government for the improvement of Education.
5. Examine the Economic and Scientific Development of India

**Unit – I**

**15 hours**

**Aftermath of Independence**– Pains of Partition – Integration of States – Reorganization of States – Junagadh- Hyderabad- Kashmir

**Unit – II**

**15 hours**

**Politics**

Congress Hegemony –Prime Ministers – Nehru – Sastri – Indira Gandhi – Split in the Congress – National Emergency in 1975 – Emergence of Coalition Politics – Janatha – Jan Sangh –Rise of BJP. Punjab Crisis – Operation Blue Star – Black Thunder .

**Unit – III**

**15 hours**

**Society**

Reservation Policy – Kaka Kalekar – Sattanathan – Mandal Commissions – Critics – Reservation for Women

**Unit – IV**

**15 hours**

**Education**

Operation Black Board – National Literacy Movement- National Literacy Mission – SarvaShikshaAbhiyan.

**Unit – V**

**15 hours**

**Economic and Scientific Developments**

Blue and Green Revolutions – Operation Flood – Marvels in Space and Nuclear Fields – Oceanography – Economic Survey – Growth of Industries – Transport in India – New Economic Policy – MNCs – Foreign Direct Investments –Retailers- The Problem of Black Money- Demonetisation 2016

## Teaching Learning Methods

Lecture Method

Power Point Presentation

Group Discussion

Seminar

Assignment

## Books for Study

1. AnletSobithabai, Contemporary History of India (1947-2004), Sharon Publication, Martandam, 2005.
2. Venkatesan, G., Contemporary India, V.C. Publication, Rajapalayam, 2007.
3. SathishDeshpande, Contemporary India – a Sociological view, Penguin, New Delhi, 2003.
4. RamachandraGuha, India After Gandhi: The History of the World's Largest Democracy, Ecco Press, USA, 2007.

## Books for reference

1. GopaSabharwal, India Since 1947 - The Independent Years, Penguin Publications, Delhi, 2018.
2. BipanChandra, *India Since Independence*, Penguin Books India 2008.
3. Chandel, L.S., - Objective Indian History, H.G. Publication, New Delhi, 2003.
4. Francis, S.R.S., - Premier IAS Main Manual, CBS Publishers, New Delhi, 2007.
5. Reddy Krishna, Indian History, (2<sup>nd</sup> Ed.), TATA McGraw Hill, New Delhi, 2004.
6. Thorner Daniel, The Shaping of Modern India, Allied Publications, Delhi, 1980.
7. ShashiTharoor, PaxIndica: India and the World of the 21st Century, Penguin Books India, 2012

## Course Outcome

### Students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Demonstrate the process of National Integration of India	K3
CO2	Criticize the declaration of emergency 1975 and its impact	K4
CO3	Justify the reservation policy of India	K4
CO4	Evaluate the important measures taken by Indian Government for the improvement of Education	K5
CO5	Compare the Economic and Scientific Development of India	K5

**K1 = Knowledge, K2 = Understanding, K3 = Application, K4 = Analysis and K5 = Synthesis and Evaluation**

### Mapping Course Outcome with PSO and PO

Out come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1	2	2				2	2	2	3	3	2			18
CO2	3	3	2	2	2	1	3		2	2	3	2	2	27
CO3	3	3	2	2	2	2	3		2	2	3	2	2	28
CO4	2	2	3	3	3	1	1	1	2	2	2	3	3	28
CO5	2	2	3	3	3	3	1	1	2	2	2	3	3	30
Grand Total of COs with PSO and POs														131
Grand total of COs with PSOs and POs 131														2.25
Mean Value of COs with PSO and POs = ----- = ----- = 2.25														
Number of COs relating with PSOs and POs 58														

Strong – 3 Medium – 2 Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.25</b>
<b>Observation</b>	<b>COs of India Since Independence Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514

DEPARTMENT OF HISTORY

Class : III B.A. History

Part : III Core – 13

Semester : VI

Hours : 75

Sub-Code : 22UHSD36

Credits : 04

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HISTORIOGRAPHY

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

Course Educational Objectives

To make the students to

1. Recognize the scope and purpose of History
2. Compare the relation between History and other social sciences
3. Analyse the research techniques in History
4. Evaluate the contributions of Historians
5. Appraise the Contributions of Indian Historians

Unit I

**What is History**

**15 Hours**

Meaning and Nature of History – Scope and Purpose of History – Definitions of History – Kinds of History – Uses and Abuses of History

Unit II

**History and other Disciplines**

**15 Hours**

Relation between History and other Social sciences – Auxiliary Sciences – Is History a Science or an Art?

Unit III

**A Study on Indian Historiographers**

**15 Hours**

Bana – Kalhana – Barani – J.N. Sarkar – R.C.Majumdar – K.A.Neelakandasasthiri – K.K.Pillai – K.Rajayan

Unit IV

**A Study on Historiographers**

**15 Hours**

Philosophy of History – Herodotus – Ranke – Hegel – Karl Marx – Arnold J Toyenbee – IbnKaldhun

Unit V

**Method of Writing History**

**15 Hours**

Selection of a topic – Collection of Data – Authenticity of facts – External Criticism – Internal Criticism – Synthesis – Arrangement of Thesis Documentation – Bibliography-Foot Notes-exposition

**Teaching Learning Methods**

Lecture Method

Power Point Presentation

Group Discussion

Seminar

Assignment

### Books for Study

1. Sreedharan: 'Text Book of Historiography (500 BC to AD 2000)', Orient Blackswan Publication, Hyderabad, 2004.
2. LaxmiJain : 'Historical Method and Historiography', VaguEdn Publication, Delhi, 2016.
3. HarbansMukhia, 'Historians and Historiography', Aakar Books, New Delhi, 2017.
4. SumitSarkar, Writing Social History, Oxford University Press, New Delhi, India, 2021.

### Books for References

1. Carr. E.H.: 'What is History?', Macmillan& Co. Ltd., London, 1962.
2. Rajayyan, K.: 'History its Theory and Method', 8<sup>th</sup>Edn, Ratna Publications, Madurai, 1999.
3. Sheik Ali.B.: 'History : Its Theory and Method', 2<sup>nd</sup>Edn, MacMillan India Ltd., Madras, 1984.
4. Subramanian, N.: 'Historiography and Historical Methods', 5<sup>th</sup>Edn, Ennes Publications, Vadipatti, 1993.
5. John Tosh, The Pursuit of History: Aims, Methods, and New Directions in the Study of Modern History, Routledge, London, UK, 2015
6. Peter Burke, What is Cultural History?, Polity Press, Cambridge, UK, 2004
7. Beverly Southgate, What is History For?, Routledge, London, UK, 2020

### Course Outcome

#### Students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Assess the scope and purpose of History	K3
CO2	Analyze the relation between History and other social sciences	K4
CO3	Point out the importance of the research techniques in History	K4
CO4	Discuss the salient features of the historical writings of World Historians	K5
CO5	Summarize the art of historical writings in India	K5

**K1 = Knowledge, K2 = Understanding, K3 = Application, K4 = Analysis and K5 = Synthesis and Evaluation**

### Mapping Course Outcome with PSO and PO

Out come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1	2	2				2	2	2	3	3	2	1	1	20
CO2	3	3	2	2	2	1	3	1	2	2	3	2	2	28

CO3	3	3	2	2	2	3	1		2	2	3	2	2	27
CO4	2	2	3	3	3	3	2		2	2	2	3	3	30
CO5	2	2	3	3	3	1	1		2	2	2	3	3	27
Grand Total of COs with PSO and POs														132
Grand total of COs with PSOs and POs 132														
Mean Value of COs with PSO and POs = ----- = 2.23														2.23
Number of COs relating with PSOs and POs 59														

Strong – 3 Medium – 2 Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.23</b>
<b>Observation</b>	<b>COs of Historiography Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625 514

DEPARTMENT OF HISTORY

Class	: III B.A. (History)	Part	: III Core – 14
Semester	: VI	Hours	: 75
Sub-Code	: 22UHSD46	Credits	: 04

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MAIN CURRENTS OF THE MODERN WORLD – II (CE 1919 - 1945 CE)

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives**

**To make the students to**

1. Recognize the Peace preservation after the First World War
2. Describe the rise of Communist Movement in the World
3. Critically analyze the Dictatorial and Imperialistic tendencies across the World
4. Evaluate the foreign policies of USA
5. Assess the causes for the outbreak of the World War I

**Note: The unit with the heading brief survey is not meant for elaborate study and so essay questions are not to be set from it.**

**Unit – I** **15 hours**

**Peace Preservation:**

League of Nations – Structure – Achievements – Failures – Mandate System.

**Map:** Mandated Territories – A, B, C territories.

**Unit – II** **15 hours**

**Towards Classless Society:**

Communist Movements in China Upto 1949 – Cultural Revolution – Causes – Course - Impac– Mao-Tse-Tung.

**Unit – III** **15 hours**

**Dictatorial and Imperialistic Tendencies**

Rise of Dictatorships – Mussolini – Hitler – Road to Japanese Imperialism – Manchurian Crisis – Second Sino – Japanese War.

**Unit – IV** **15 hours**

**USA's Foreign Policy**

USA's Foreign Policy since 1919 – Good Samaritan Policy -Big Brother –Big Stick Policy-Reasons for American Participation in World War-II.

**Unit – V** **15 hours**

**Second World War: Causes course and Results**

- Map:**
1. Possessions of Germany in Europe during World War-II.
  2. Japans position in Asia during World War-II.

### Books for Study

1. Paramasivam, M. &G. Sethuraman - History of China and Japan (2<sup>nd</sup> Ed). PannaiPathippagam, Madurai, 1985.
2. Thiyagarajan, J., - International Relations, Pavai Pathippagam, Madurai, 2002.
3. Mahajan, V.D. - Modern Europe since 1789, Chand & Co., New Delhi, 1980.

### Books for References

1. Darling Kindersley - History of the World, D.K. Publication, London, 1994.
2. Fisher, H.A.L., - History of Europe (2 Vols), Surjeet, New Delhi, 1986.
3. Hayes, C.J.H., - Contemporary Europe Since 1870, Surjeet Publications, New Delhi, 1982.
4. Lowe Norman - Mastering Modern World History (3<sup>rd</sup> Ed), Macmillan, Delhi, 1997.
5. MarshallSmelser - American History at a Glance, Barnes and Nobel, INC, New York, 1966.
6. Chris Harman, A Peoples History of the World (Delhi: Orient Longman, 2007)
7. Richard Overy, Complete History of the World (London: Harper Collins, 2006)
8. H.A. Davies, An Outline History of the World (Oxford: Oxford University Press, 2006)
9. K.A. Manikumar , A Colonial Economy in the Great Depression: Madras(1929 – 1937), (Hyderabad: Orient Longman, 2003).

### Teaching Learning Methods

Lecture Method

Power Point Presentation

Group Discussion

Seminar

Assignment

### Course Outcome

Students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Recall the League of Nations and the Peace preservation	K1
CO2	Summarize the rise of Communism in the World	K2
CO3	Analyze the Age of Imperialism and Dictatorship	K4
CO4	Criticize of USA with other World Countries	K5
CO5	Evaluate the Impact of World War II in International affairs	K5

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyse, K5-Evaluate, K6-Create**

### Mapping Course Outcome with PSO and PO

Out Come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1						3	2	2						7
CO2	3	2				2	3	2	2	2			2	18
CO3	3	3	2	2	2	1	2	2	2	3	3	2	2	29
CO4	2	2	2	3	3	2	3		2	2	2	3	3	27
CO5	2	2	2	2	2	1	2		2	2	3	2	2	24
Grand Total of COs with PSO and POs														105
Grand total of COs with PSOs and POs 105														2.18
Mean Value of COs with PSO and POs = ----- = 2.18														
Number of COs relating with PSOs and POs 48														

Strong – 3 Medium – 2 Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.18</b>
<b>Observation</b>	<b>COs of Main Currents of the Modern World II Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514

DEPARTMENT OF HISTORY

Class : III B.A. (History)

Part : III Core – 15

Semester : VI

Hours : 75

Sub-Code : 22UHSD56

Credits: 04

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INTERNATIONAL RELATIONS (SINCE 1945 CE)

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives**

**To Make the Students to**

1. Understand the importance of the basic concept of the study of International relations.
2. Know about the structure and achievements of the UNO.
3. Understand the problems between states that affected the world.
4. Evaluate the foreign policies of India.
5. Identify the problems of the Developing nations.

**Unit – I**

**15 hours**

**Importance of the Study of International Relations**

Meaning – Definition Scope - Concept - Balance of Power – Collective Security –WTO – International Law – Neo Colonialism – Terrorism -

**Unit – II**

**International Organisation**

**15 hours**

U.N.O. Aims – Structure – Achievements – Failures – Regional Organisations – Common Wealth of Nations – NATO- Warsaw Pact- CENTO-SEATO- ANZUS - OAU- OPEC--EEC- Brexit - Five Eyes Alliance – OIC – MEDO -

**Unit – III**

**15 hours**

**Some Major Issues of the 20<sup>th</sup> Century –**

Arab – Israel Conflict – Vietnam War – Korean War – Gulf War- Kuwait Issue and developments.- Fall of Twin Tower- Syrian crisis- ISIS- Refugees problem- South China Sea problem

**Unit – IV**

**15 hours**

**India Since 1945** – NAM- Foreign Policy with USA and Russia – Indo – Chinese – Conflict – Indo-Pak Relations – Indo-Sri Lankan Relations- Tamil Elam War -2009- Regional Organisations- SAARC-BRICS – ASEAN - SCO

**Unit – V**

**15 hours**

**Problems of the Developing Nations** – North – South Dialogue – Impact of Atom and Space race – India’s Nuclear Policy- People’s Movement against Nuclear Energy Indian Missiles Programme- NPT – SALT I – SALT II – SALT III

### Books for Study

- 1.KeswaniHemchand, S. - International Relations in Modern World (1900-1988), Himalaya Publishers, Mumbai, 1995.
- 2.Thiyagarajan, J., - International Relations, Pavai Pathippagam, Madurai, 2002.
- 3.Mahajan, V.D., - International Relations Since 1900, S. Chand & Co., New Delhi, 1990.

### Books for References

- 1.Carr, E.H., - International Relations between the World Wars, Palgrave, New York, 1985.
- 2.Chester Bowles, - Ambassador's Report, Comet Books, London, 1954.
- 3.Dhar, S.N., - International Relations and World Politics, Kalyani Publishing House, New Delhi,
- 4.Johari, J.C., - International Relations and Politics, Sterling Publishers, New Delhi, 1998.
- 5.PremArora&PrakashChander , Comparative Politics and International Relations, Cosmos bookhivePvt Ltd; 31st edition 2015.
6. Pavneet Singh; *International Relations*, McGraw Hill Publication, Delhi, 2019
7. Stephen McGlinchey, *International Relations*, University of the West of England, 2016
8. Andrew Hurrell and AnandMenon, eds., *The Oxford Handbook of Modern Diplomacy*, Oxford University Press, Oxford, UK, 2021

### Course Outcome

Students will be able to

Course Outcome	Course Outcome	Knowledge Level
CO1	Explain the basic concept of the study of International relations.	K3
CO2	Analyse the achievements of the UNO.	K4
CO3	Criticise the major issues of the 20 <sup>th</sup> century and its impact	K4
CO4	Analyze the importance of friendship relations of USA with other World Countries.	K4
CO5	Evaluate the problems of the Developing nations.	K5

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyse, K5-Evaluate K6-Create**

### Mapping Course Outcome with PSO and PO

Out come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1	2	2				1	2	2	3	3	2			17
CO2	3	3	2	2	2	2	1		2	2	3			22

CO3	3	3	2	2	2	1	2		2	2	3			22
CO4	3	3	2	2	2	1	1		2	2	3			21
CO5	2	2	3	3	3	1	1		2	2	2	3	3	27
Grand Total of COs with PSO and POs														109
Grand total of COs with PSOs and POs 109														2.18
Mean Value of COs with PSO and POs = ----- = 2.18														
Number of COs relating with PSOs and POs 50														

Strong – 3    Medium – 2    Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.18</b>
<b>Observation</b>	<b>COs of International Relations Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625 514

DEPARTMENT OF HISTORY

Class : III B.A. (History)

Part : III Core – 16

Semester: VI

Hours : 75

Sub-Code: 22UHSD66

Credits : 04

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HUMAN RIGHTS

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives**

**To make the students to**

1. Understand the meaning and historical development of human rights
2. Create awareness on Rights against discrimination, inequality, and exploitation in a Rights based approach.
3. Analyses the role of UNO in safeguarding the human rights and the various Declarations that were signed for the promotion and protection of Human Rights.
4. Analyse the constitutional provisions and Civil societies in India for the protection of human rights violations.
5. Study about the famous personalities who contributed for human rights evolution throughout the world.

**Unit – I:**

**15 hours**

**Historical Roots and Growth of Human Rights**

Definition Concept and Meaning - Types of Human Rights. – Historical Evolution – Magna Carta, Bill of Rights, French rights of declaration of man

**Unit – II:**

**15 hours**

**Social and Sectoral Rights and Violations**

Women - Children - Dalits - Tribals - Minorities – Slavery - Environment (Laws and Acts)

**Unit – III:**

**15 hours**

**Human Rights Protection**

National and Global Mechanism – National - Preamble of Indian Constitution – Fundamental Rights and Duties – Directive Principles of State Policy - Human Rights Commissions – International - U.N. conventions and Protocols - Mechanisms of the U.N.O. UDHR

**Unit – IV:**

**15 hours**

**Ways of Responding to Human Rights Challenges under Democracy**

Legal Bases, Right to Information - Human Right Organizations- Civil Society Groups-

**Unit – V:**

**15 hours**

**Human Rights and Inspiring Personalities**

Rousseau, Abraham Lincoln, Karl Marx, Martin Luther King. Jr, Dr. Ambedkar, V.R. Krishna Iyer, Medha Patkar, Irom Sharmila

### Teaching Learning Methods

1. Lecture Method
2. ICT
3. Seminars
4. Quiz
5. Case Study

### Book for Study

1. Maurice Carnston, 1973, What are Human Rights?, The Bodley Head Ltd, London.
2. Lovis Henkin, 1978, The Rights of Man today. Stevens & Sons, London
3. V.R. Krishna Iyer, 1984, Human Rights And Law. Vedpal
4. Law House, Indore
5. Jack Donnelly, 1985, The Concept of Human Rights. Croom Helm, London.

### Books for References:

1. Bami Bargohain, - Human Rights, Social Justice and Political Challenge, Kaniska Publishers, New Delhi, 1999.
2. Darren O' Byrne - Human Rights: An Introduction, Pearson Education, New Delhi, 2003.
3. Desai, A.R., - Repression and Resistance in India, Popular Prakashan, Bombay, 1990.
4. Desai, A.R., - Violation of Democratic Rights in India (Ed.), Popular Prakashan, Bombay, 1986.
5. Dev Arjun, & Indirani Arjun Deva, Human Rights, A Source Book, Delhi, 1996.
6. Kumar Das Ashish, - Human Rights in India, Mohanti Pransant Kumar & Sons, New Delhi, 2007.
7. Muthuraj Raja, - Human Rights, Sriyar Publications, Trichy, 1996.
8. Roy Ashina, - Human Rights of Women, Raja Publications, New Delhi, 2003.

### Teaching Learning Methods

Lecture Method  
Power Point Presentation  
Group Discussion  
Seminar  
Assignment

### Course Outcome

#### Students will be able to

Course Outcome No	Course Outcome	Knowledge Level
CO1	Demonstrate the meaning and historical development of Human Rights	K3
CO2	Explain about Rights against discrimination, inequality, and exploitation in Rights based approach.	K3

CO3	Point out the role of UNO in safeguarding the human rights and the various Declarations that were signed for the promotion and protection of Human Rights	K4
CO4	Judge the constitutional provisions and Civil societies in India for the protection of human rights violations.	K5
CO5	Discuss the ideas of the famous personalities who contributed for human rights evolution throughout the world	K5

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyse, K5-Evaluate, K6-Create**

**Mapping Course Outcome with PSO and PO**

Out Come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1	2	2				1	2	2	3	3	2			17
CO2	2	2				2	2	2	3	3	2			18
CO3	3	3	2	2	2	1	1		2	2	3	2	2	25
CO4	2	2	3	3	3	1	1		2	2	2	3	3	27
CO5	2	2	3	3	3	1	1		2	2	2	3	3	27
<b>Grand Total of COs with PSO and POs</b>														114
Grand total of COs with PSOs and POs 114														2.19
Mean Value of COs with PSO and POs = ----- = 2.19														
Number of COs relating with PSOs and POs 52														

Strong – 3 Medium – 2 Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.19</b>
<b>Observation</b>	<b>COs of Human Rights Strongly related with PSOs and POs</b>		

Class : All B.A./B.Sc.

Part : SLC

Semester : VI

Hours : -

Sub-Code : 22UHSSL6

Credits: 3

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**INDIAN CONSTITUTION**

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives**

To make the students to

1. Understand the basic concepts of the art of governing the states.
2. Describe the powers and functions of the Union Executive.
3. Examine the process of Law Making in India.
4. Assess the powers and functions of the Supreme Court.
5. Evaluate the functioning of Election Commission.

**Unit – I:**

**Indian Constitution**

Salient Features – Preamble – Fundamental Rights and Duties – Directive principles of State Policy – Distribution of powers – Centre-State Relations – Article 356 – Amendments.

**Unit – II:**

**Union Executive**

President – Vice-President – Powers – Functions – Prime Minister – Cabinet – Powers and functions.

**Unit – III:**

**Union Legislature**

Lok Sabha – Rajya Sabha – Process of Law Making – Functions – Powers – Privileges.

**Unit – IV:**

**Indian Judiciary**

Organisation – Powers and functions – Judicial Review.

**Unit – V:**

**Election Commission**

Power and Functions - Reforms – Party System – Pressure Groups.

**Books for Study:**

1. Badi R.V., Indian Constitution, Vrindha pub, Delhi, 2005.
2. Competitive Success, Constitution of India – At a Glance, New Review, Delhi, 13<sup>th</sup> Ed., 2002.
3. Kasthuri, J., Modern Governments, I ed, Ennes Publication, Udumalpet, 1998.

4. Laxmikanth. M, Indian Polity (for UPSC), TATA McGraw Hill, Delhi, 2004.
5. Mahajan. V.D., Select Modern Governments, S. Chand & Co., New Delhi, 1984.

**Books for References:**

1. Agarwal, R.C., Modern Indian Constitution and Administration, S. Chand & Co., New Delhi, 6<sup>th</sup> Ed., 1994.
2. BasuDurga Das, Introduction to the constitution of India, 19<sup>th</sup>ed, Wadhwa& Company, Delhi, 2005.
3. BhagwanVishoonandBhushanVidya, World Constitutions, III Revised, 19<sup>th</sup>ed , Sterling Publication, Bangalore, 1987.
4. Raj Hans, Constitution of India, Surjeet Publication, Delhi, 1990.
5. RajaramKalpana (ed), Indian Policy, Revised ed, Spectrum Books New Delhi, 2003.

**Teaching Learning Methods**

Lecture Method

Power Point Presentation

Group Discussion

Quiz

Seminar

Assignment

**Course Outcome**

**Students will be able to**

<b>Course Outcome No.</b>	<b>Course Outcome</b>	<b>Knowledge Level</b>
CO1	Recall the salient features of the Indian Constitution	K1
CO2	Classify the powers and functions of the President and the Prime Minister of India.	K2
CO3	Analyze the exercises of the parliament of India	K4
CO4	Summarize the functioning of the Indian Judiciary	K5
CO5	Evaluate the role of Election Commission in conducting fair and free elections in India.	K5

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyse, K5-Evaluate, K6-Create**

### Mapping Course Outcome with PSO and PO

Out Come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1	1	2	3	3	3	3	2	2						19
CO2	2	2	2	2	2	2	3	3	2	2	2	2		26
CO3	1	2	2	2	2	1	2	2	2	2	3	2	2	25
CO4	3	1	2	3	3	2	1		2	2	2	3	3	27
CO5	2	2	3	3	3	2	1		2	2	2	3	3	28
Grand Total of COs with PSO and POs														125
Grand total of COs with PSOs and POs 125														2.19
Mean Value of COs with PSO and POs = -----=-----= 2.19														
Number of COs relating with PSOs and POs 57														

Strong – 3 Medium – 2 Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of COs with PSO and POs</b>			<b>2.19</b>
<b>Observation</b>	<b>COs of Indian Constitution Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514

DEPARTMENT OF HISTORY

Class	: III B.A. (History)	Part	: Value Added
Semester	: II & IV	Hours	: 30
Sub-Code	:	Credits	:

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**Food Heritage of India**

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives:**

**To Make the students to**

1. Appreciate the cultural diversity of Indian food heritage, exploring regions like Mughal, Udupi, Hyderabad, and Chettinad.
2. Identify essential ingredients in Indian cooking, including cereals, pulses, spices, and more.
3. Learn and use Indian culinary terms for both food items (e.g., idli, dosa) and equipment (e.g., tawa, chule).
4. Explore the unique food heritage of Tamil Nadu, covering cereals, pulses, fruits, tubers, and non-vegetarian elements.
5. Develop practical skills by preparing selected recipes using various cooking methods like steam-boiling and deep-frying.

**UNIT: I Heritage**

**6 Hours**

Meaning – Indian Geography and food heritage – India a land for all reasons – Indian States and regional recipes – Mughal – Udupi – Hyderabad – Chettinad – others – Tourism perspectives – Chinese – Western Cooking – basics

**UNIT: II Ingredients in Indian Cooking**

**6 Hours**

Cereals – Pulses – Legumes – Leafs and roots – tuber – nuts – oil seeds – fruits – fish – milk – condiments – spices.

**UNIT: III Indian Culinary Terms**

**6 Hours**

a) Food items - aalu – atta – barfi – bonda – chapatti – idli – dosa – ladu – mittai – pulao – briyani – keema – pan – vettrilai - kuzhambu – sabji – rasam – dahi – others. b) Equipments – tawa – chule – tandoori – kattori – kadai – manpanai – thale.

**UNIT: IV Food Heritage of Tamil Nadu**

**6 Hours**

Saivam – Thaniyam – (cereals) – rice – aval – kambu – varagu – keppai – samai – paruppu(pulse) – ulundu – pasi- payiru – mochai – avarai – Thattai. Kani (fruits) Ma – Pala – Vazhai. Kizhangu (tuber) – sirukizhangu – sarkaraivalli – panaiporul (Palm products)-Pathaneer – karuppatti – karkandu – Asaivam(Non-Veg) – Kozhi – Aadu – Meen.

**UNIT: V Practicals (preparation of selected recipes)**

**6 Hours**

Moist heat method: – a) Steam boiled-Idli – Kozhukattai – Idiappam – Puttu b) Water mixed – pongal – kanji – kuzh -kazhi – kasayam – Nattukozhi and AyiraiMeenkuzhambu

Dry heat method:a)Deep fry – vada – vadam – murukku -adirasam –poori.  
Shallow fry: Paniyaram – Aappam – meen or Karuvadu fry.

**Book for Study:**

1. Damodaran, **SamayalKalanjiam** (Tamil)KarpagamPuthagalayam, Chennai, 2010.
2. Michael Hall.C and others, (Ed), **Food Tourism Around the World**, Elsevier, New Delhi, 2006.

**Book for References:**

1. Palsuvai Malar, **TuticorinMagalirMandram**, Tuticorin,2002.
2. Philip Thangam. E, - **Modern Cookery**, Vol.I, 5thed, Orient Longman Private Limited, New Delhi,2003

**Teaching Learning Methods**

- Lecture Method
- Power Point Presentation
- Group Discussion
- Seminar
- Assignment

**Course Outcome**

Students will be able to

<u>Course Outcome No.</u>	<u>Course Outcome</u>	<u>Knowledge Level</u>
CO1	Understand the diverse food heritage of India and its cultural tourism significance.	K1
CO2	Illustrate essential ingredients in Indian cooking and their roles in traditional cuisine	K2
CO3	Analyze the Indian culinary terms for food items and cooking equipment effectively.	K4
CO4	Explore the unique food heritage of Tamil Nadu and its cultural significance.	K5
CO5	Develop practical culinary skills using various cooking methods.	K5

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyse, K5-Evaluate, K6-Create**

**Mapping Course Outcome with PSO and PO**

Out come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of CO's with PSO's & POs
CO1						3	2	2	2	2				11
CO2						2	3	3	2	2				12
CO3	3	3	2	2	2	2	3		2	3	3	2	2	29

CO4	3	3	3	3	3	1	3		2	2	3	3	3	32
CO5	2	2	3	3	3	2	2		2	3	3	3	3	31
Grand Total of COs with PSO and POs														115
Grand total of COs with PSOs and POs 115														2.5
Mean Value of COs with PSO and POs = ----- = ----- =														
2.5														
Number of COs relating with PSOs and POs 46														

Strong – 3 Medium – 2 Low - 1

<b>Mapping Scale</b>	<i>1</i>	<i>2</i>	<i>3</i>
<b>Relation</b>	<i>0.01 to 1.0</i>	<i>1.01 to 2.0</i>	<i>2.01 to 3.0</i>
<b>Quality</b>	<i>Low</i>	<i>Medium</i>	<i>Strong</i>
<b>Mean Value of COs with PSO and POs</b>			2.5
<b>Observation</b>	<b><i>COs of India Struggle for Freedom Strongly related with PSOs and POs</i></b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514

DEPARTMENT OF HISTORY

Class	: III B.A. (History)	Part	: Value Added
Semester	: II & IV	Hours	: 30
Sub-Code	:	Credits	:

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HERITAGE TOURISM OF INDIA

(Outcome based syllabus under CBSE structure for the students admitted from the academic year 2022 - 2023)

Course Educational Objectives

To make the students

- Able to define the concept and Definition of heritage.
- Classify various Pilgrimage Centers in India.
- Generalize the richness of Fine Arts and Performing Arts in India.
- Generate the values of Fairs and Festivals of Indian.
- Appraise the rich natural and ancestral heritage of India.

**Unit-I: Tourism-Meaning of Heritage (6 hours)**

- i) Manmade - natural - richness of Indian Heritage - Indiaal and for all seasons and all reasons.
- ii) **Field visit to a local heritage monument** - Jain caves - Hindu temples etc.

**Unit-II: Places of Religious Importance (6 hours)**

**Buddhist**-Bodh Gaya **Jain**-Dilwara Temple **Hindu**-Kasi-Rishikesh-Haridwar-Puri-Konark--Tiruvannamalai **Muslim**-Nagore-Yerwadi **Sikh**-Amritsar **Christian**-Goa-Velankanni.

**Unit-III: Fine Arts and Performing Arts (6 hours)**

Classical Dances-Bharatham-Kathak-Kathakali-Kuchipudi-Odissi-Manipuri **Folk dances**-Karagam-Mohiniattam-Thullal-Oyil-Kummi-Thevarattam-**Music-Classical-Karnatic**-T.K.Pattammal-M.S.SubbuLakshmi-BadmaSubramaniam.**Hindustani**-PanditBhimSen-SitarRaviSankar-**Drama**-SankaradasSwamigal-PammalSambandaMudaliyar-**Handicrafts** -Poompuhar-Kanchipuram-Banaras.

**Unit-IV: Fairs and festivals (6 hours)**

**Religious festivals- Hindu Festivals**- Deepawali-Mahamaham-Dasarah-KumbaMela  
**-Islamic and Christian Festivals**-Santhanakudu(Nagore)(Sufi influence)-Fr.Beschi's Inculturation-**Secular festivals**- Onam-Baisaki -Pongal -Jallikkattu.

**Unit-V : Great Monuments and World Heritage Symbols:**

**(6 hours)** Ajanta-Ellora-Qutbminar-Fatepursikri-TajMahal-

RedFort-Parliament-RashtrapathiBhavan-IndiaGate-

Big Temple of Tanjore-Mahabalipuram-Madurai Meenakshi Temple.

**Book for Study**

1. Edith Tomori, History of Fine Arts in India & the West, Orient Black Swan, New Delhi, 2004.

2. Sharmin Khan, History of Indian Architecture: Buddhist, Jain and Hindu Period, CBS Publishers & Distributors, New Delhi, 2014.
3. Lakshmana Chettiyar, S.M., **Folklore of Tamil Nadu**, National Book Trust, New Delhi, 1997.

#### Book for References

1. Basham, A.L., **Wonder That was India**, Rupa & Co., Delhi, 1989.
2. Brown Percy, **Indian Architecture**, D. B. Tharapone Wala & Sons, Bombay, 1955.
3. Mahajan, V.D., **History of India (Vol.2)**, S. Chand & Co, New Delhi, 2003.
4. Nehru Jawaharlal, **Discovery of India**, Asia Publications, Delhi, 2004.
5. Thopar Romila, **History of India (Vol.1)**, Penguin Books, New Delhi, 1966.

#### Teaching Learning Methods

- Class Lecture
- Power Point Presentation,
- Group Discussion,
- Seminar,
- Study Trip to Heritage Monuments,
- Assignment etc.,

#### Course Outcome

##### The students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Recall the basic concept and definition of heritage	K1
CO2	Justify the heritage significance of various Pilgrimage Centres in India.	K2
CO3	Differentiate the richness of Fine Arts and Performing Arts in India	K4
CO4	Synthesize the Glorious heritage values of Fairs and Festivals of Indian	K5
CO5	Recognize the values of Great Monuments and World Heritage Symbols of India and transform it into our future generations.	K5

**K1–Remember, K2–Understand, K3–Apply, K4–Analyse, K5–Evaluate K6–Create**

### Mapping Course OutcomewithPSOandPO

Out come	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sumof CO's with PSO's & POs
CO1					1	1	3	2	2	2			1	12
CO2	2	2			3	2	3	3	2	2	2			21
CO3	3	2	2	2	1	2	2	2	2	3	2	2	2	27
CO4	2	2	3	3	3	3	2		2	2	2	1	1	26
CO5	2	2	3	3	3	2	3		2	2	2	3	3	30
GrandTotal of COs withPSOandPOs														116
Grandtotalof COswithPSOsandPOs												116		
MeanValueofCOswithPSOandPOs=-----=2.18														
Numberof COsrelatingwithPSOsandPOs												53		

Strong-3 Medium- 2 Low-1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01to1.0</b>	<b>1.01to2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>MeanValueofCOS withPSOand POs</b>			<b>2.18</b>
<b>Observation</b>	<b>COSof HeritageTourismof India Stronglyrelated with PSOs andPOs</b>		

**DEPARTMENT OF ECONOMICS**





ARUL ANANDAR COLLEGE (AUTONOMOUS),  
KARUMATHUR - 625514  
Department of Economics (Centre for Research)

Outcome Based CBCS Structure for the students to be admitted from the academic  
Year 2022-23  
B.A. Economics

Part	Subject Code	Title of the Course	Hrs	Credit
<b>I Semester</b>				
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil/ Hindi/French	06	4
II	22UENA11 22UENB11	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream – B	05	4
III	22UECC11	Core - 1 Microeconomics – I	06	5
	22UECC21	Core - 2 Macroeconomics – I	06	5
	22UECA11	Allied – 1 Economic Statistics – I	05	4
IV	22UFCE11	FC – Personality Development	01	01
	22UCSH12	Communication Skills - I	01	
	22UBRC11	Bridge Course	-	1
V	22UNCC/NSS/ PHY.EDU/YRC/ ROT/ACF/ NCB12	Extension Activities : NSS/NCC/Phy.Edn./ YRC/ROTARACT/AICUF/Nature Club	-	-
<b>Total</b>			<b>30</b>	<b>24</b>
<b>II Semester</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil /Hindi /French	06	4
II	22UENA22 22UENB22	English through Prose & Poetry -Stream–A English through Prose & Poetry -Stream–B	05	4
III	22UECC32	Core - 3 Microeconomics – II	06	5
	22UECC42	Core - 4 Macroeconomics – II	06	4
	22UECA22	Allied - 2 Economic Statistics – II	05	4
IV	22UFCH22	FC - Social Responsibility and Global Citizenship	01	1
	22UCSH12	Communication Skills - II	01	1
V	22UNCC/NSS/ PHY.EDU/YRC/ ROT/ACF/ NCB12	Extension Activities: NSS/NCC/Phy.Edn./ YRC/ROTARACT/AICUF/Nature Club	-	1
<b>Total</b>			<b>30</b>	<b>24</b>

<b>III Semester</b>				
I	22UTAL13/ 22UHNL13/ 22UFNL13	Tamil /Hindi /French	06	4
II	22UENG33	English through Literature – I	06	4
III	22UECC53	Core - 5 Monetary Economics	05	4
	22UECA33	Allied – 3 Principles of Accountancy	05	4
	22UECE13	Core Elective - 1 Managerial Economics / Principles of Management	04	3
IV	22UECN13	Non-major Elective - 1 : Elements of Indian Economy	03	2
	22UFCE33	FC - Environmental Studies	01	01
V	22UNCC/NSS/ PHY.EDU/YRC/ ROT/ACF/ NCB24	Extension Activities: NSS/NCC/Phy.Edn./ YRC/ROTARACT/AICUF/Nature Club	-	-
	22UARE14	ARISE	-	-
<b>Total</b>			<b>30</b>	<b>22</b>
<b>IV Semester</b>				
I	22UTAL14/ 22UHNL14/ 22UFNL14	Tamil /Hindi /French	06	4
II	22UENG44	English through Literature – II	06	4
III	22UECC64	Core - 6 Banking	05	5
	22UECA44	Allied - 4 Accounting for Management	05	4
	22UECE24	Core Elective - 2 Quantitative Aptitude / Verbal and Non-Verbal Reasoning	04	3
IV	22UECN24	Non–major Elective – 2 : Comparative Economic System	03	2
	22UFCH44	FC - Religious Literacy and Peace Ethics	01	1
V	22UNCC/NSS/ PHY.EDU/YRC/ ROT/ACF/ NCB24	Extension Activities: NSS/NCC/Phy.Edn./ YRC/ROTARACT/AICUF/Nature Club	-	1
	22UARE14	ARISE	-	1
<b>Total</b>			<b>30</b>	<b>25</b>

<b>V Semester</b>				
III	22UECC75	Core - 7 Fiscal Economics	05	5
	22UECC85	Core - 8 Mathematical Methods	05	4
	22UECC95	Core - 9 International Economics	05	4
	22UECD05	Core -10 History of Economic Thought	05	4
	22UECD15	Core - 11 Marketing Management	05	4
	22UINT15	Internship (Holidays – 25 Days)	0	1
IV	22USBZ15	Skill Based Elective - I : Fundamental of Computer, Internet and Office Automation (Theory)	01	1
	22USBY15	Skill Based Elective - I Fundamental of Computer, Internet and Office Automation (Practical)	02	1
	22USSI16	Soft Skills	02	-
<b>Total</b>			<b>30</b>	<b>24</b>
<b>VI Semester</b>				
III	22UECD26	Core - 12 Indian Economy	05	5
	22UECD36	Core - 13 Mathematical Economics	05	4
	22UECD46	Core – 14 Development Economics	05	4
	22UECD56	Core - 15 Environmental Economics	05	4
	22UECD66	Core – 16 Demography	05	4
IV	22USBZ26	Skill Based Elective - II : Web Design (Theory)	01	1
	22USBY26	Skill Based Elective - II : Web Design (Practical)	02	1
	22USSI16	Soft Skills	02	2
<b>Total</b>			<b>30</b>	<b>25</b>

Semester	I	II	III	IV	V	VI	Total
Credits	24	24	22	25	24	25	144

#### Self-Learning Courses - Additional Credits

Semester	Sub. Code	Title	Credits
III	22UECSL3	Economics of social problems in India	3
IV	22UECSL4	Labour problems and social welfare	3
V	22UECSL5	Marxian economics	3
VI	22UECSL6	Economic reforms in India	3

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR - 625514

DEPARTMENT OF ECONOMICS

Class	: B.A. Economics	Part	: CORE-7
Semester	: V	Hours	: 75
Subject Code	: 22UECC75	Credits	: 05

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FISCAL ECONOMICS

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)

Course Educational Objectives (CEO) :

1. To introduce the scope of public finance
2. To impart the knowledge of public revenue and expenditure
3. To educate about the technicalities of direct and indirect taxes
4. To teach the need and management of public debt
5. To enlighten the federal finance system

**Unit I – Public Finance: (15 hours)**

Public Finance: Meaning - Definitions – Importance – Scope – Role of Public Finance - Public Goods – Meaning – Characteristics – Topology of goods - Social Goods - Merit Goods – Demerit goods - Private Goods vs Public Goods – Major fiscal function – Dalton’s views on Principle of Maximum Social Advantage

**Unit II - Public Expenditure: (15 hours)**

Public Expenditure: Meaning - Definition – Classification - Canons– causes for the growth of public expenditure - Control of public expenditure – Effects of public Expenditure – Role of Public Expenditure in economic development

**Unit III - Public Revenue: (15 hours)**

Public Revenue: Meaning – Definition - sources – classification – Principles of Public Revenue – Significance of Public Revenue

Tax: Meaning – Cannon of Taxation – Characteristics of Good Taxation – Aims of Taxation– Impact and incidence of taxation: Meaning – Direct taxes and Indirect taxes: Merits and Demerits - Proportional, Progressive, Regressive taxation – Taxable capacity: Meaning – Types – Significance of Taxable capacity - Factors determining Taxable capacity

**Unit IV - Public Debt: (15 hours)**

Public Debt: Meaning– Causes– Classification– Importance– Burden of public debt – Redemption of public debt – Effects of public debt – Principles of Public Debt Management – Ricardian Equivalence

**Unit V - Budget: (15 hours)**

Budget: Meaning – Characteristics of a good budget – Principles of budgeting – Functions of a Budget – types of budget – Budgetary procedure – Zero based budgeting – Finance Commissions - Structure - Vertical and Horizontal Devolution Criteria of 15 Finance Commission - Recommendation of 15<sup>th</sup> finance Commission

### **Books for Study:**

1. Tyagi, B.P., Public Finance, Jai Prakash Nath & Co, Meerut, 2021.
2. Vaish, M.C., Public Finance, Allied Publishers Pvt Ltd, New Delhi, 2021
3. John Kennedy, M, Public Finance, PHI, New Delhi, 2019

### **Books for Reference:**

1. Chelliah, Raja, J, Fiscal Policies in Developed Countries, Himalaya Publishing House, Mumbai, 2015.
2. Dalton, H, Routledge and Kegan Paul, Principles of Public Finance, Allied Publications, New Delhi., 2000.
1. Musgrave, R.A, Theory of Public Finance, McGraw Hill, Tokyo, 2000.

### **Teaching and learning methods**

- Lecture and tutorial
- Newspaper cutting
- Survey Reports
- Power point
- Brainstorm
- Quiz
- ICT Tools

### **Course Outcome**

After completion of course Fiscal economics the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Comprehend the scope of public finance	K2
CO <sub>2</sub>	Outline the sources of public revenue	K4
CO <sub>3</sub>	List out the causes of public expenditure	K3
CO <sub>4</sub>	Analyse the public debt	K4
CO <sub>5</sub>	Evaluate the budget and fiscal policy	K4

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K5= Synthesis

### **Mapping of CO with PO and PSO**

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs& POs	
CO1	2	3	2	2	1	3	3	2	-	1	2	2	1	24	
CO2	2	3	2	2	1	3	3	2	-	1	2	2	1	24	
CO3	2	3	2	2	1	3	3	2	-	1	2	2	1	24	
CO4	3	3	3	2	2	3	2	1	1	2	2	2	1	27	
CO5	3	3	3	2	2	3	3	2	2	2	2	2	1	30	
Grand total of COs with PSOs and POs														129	
Mean Value of COs with PSO and POs =														$(\frac{129}{62})$	2.08

$$\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} =$$

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs Observation			2.08
	<b>COs of Fiscal Economics Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625514

DEPARTMENT OF ECONOMICS

Class	: B.A. Economics	Part	: CORE-8
Semester	: V	Hours	: 75
Subject Code	: 22UECC85	Credits	: 04

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MATHEMATICAL METHODS

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives (CEO) :**

1. To introduce fundamental concepts in Mathematics
2. To provide a mathematical background to solve linear equations
3. To familiarise the technicalities involved in the mathematical calculations
4. To deal with the well-defined collections of objects
5. To enhance the knowledge of matrices

**Unit – I: Functions (15 hours)**

Mathematical Methods: Meaning, Simple Functions: Meaning - Graphs of the Type - Straight Line – Quadratic – Exponential – Logarithmic – Equations of Straight Line: Slope-Intercept Form – Slope-Point Form – Two Point Form – Intercept Form – General Form – Parallel Straight Line – Perpendicular Straight Line.

**Unit–II Equations (15 hours)**

Equations: Meaning – Finding the Solutions of Linear and Simultaneous Equations: Three variables - Equations of the Second Degree in Two Variables and Solutions

**Unit–III Exponents, Logarithms, Permutations and Combinations (15 hours)**

Exponents – Logarithms: Definitions - Formula (Product, Quotient, Exponents no proof) Calculations using Tables Permutations and Combinations – Simple Problems – Binomial Expansion

**Unit – IV Matrices (15 hours)**

Matrix: Meaning – Types of Matrices - Addition and Subtraction of Matrix – Matrix Multiplications –Transpose of a Matrix – Inverse of a Matrix – Solution of Linear Equations by Matrix Method – Cramer’s Rule

**Unit – V: Differential Calculus (15 hours)**

Differentiation: Meaning – Basic Rules - Successive Differentiation of the Functions up to Second Order - Partial Differentiation -Total Differentiation

Maxima and Minima –Extreme Values – Maxima and Minima with Constraints

**Books for Study:**

1. Metha, B.C. & Madnani, Mathematics for Economics, S.Chand, New Delhi, 2017
2. D. Bose, An Introduction to Mathematical Methods, Himalaya Publishing House, Mumbai, 2019
3. Nancy Joshi RC, Mathematical Methods in Economics – I, Vishal Publishing Co, Punjab, 2019

### Books for Reference:

1. Edward T Dowling, Schaum's Outline series Introduction to Mathematical Economics, , McGraw-Hill, New Delhi, 2021
2. Chiang C Alpha and Wainwright Kevin, McGraw Hill Education; New Delhi 2017
3. Dowling T Edward, Schaum's Outline of Introduction to Mathematical Economics, McGraw-Hill Education, New Delhi, 2011

### Teaching and learning methods

- Chalk and Talk
- Power point
- Brainstorm
- Quiz
- Follow up exercises
- Snap test

### Course Outcome

After completion of course Mathematical Methods the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Draw and calculate the slope of the curves	K3
CO <sub>2</sub>	Solve the linear equations	K3
CO <sub>3</sub>	Determine the logical reasoning by applying permutations and combinations	K2
CO <sub>4</sub>	Solve the system of linear equations using Matrices	K4
CO <sub>5</sub>	Apply differentiation techniques to optimize economic variables	K3

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K5= Synthesis

### Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs	
CO1	3	2	2	1	2	3	3	-	-	2	3	-	2	23	
CO2	3	2	2	1	2	3	3	-	-	2	3	-	2	23	
CO3	3	3	2	1	2	3	3	-	-	2	3	-	2	23	
CO4	3	2	2	1	2	3	3	-	-	2	3	-	2	23	
CO5	3	2	2	1	2	3	3	-	-	2	3	-	2	23	
Grand total of COs with PSOs and POs														115	
Mean Value of COs with PSO and POs =													$(\frac{115}{50})$	2.3	
$\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} =$															

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.3
Observation	<b>COs of Mathematical Methods Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR - 625514

DEPARTMENT OF ECONOMICS

Class	: B.A. Economics	Part	: CORE-9
Semester	: V	Hours	: 75
Subject Code	: 22UECC95	Credits	: 04

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INTERNATIONAL ECONOMICS

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)

Course Specific Objectives (CSO):

1. To know the importance of trade in an economy
2. To familiarize with the concepts related to International Trade.
3. To recall the gains from trade.
4. To summarise the concept of foreign exchange and balance of payments
5. To list the various convergence of trade policies in India

**Unit – I: International Trade and Theories of International Trade (15 hours)**

International Economics: Meaning – Scope–Differences between Interregional and International Trade

Theories of International Trade: Mercantilist views - Adam Smith's Absolute Cost Advantage – Comparative Cost – Haberler's Opportunity Cost Theory- Heckscher - Ohlin Theory– Superiority of Heckscher - Ohlin Theory over Classical theory - Leontief Paradox – Inter and Intra-Industry Trade (Concepts only)

**UNIT – II: Gains from Trade and Terms of Trade (15 hours)**

Gains from Trade: Meaning - Factors Determining the Gains from trade - Terms of Trade - Meaning – Types - Factors Affecting Terms of Trade – Prebisch – Singer thesis – Dutch Disease

**UNIT – III Commercial Policy (15 hours)**

Free Trade: Meaning – Case for and against Free Trade – Protection: Meaning – Case for and against Protection – Tariff: Meaning – Types – Effects of Tariff – Quotas: Meaning – Types – Effects of Quotas – Stages of Economic Integration – Dumping: Meaning – Forms – Objectives – Anti Dumping Measures

**UNIT – IV: Foreign Exchange (15 hours)**

Foreign Exchange: Meaning – Transaction in the foreign exchange market - Determination of Exchange Rate - Theories of Exchange Rate: Mint Parity Theory - Purchasing Power Parity Theory – Causes of Fluctuations in Exchange Rate – Fixed and Flexible Exchange Rate: Meaning – Cases for and Against

**UNIT – V: Theory of Balance of Payments and International Institutions (15 hours)**

Balance of Payments - Meaning – Structure – Disequilibrium – Causes for Disequilibrium in the Balance of Payments –Correcting measures of Disequilibrium – Bretton Woods Twins - International Monetary Fund (I.M.F.): Objectives – SDR – Functions - World Bank (I.B.R.D.): Objectives - Functions – World Trade Organization (W.T.O): Objectives

### Books for Study

1. Salvatore Dominick, Schaum's Outline of International Economics, TATA Mcgraw-Hill Edition, New Delhi, 2022
2. Cherunilam Francis, International Economics, Tata McGraw Hill, New Delhi. 2022
3. Maria John Kennedy M, International Economics, Prentice Hall of India Publication, New Delhi, 2019

### Books for Reference

1. Dominick Salvatore, International Economics: Trade and Finance, John Wiley & Sons New Jersey, United States 2014
2. Mithani, D.M. International Economics, Himalaya Publishing House, Mumbai, 2015
3. Sodersten, B.O. & Geoffrey Reed, International Economics, McGraw Hill, Tokyo, 1994

### Teaching and learning methods:

- Lecture
- Reading the text
- Summaries each segment
- Class presentation

### Course Outcomes

SL.NO	COURSE OUTCOMES	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Comprehend the various theories and definitions of International trade	K2
CO2	Understand the gains from trade and terms of trade	K2
CO3	Assess the different different commercial policies and its effects	K2
CO4	Indicate the different theories associated with exchange rate and distinguish among different types of exchange rate	K3
CO5	Explain the structure of BOP and describe the international economic relations	K3

K<sub>1</sub>= Knowledge, K<sub>2</sub>= Understanding, K<sub>3</sub>= Application, K<sub>4</sub>= Analysis and K<sub>5</sub>= Synthesis

### Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of
CO1	3	2	2	3	2	3	3	-	-	2	3	-	2	25
CO2	3	2	2	3	2	3	3	-	-	2	3	-	2	25
CO3	3	3	2	3	2	3	3	-	-	2	3	-	2	25
CO4	3	2	2	3	2	3	3	-	-	2	3	-	2	25
CO5	3	2	2	3	2	3	3	-	-	2	3	-	2	25
Grand total of COs with PSOs and POs														125
Mean Value of COs with PSO and POs = ( 125/50)														2.5

Strong – 3, Medium – 2 & Low - 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.5
Observation	<b>COs of International Economics Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625514

DEPARTMENT OF ECONOMICS

Class	: B.A. Economics	Part	: CORE-10
Semester	: V	Hours	: 75
Subject Code	: 22UECD05	Credits	: 04

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HISTORY OF ECONOMIC THOUGHT

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives (CEO) :**

1. To instruct the origin of economic ideas
2. To describe the Mercantilism and Physiocracy
3. To educate Classical and modern economic thoughts
4. To impart the knowledge of Socialism and Marxism
5. To highlight the economic ideas of Indian economists

**Unit – I: Ancient Economic Thought (15 hours)**

Nature and Significance of Economic Thought – Hebrew Economic Thought – Greek Thought – Plato – Aristotle – The Islamic Thought – The Christian Economic - Thought Ancient Economic Thought in India: Kautilyas' Arthasastra – Economic Ideas of Thiruvalluvar

**Unit – II: Mercantilism and Physiocracy (15 hours)**

Factor that Gave Rise to Mercantilism – General Outline of Mercantilism – Role of State, Money, Interest, Trade – Representatives of Mercantilist – Thomas Mun - Decline of Mercantilism

Factor that Gave Rise to Physiocrats – Main ideas Physiocrats – Representatives of Physiocratic School - Quesnay

**Unit – III: Classical and Neo-Classical Economics (15 hours)**

Adam Smith – Thomas Robert Malthus – David Ricardo – J.B. Say - J.S. Mill – Meaning of Marginal Revolution – Main ideas of Marginal School – Main theories Knut Wicksell - Taussig

**Unit – IV: Keynesian and New Keynesian Economics (15 hours)**

Keynes: Background of Keynesian ideas – Keynesian Theory of Employment – Keynesian revolution and its impact

New Keynesian: Main ideas of Joseph Stiglitz – Gregory Mankiw – Paul Krugman

**Unit – V: Indian Economic Thinkers (15 hours)**

Gandhi – V. K. R. V. Rao - Dr. Ambedkar – Vakil and Bramanandha - Dravidian Economic Thoughts

**Book for study:**

1. Jhingan Ml, Girija M, Sasikala L, History Of Economic Thought, Vrinda Publications (P) Ltd, New Delhi, 2017
2. Charles Gide and Charles Rist, History of Economic Doctrines, University of California Press, California , USA, 2017
3. Lokanathan, V., History of Economic Thought, S. Chand, New Delhi, 2006

### Book for References:

1. Lionel Robbins , Steven G. Medema , Warren J. Samuels , A History of Economic Thought, Princeton University Press UK, 2000
2. William J. Barber, A History of Economic Thought, Wesleyan University Press, Middletown, USA , 2009
3. The Lord Roll of Ipsd Eric Roll of Ipsden K.C.M.G. C.B, The History of Economic Thought, Faber & Faber, 2002

### Teaching and learning methods

- Chalk and Talk
- Power point
- Quiz
- ICT Tools
- Group discussion

### Course Outcome

After completion of course History of Economic Thought the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Recall the origin of economic ideas	K1
CO <sub>2</sub>	Distinguish between Mercantilism and Physiocracy	K3
CO <sub>3</sub>	Recollect the views of Classical and Keynesian Economics	K3
CO <sub>4</sub>	Relate Socialism and Marxism	K2
CO <sub>5</sub>	Outline the Indian economic ideas	K3

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K5= Synthesis

### Mapping of CO with PO and PSO

Out	PSO	PSO	PSO	PSO	PSO	PO	Sum of COs with PSOs and POs							
CO1	3	3	1	2	2	3	3	1	1	2	1	-	1	23
CO2	3	3	2	2	2	3	3	1	1	2	2	-	1	25
CO3	3	3	3	2	2	3	3	1	1	2	2	-	1	26
CO4	3	3	2	3	2	3	3	3	3	2	1	-	1	29
CO5	3	3	3	3	2	3	3	2	2	1	2	-	1	28
Grand total of COs with PSOs and POs														131
Mean Value of COs with PSO and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{131}{60}\right)$														2.18

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.18
Observation	<b>COs of History of Economic Thought Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR - 625514

DEPARTMENT OF ECONOMICS

CLASS	: B.A. Economics	PART	: CORE-11
SEMESTER	: V	HOURS	: 75
SUBJECT CODE	: 22UECD15	CREDITS	: 04

MARKETING MANAGEMENT

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2019 - 2020)

**Course Educational Objectives (CEO) :**

- To expose the definitions and concepts of Marketing
- To Identify the different marketing strategy
- To Indicate the dimensions of consumer behavior
- To Comprehend the decision making process
- To Discuss the channels of marketing

**Unit I: Marketing (15 Hours)**

Definition – Nature of Marketing – Scope of Marketing – Macro and Micro Marketing – Concept of Modern Marketing – Features of Modern Marketing – Marketing Mix.

**Unit II: Marketing Functions (15 Hours)**

Marketing functions - Functions of Exchange – Selecting of Channels of Distribution – Creation of Demand – Determining the terms of sale – Customer's service – Functions of Physical Distribution – Objectives of Physical Distribution – Transportation, Storage and Warehousing - Facilitating Functions – Financing – Risk Bearing – Standardization and Grading – Marketing Information

**Unit III: Market Segmentation (15 Hours)**

Meaning of Market Segmentation – Targeting – Positioning - Marketing Segmentation Criteria – Benefits – Methods of Segmenting Markets – Consumer Behaviour – Buying Motives – Buying Decision Process

**Unit IV: Product Policy (15 hours)**

Meaning of product – Product Objectives and Strategies – Product Mix - Factors Influencing product mix – Package, Packing and Packaging – Product Management – Product Life Cycle – Product Planning – Product diversification – Pricing methods

Marketing Channel – Meaning - Structures – Types – Channel Functions – Special Distribution method – Channel Management – Channel option.

**UnitV: Marketing Research & Marketing Information System (MIS) (15 Hours)**

Marketing Research — Objectives – Elements of Marketing Research – Scope –Uses – Functions – Classifications – Process – Research Design – Sources of Data – Types of Sample Importance in Marketing Decisions – Elements of Marketing Information Systems – Emerging Trends in Marketing.

### **Books for Study:**

1. Nair Rajan & Sanjith Nair, Marketing, Sultan Chand & Sons New Delhi, 2021
2. Sherlekar, S.A., Principles of Marketing, Himalaya Publishing House, Mumbai, 2022
3. Philip Kotler, and Gary Armstrong, Principles of Marketing, Pearson Education Services Pvt Ltd, Bengaluru, Karnataka, 2020

### **Books for Reference:**

1. Sinha, J.L., Principles of Marketing and Salesmanship, S. Chand & Co. New Delhi, 1997
2. Balan, K.R., Marketing and Sales Management, Sterling Publishers, New Delhi, 1992
3. Majaro Siman, Essence of Marketing, PHI, New Delhi 1993

### **Teaching and learning methods**

- Chalk and Talk
- Power point
- Group Discussion
- Field visit

### **Course Outcome**

After completion of course Marketing Management the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Familiarise with market structures	K <sub>1</sub>
CO <sub>2</sub>	Identify the factors involved in price determination	K <sub>2</sub>
CO <sub>3</sub>	Predict the risk involved in marketing	K <sub>3</sub>
CO <sub>4</sub>	Understand the Segregation of market	K <sub>3</sub>
CO <sub>5</sub>	Forecast the future of marketing	K <sub>3</sub>

K1= Knowledge, K2= Understanding, K3 = Application, and K4= Analysis

### **Mapping of CO with PO and PSO**

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Level	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	2	3	2	3	3		3	2	2	2	1	-	2	25
CO2	3	3	2	2	3		3	1	1	-	2	-	2	22
CO3	2	3	3	3	3		3	2	2	-	2	-	2	25
CO4	3	2	1	2	2		3	2	1	-	2	-	-	18
CO5	2	3	3	2	3		3	2	2	3	3	-	-	26
Grand total of COs with PSOs and POs														116
Mean Value of COs with PSO and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{116}{55}\right)$														2.11

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.11
Observation	<b>COs of Marketing Management Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625 514**

**DEPARTMENT OF ECONOMICS**

<b>Class</b>	<b>: B.A. Economics</b>	<b>Part</b>	<b>: IV</b>
<b>Semester</b>	<b>: IV &amp; V</b>	<b>Duration</b>	<b>: 25 days</b>
<b>Subject Code</b>	<b>: 22UINT15</b>	<b>Credits</b>	<b>: 01</b>

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**Internship**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022-23)**

**Course Educational Objectives**

- To promote experiential learning
- To encourage participative learning
- To inculcate analytical skill

**Modality of the Course**

1. The mentor of the student will provide guidance.
2. In Consultation with the mentor, the student will finalize the organization and period of the programme (IV semester vacation or V semester vacation or both.)
3. The work done report should be updated with the mentor periodically.
4. The final report of the internship should be submitted to the Head of the Department within 10 days of the reopening of the college in the subsequent semester.
5. Along with the report the student has to submit course completed certificate from competent authority.
6. Geo tagged photo has to be attached along with the report if a student underwent the course in an informal organization.

**Evaluation**

<b>Internal</b>	<b>Summative (Viva-Voce)</b>		<b>Total</b>
	<b>Internal</b>	<b>External</b>	
50	25	25	100

ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625 514

DEPARTMENT OF ECONOMICS

Class	: III Year (B.A., B.Sc.,)	Part	: Self-Learning
Semester	: V	Hours	:
Subject Code	: 22UECSL5	Credits	: 03

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MARXIAN ECONOMICS

(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2022-23)

**Course Specific Objectives (CSO):**

1. To know the Marxian materialistic interpretation of History
2. To familiarize with the Marxian theory of surplus value.
3. To highlight Marxian theory of disintegration of capitalism
4. To summarize the concept of Socialism
5. To indicate Socialism in USSR and China

**Unit – I: Marxian Materialistic Interpretation of History**

Introduction – Importance of the Study of Marxian Economics – Assessment of Marxism  
Background – Other Interpretation of History – Marxian Interpretation of History – Critique  
of Marxian Interpretation of History

**Unit – II: Marxian Theory of Surplus Value**

Emergence of Surplus Value – Origin of Surplus Value – Assumptions and Numerical  
Exposition – Definitions – Inevitability of Surplus Value – Importance of the Theory –  
Criticism – Marxian Theory of Falling Rate of Profit – Critique of the Falling Rate of Profit.

**Unit – III: Marxian Theory of Disintegration of Capitalism**

Different Interpretations of Capitalism – Different Interpretation of Capitalist Breakdown –  
Marx a False Prophet?

**Unit – IV: Socialism**

Introduction – Definitions – Essential Characteristics – Advantages – Shortcomings  
Communism – Characteristics – Communism Vs Socialism – Similarities – Differences –  
Critical appraisal of Communism

**Unit – V: Socialism In U.S.S.R and China**

Experience of Socialism USSR - Chinese Economic Experiment: Market Socialism – Lesson for  
India

**Books for Study:**

1. Robert Albritton, Economics Transformed: discovering the brilliance of Marx, Pluto  
Press, London, UK, 2007
2. Desai Maghnad, Marxian Economics, Blackwell, New York, 2011
3. Joan Robinson, An Essay on Marxian Economics, The Mac millian Press, London, 1982

### Books for Reference

1. Ben Fine, Alfredo Saad-Filho, Marco Boffo, The Elgar Companion to Marxist Economics, Edward Elgar Publishing Ltd, Glos, UK, 2012.
2. Eugene Kamenka, The Portable Karl Marx Penguin Books, Publishing company, London, UK, 1983
3. Ernest Mandel An Introduction to Marxist Economic Theory, Pathfinder Books Ltd, Auckland, 1973

### Teaching and learning methods:

- Lecture
- Reading the text
- Summaries each segment
- Class presentation
- Brainstorm

### Course Outcomes

After completion of course Marxian Economics the student will be able to

SL.NO	COURSE OUTCOMES	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Comprehend the Marxian interpretation of History	K2
CO2	Understand the Marxian theory of surplus value	K2
CO3	Elucidate the Marxian theory of disintegration of capitalism	K2
CO4	Examine the significance of Socialism	K3
CO5	Explain Socialism in USSR and China	K3

K<sub>1</sub>= Knowledge, K<sub>2</sub>= Understanding, K<sub>3</sub>= Application, K<sub>4</sub>= Analysis and K<sub>5</sub>= Synthesis

### Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	1	-	-	2	3	3	3	3	2	-	-	-	20
CO2	3	3	-	-	2	3	3	3	3	2	-	-	-	22
CO3	3	1	-	-	2	3	3	3	3	2	-	-	-	20
CO4	3	3	-	2	2	3	3	3	3	2	-	-	-	24
CO5	3	3	-	3	2	3	3	3	3	2	-	-	-	25
Grand total of COs with PSOs and POs														111
Mean Value of COs with PSO and POs =												$\left(\frac{111}{42}\right)$	2.64	

$$\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} =$$

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.64
Observation	<b>COs of Marxian Economics Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR - 625514

DEPARTMENT OF ECONOMICS

Class	: B.A. Economics	Part	: CORE-12
Semester	: VI	Hours	: 75
Subject Code	: 22UECD26	Credits	: 05

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INDIAN ECONOMY

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives (CEO) :**

1. To enlighten the nature of the Indian economy
2. To impart the knowledge of sectoral composition of an Indian economy
3. To spotlight the monetary and fiscal scenario of an economy
4. To highlight the of an economy the in-and-out of India's balance of payment
5. To understand Problems of Indian Economy

**Unit – I: Features and Issues of Indian Economy (15 hours)**

Characteristics of the Indian Economy - Is India, a developed economy or developing economy? Indian economy at Independence – The policy framework: statist policy, transition to market-oriented policy - Two phases of growth (1950-1980 and 1980 onwards), - Structural change in Indian economy

**Unit – II: Sectoral Growth (15 hours)**

Agricultural development - Land reforms – Success and weakness - The Green Revolution – Impact - State policy for agricultural development – Role of Agriculture  
Industrial development – Appraisal of India's Industrial policy before 1991 – Role of public sector – Industrial policy after 1991 - Policy for MSMEs – Performance of Large Scale Industry and MSMEs  
Growth and contribution of service sector in Indian economy – Is Service Sector led growth Sustainable?

**Unit – III: Monetary and Fiscal Issues (15 hours)**

Monetary Policy Committee – Function – RBI's policy rates and reserve rates–Cashless Economy – Financial Inclusion – Fiscal Policy: Revenue and Expenditure Trend – FRBM Act 2003 – Fiscal Consolidation – Current Budget – Role of Monetary and Fiscal Policy for Economic Growth.

**Unit – IV: Balance of Payments: Problems and Policies (15 hours)**

India's Balance of Payment – Management of Balance of Payments – Trade policy (2015-20) – Foreign capital: Components – Indian government policy towards foreign capital - A Note on Foreign Exchange Reserves

**Unit – V: Indian Economic Problems (15 hours)**

Unemployment in India – Measures of employment and unemployment – Types of unemployment – Unemployment after liberalization – Poverty – Concept of Poverty Line – Poverty Estimates in India – Multidimensional Poverty Index – Recent Poverty Alleviation and Employment Generation Programmes – Inflation – Inflation Measures in India – Controlling Measures.

### **Books for Study:**

1. Mishra & Puri, Indian Economy, Himalaya Publishing House, Mumbai, 2016
2. Uma Kapila, Indian Economy Since Independence, Academic Foundation, Haryana 2019
3. Gaurav Datt and Ashwani Mahajan, Datt & Sundharam's Indian Economy, S. Chand & Company, New Delhi, 2017

### **Books for Reference :**

1. Garg, V.K., Indian Economic Problems, Sultan Chand & Sons, New Delhi, 2016
2. Dhingra I.C, Indian Economy, Sultan Chand & Sons, New Delhi, 2015
3. Agrawal, A.N. , Agarwal, M.K. Indian Economy: Problems of Development and Planning, New Age International (P) Ltd., Publishers, New Delhi, 2017

### **Teaching and learning methods**

- Lecture
- Power point
- Brainstorm
- Quiz
- Google maps
- Videos

### **Course Outcome**

After completion of course Indian economy the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Describe the nature of Indian economy	K4
CO <sub>2</sub>	Examine the sectoral performances of an economy	K4
CO <sub>3</sub>	Assess the monetary issues of an economy	K5
CO <sub>4</sub>	Appraise the fiscal performance of Indian economy	K5
CO <sub>5</sub>	Explore the problems of balance of payment	K3

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K5= Synthesis

### **Mapping of CO with PO and PSO**

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum Of COs with PSOs and POs
CO1	3	3	2	2	2	3	3	-	2	2	1	-	1	24
CO2	3	3	3	3	2	3	3	-	1	2	1	-	1	25
CO3	3	3	2	2	2	3	3	-	2	2	1	-	1	24
CO4	3	3	3	3	2	3	3	-	1	2	2	-	1	26
CO5	3	3	3	3	2	3	3	-	1	2	2	-	1	26
Grand total of COs with PSOs and POs														125
Mean Value of COs with PSO and POs = $\frac{\text{Grand total of COs with PSOs and POs (125)}}{\text{Number of COs relating with PSOs and POs (55)}}$														2.27

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.27
Observation	<b>COs of Indian Economy Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514

DEPARTMENT OF ECONOMICS

Class	: B.A. Economics	Part	: CORE-13
Semester	: VI	Hours	: 75
Subject Code	: 22UECD36	Credits	: 04

**MATHEMATICAL ECONOMICS**

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives (CEO) :**

1. To introduce the role of differential calculus in economics
2. To point out the concept of integration and its application in Economics
3. To teach the applications of differentiations in economic theories
4. To instruct the production function by applying mathematical tools
5. To introduce the concept of integration and its application in Economics

**Unit – I: The Theory of Consumer Behaviour (15 hours)**

Marginal Utility – Indifference Curve – Marginal Rate of Substitution – Maximisation of Utility – Elasticity of Demand

**Unit – II: Production Function (15 hours)**

Production Function – Relationship between Average Productivity and Marginal Productivity – Equal Product Curves (Isoquants) – Shape of Isoquants – Isoquants and Ridge Lines – Constrained Profit Maximisation – Homogeneous Function – Definition and Properties – Properties of Linear Homogeneous Functions – Cobb Douglas Production Function – Properties – EULER's Theorem

**Unit – III: Theory of Firm (15 hours)**

Marginal Revenue – Marginal Cost – Relationship between Average Revenue and Marginal Revenue - Relationship between Marginal Cost and Average Cost – Profit Maximization under Perfect Competition and Monopoly – Market Equilibrium – Equilibrium of two separate Markets

**Unit – IV: Integration and its Application (15 hours)**

Definition of Integral Calculus – Basic Rules of Integration - Integration by Parts – Definite Integrals - Area between two Curves – Cost and Revenue Functions – Consumer's Surplus – Producers Surplus

**Unit – V: Input Output Analysis and Game Theory (15 hours)**

Input Output Analysis: Meaning – Basic concepts – Assumptions – Importance – Applications of Input Output analysis in Two sector model - Hawkins-Simon Condition  
Game Theory: Meaning – Basic concepts – Pure strategy game with saddle point – Mixed strategy game

**Books for Study:**

1. Metha, B.C. & Madnani, Mathematics for Economics, S.Chand, New Delhi, 2020
2. Edward T Dowling, Schaum's Outline series Introduction to Mathematical Economics, , McGraw-Hill, New Delhi, 2021

3. D. Bose, An Introduction to Mathematical Economics, Himalaya Publishing House, Mumbai, 2021

**Books for Reference:**

1. Chiang C Alpha and Wainwright Kevin, McGraw Hill Education; New Delhi 2017
2. Dowling T Edward, Schaum's Outline of Introduction to Mathematical Economics, McGraw-Hill Education, New Delhi, 2011
3. Allen, R.G.D. Mathematics for Economist, Chadha & Agarwal, New Delhi, 2012

**Teaching and learning methods**

- Chalk and Talk
- Power point
- Brainstorm
- Quiz
- ICT Tools
- Follow up exercises

**Course Outcome**

After completion of course Economics of Development the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Apply the concept of partial and total derivatives in consumer behavior	K4
CO <sub>2</sub>	Derive the production function	K4
CO <sub>3</sub>	Find the price and output of a firm by applying mathematical tools	K4
CO <sub>4</sub>	Calculate the producer's and consumer's surplus by using integral calculus	K4
CO <sub>5</sub>	Estimate the impacts of interdependent relationships between two sectors within an economy.	K4

K1=Remembering, K2= Understanding, K3 = Application, K4= Analysis and K<sub>5</sub>= Synthesis

**Mapping of CO with PO and PSO**

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	3	3	2	3	3	-	-	1	3	-	-	24
CO2	3	3	3	3	2	3	3	-	-	1	3	-	-	24
CO3	3	3	2	3	1	3	3	-	-	1	3	-	-	22

CO4	3	3	2	3	1	3	3	-	-	1	3	-	-	22
CO5	3	3	2	3	1	3	3	-	-	1	3	-	-	22
Grand total of COs with PSOs and POs													114	
Mean Value of COs with PSO and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}}$ ( $=\frac{114}{45}$ )													2.53	

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.53
Observation	<b>COs of Mathematical Economics Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625 514

DEPARTMENT OF ECONOMICS

Class	: B.A. Economics	Part	: CORE-14
Semester	: V	Hours	: 75
Subject Code	: 22UECD46	Credits	: 04

CORE: DEVELOPMENT ECONOMICS

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives (CEO) :**

1. To introduce the factors associated with economic development
2. To understand the role and importance of Capital formation, Agriculture and Industry
3. To discuss the self-regulating system for economic development
4. To teach the transition process of an economy from the state of backwardness
5. To focus on conditions for economic development

**Unit I: Economic Development and Human Development Indices (15 hours)**

Economic Development: Meaning – Economic growth vs Economic Development – Determinants of Economic Development – Obstacles to Economic Development – Human Development Index: Meaning – Components – Construction of HDI – Multi Dimension Poverty Index – Gender Inequality Index – Women’s Education and Development- Sustainable Development Goals

**Unit II: Domestic Measures for Economic Development (15 hours)**

Meaning of Capital Formation - Importance of Capital Formation - Reasons for Low Rate of Capital Formation - Sources of Capital Formation  
Foreign Capital: Meaning – Forms – Importance of Foreign Capital – Foreign capital vs Aid – Importance of Foreign capital in Developing Country

**Unit – III: Classical Economic Theories (15 hours)**

Adam Smith – David Ricardo – Malthus -Marx’s Theory of Economic Development – Rostow’s Stages of Growth

**Unit IV: Growth Theories (15 hours)**

Fei-Ranis model of Economic Growth – Lebeinstein’s Critical Minimum Effort Thesis  
– Big Push Theory – Doctrine of Balanced Growth and Unbalanced Growth – Paul Krugman’s New Economic Geography theory

**Unit V: Growth Models (15 hours)**

Meaning and Uses of Growth Models – J.E. Meads Model – Mahalanobis Model: Four Sector Model -Harrod – Domar Model – Joan Robinson’s Model of Capital Accumulation

**Books for Study**

1. Misra & Puri, Economics of Development and Planning - Theory And Practice, Himalaya Publishing House, New Delhi, 2016
2. Jhingan, M.L., Economics of Development and Planning, Vrinda Publications P LT Pvt. Ltd., New Delhi, 2016

3. Taneja M.L. & Myer R.M., Economics of Development and Planning Vishal Publishing Co, Jalandhar, Punjab, 2016

**Books for Reference**

1. Thirlwall A.P., Economics of Development – Theory and Evidence, Palgrave Macmillan, 2016.
2. Kundan Lal and Agarwal, A.N., Economics of Development and Planning, Vikas Publishing House Pvt. Ltd., New Delhi, 2015
3. Mamatha Patnakar, Economic Planning Principles and Practice, Sultan Chand & Sons, New Delhi, 2014

**Teaching and learning methods**

- Lecture
- Tutorials
- Power point
- Group discussion
- Quiz
- Assignment

**Course Outcome**

After completion of course Economics of Development the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom’s Taxonomy)
CO <sub>1</sub>	Relate the Economic growth and development	K3
CO <sub>2</sub>	Highlight the need for capital formation	K2
CO <sub>3</sub>	Describe the self-regulating system of an economy	K3
CO <sub>4</sub>	Outline the conditions for economic transition	K3
CO <sub>5</sub>	Illustrate the functional relationship between national income and its determinants	K3

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K5= Synthesis

**Mapping of CO with PO and PSO**

Out	PSO	PSO	PSO	PSO	PSO	PO	Sum of COs with PSOs & POs							
CO1	3	3	2	2	2	3	3	2	-	1	2	2	2	27
CO2	3	3	2	2	2	3	3	2	-	1	2	2	2	27
CO3	2	2	3	3	3	3	3	1	3	2	3	1	2	31
CO4	2	2	3	3	3	3	3	1	3	2	3	1	2	31
CO5	3	3	3	3	2	3	3	-	1	2	3	1	1	28
Grand total of COs with PSOs and POs														144
Mean Value of COs with PSO and POs = $\frac{\text{Grand total of COs with PSOs and POs (144)}}{\text{Number of COs relating with PSOs and POs (5)}} = 2.32$														2.32

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.32
Observation	<b>COs of Economics of Development Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514

DEPARTMENT OF ECONOMICS

Class	: B.A. Economics	Part	: CORE-15
Semester	: VI	Hours	: 75
Subject Code	: 22UECD56	Credits	: 04

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ENVIRONMENTAL ECONOMICS

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives (CEO) :**

1. To introduce basic concepts of Environmental Economics
2. To deal the various types of pollution
3. To relate the environment and economy
4. To spotlight the conservation of resources
5. To focus on the Energy Economics

**Unit - I Basic Concepts of Environmental Economics (15 hours)**

Environmental Economics – Meaning – Subject matter – Nature and Scope – Significance of Environmental Economics – Economic Development and Environment – Concept of Sustainable development – Economic Accounting and the Measurement – Green GDP

**Unit –II Environmental Problems (15 hours)**

Nature and sources of pollution – Air pollution, Water pollution, Soil pollution, Marine pollution – Noise pollution – Effects of Deforestation – Effects of Global warming – Effects of Climate Change - Urbanisation and its impact on Environment – Population and Environmental Quality.

**Unit – III Market Failure (15 hours)**

Market failure – Common property rights – Externalities and Market Efficiency – Measures to control externalities – Pareto optimality provision on public goods – Theory of Second Best – Environmental Kuznets Hypothesis.

**Unit - IV Conservation of Resources (15 hours)**

Conservation and Preservation – Classification of Resources – Renewable and Non Renewable Resources – Human Impact on Resources – Method of Conservation – Material Substitution – Product life Extension – Recycling – Optimum Recycling – Waste Reduction – Needs for conserving forest.

**Unit - V Energy Economics (15 hours)**

Meaning of energy – Sources of energy – Classification – Alternative source of Energy – Need for conserving energy and maintaining environmental quality – Energy problems in developing countries – Remedies to solve the Energy Problem

**Books for Study**

1. S. Sankaran, Environmental Economics, Margham Publications, Chennai, 2018
2. K.V. Pavithran, A Textbook of Environmental Economics, New Age International (P) Ltd, New Delhi, 2019
3. T. Eugene , Environmental Economics, Vrinda Publication, New Delhi 2004

### Book for References

1. Seneeca J.J. and H.K. Taussig, Environmental Economics, Pearson College Subsequent edition, 1983
2. Ben White, Jason Shogren, and Nick Hanley, Environmental Economics: In Theory and Practice, Macmillan Education Limited, Indian Edition, New Delhi – 2010
3. Nick Hanley, Jason Shogren, Ben White, Introduction to Environmental Economics, OUP Oxford, London, 2013

### Teaching and learning methods

- Lecture and tutorial
- Newspaper cutting
- Power point
- Brainstorm
- Quiz
- ICT Tools

### Course Outcome

After completion of course Environmental economics the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Comprehend the basic concepts of environmental economics	K2
CO2	Identify different types of pollution	K2
CO3	Relate the environment and economics	K3
CO4	Identify the Environment conservation techniques	K4
CO5	Distinguish different sources of energy	K4

K1= Knowledge, K2= Understanding, K3= Application, K4= Analysis and K5= Synthesis

### Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs with POs
CO1	3	3	3	3	2	3	3	3	2	2	1	-	-	28
CO2	3	3	3	3	1	3	3	2	2	1	2	-	-	26
CO3	3	3	3	3	1	3	3	2	2	1	2	-	-	26
CO4	3	3	3	3	1	3	3	2	2	2	1	-	-	26
CO5	3	3	3	2	2	3	3	1	2	1	1	-	-	24
Grand total of COs with PSOs and POs														130
Mean Value of COs with PSO and POs =														$(\frac{130}{55})$ 2.36

$$\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} =$$

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.36
Observation	<b>COs of Environmental Economics Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514

DEPARTMENT OF ECONOMICS

Class	: B.A. Economics	Part	: CORE-16
Semester	: VI	Hours	: 75
Subject Code	: 22UECD66	Credits	: 04

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DEMOGRAPHY

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)

**Course Educational Objectives (CEO) :**

1. To familiarise with the concept of demography
2. To disseminate the fertility and mortality concepts
3. To introduce the concept of migration
4. To outline the sources of demographic data
5. To acquaint about the theories of population

**Unit I: Demography (15 Hours)**

Population: Meaning - Demography: Meaning – Definition – Scope of Demography – Importance of Demography – Demography vs Development – National Population Policy 1976 and 2000: Objectives and Targets

**Unit – II Fertility and Mortality (15 Hours)**

Fertility: Meaning – Fecundity – Measures of Fertility – Factors Affecting Fertility  
Mortality: Meaning – Measures of Mortality – Factors Affecting Mortality – Causes for Decline in Mortality Rates in Developing Countries.

**Unit – III Migration (15 Hours)**

Migration: Meaning - Types of Migration – Sources of Migration – Methods of measuring internal migration – Causes of Migration – Effects of Migration – Pattern of Migration in India

**Unit IV: Theories of Population and Migration (15 Hours)**

Theory of Population: Malthusian Theory of Population – Optimum Theory of Population - Theory of Demographic Transitions  
Theories of Migration: Duncan’s Theory – Lewis Model of Rural Urban Migration – Harris Todaro Model of Rural Urban Migration

**Unit V: Sources of Demographic Data (15 Hours)**

Census: Meaning - Methods of Census – Salient Features – Uses – Problems – Characteristics of 2011 Census - Civil Registration method: Vital Registrations (Statistics) – Uses of Vital Statistics – Life table: Meaning – Types - Assumptions of Life table – Age Sex Composition – Population Pyramid: Meaning – Types of Population Pyramid - Sample Surveys

**Books for Study**

1. M.L. Jhingan, B.K. Bhatt & J. N. Desai, Demography , Vrinda Publications (P) Ltd, New Delhi.
2. Bhushan Shashi, Demography, VK Global Publications Pvt Ltd, New Delhi, 2020
3. Sharma K Rajendra, Demography and Population Problems, Atlantic Publishers, New Delhi,

### Books for Reference

1. Mishra, B.D., Introduction to the Study of Population, South Asian Publishers, New Delhi
2. Agarwala, S.N., India's Population problem, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2018
3. Bhenda AA, Asha A. Bhende and Tara Kanitkar , Principles of Population Studies, H P House, Mumbai

### Teaching and learning methods

- Lectures
- Reading the text
- Summarizing
- Power point
- Class Presentation

### Course Outcome

After completion of course Demography the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Classify the demographic profile	K <sub>1</sub>
CO <sub>2</sub>	Recognise the determinants of demography	K <sub>2</sub>
CO <sub>3</sub>	Grasp different dimensions of Migration	K <sub>3</sub>
CO <sub>4</sub>	Analyze the demographic transition and pattern of Migration	K <sub>3</sub>
CO <sub>5</sub>	Access different sources of Demographic data	K <sub>4</sub>

K<sub>1</sub>= Knowledge, K<sub>2</sub>= Understanding, K<sub>3</sub>= Application, K<sub>4</sub>= Analysis and K<sub>5</sub>= Synthesis

### Mapping of CO with PO and PSO

Out	PSO	PSO	PSO	PSO	PSO	PO	Sum of COs with PSOs and POs							
CO1	3	3	3	2	1	3	3	-	1	2	1	-	-	22
CO2	3	3	3	2	1	3	3	-	1	2	1	-	-	22
CO3	3	3	3	3	2	3	3	-	2	1	1	-	-	24
CO4	3	3	3	3	2	3	3	-	2	2	-	-	-	24
CO5	3	3	2	3	3	3	3	3	2	2	2	-	-	29
Grand total of COs with PSOs and POs														121
Mean Value of COs with PSO and POs = $\frac{\text{Grand total of COs with PSOs and POs (121)}}{\text{Number of COs relating with PSOs and POs (50)}}$														

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.42
Observation	COs of Demography related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625 514**  
**DEPARTMENT OF ECONOMICS**

<b>Class</b>	<b>: III Year (B.A., B.Sc.,)</b>	<b>Part</b>	<b>: Self-Learning</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>:</b>
<b>Subject Code</b>	<b>: 22UECSL6</b>	<b>Credits</b>	<b>: 03</b>

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**ECONOMIC REFORMS IN INDIA**

**(Outcome based syllabus under CBCS structure for the students admitted from the academic year 2019- 20)**

**Course Specific Objectives (CSO):**

1. To familiarize with the Contemporary Economic Reforms.
2. To recall the Macro Economic Scenario.
3. To summarise the concept of Privatization
4. To know about the Liberalization
5. To highlight Globalisation

**Units – I: Contemporary Economic Reforms**

Contemporary Economic Reforms - Origin of Economic Crisis - Economic Reforms - Macro Economic Stabilization - Structural Reform

**Unit –ii: Macro Economic Scenario**

Macroeconomic Scenario - Economic Growth - Industrial Growth - Agricultural Growth - Saving and Investment Growth - Prices and Inflation - Fiscal Imbalance - Monetary and Capital Market Developments - Foreign Direct Investment

**Unit – iii: Privatization**

Meaning and Progress of Privatization – Routes of Privatization: Supporters Angle. Disinvestment Programme in India. Privatization: A critique.

**Unit – iv: Liberalization**

Economic Liberalization and its Implications for Employment in India - Trends in Strikes Lock Outs and Closures - Labour Reforms

**Unit – V: Globalization**

Meaning - Components - Causes - Impact on Indian Economy

**Book for Study**

1. Anne O. Krueger, Economic Policy Reforms and the Indian Economy, Oxford University Press, London, UK, 2002.
2. Nicholas C. Hope, Economic Reform in India: Challenges, Prospects, and Lessons, Cambridge University Press, London, UK, 2013.
3. Jagdish Bhagwati and Arvind Panagariya, Reforms and Economic Transformation in India Studies in Indian Economic Policies, Sterling Publishers Pvt. Ltd, New Delhi, 2004.

**Books for Reference**

1. Mishra & Puri, Indian Economy, Himalaya Publishing House, Mumbai, 2016.

2. Gaurav Datt and Ashwani Mahajan, Datt & Sundharam's Indian Economy, S. Chand & Company, New Delhi, 2017.
3. Agrawal, A.N., Agarwal, M.K. Indian Economy : Problems of Development and Planning, New Age International (P) Ltd., Publishers, New Delhi, 2017.

**Teaching and learning methods:**

- Lecture
- Reading the text
- PowerPoint presentation
- Quiz
- Journals and Magazines

**Course Outcomes**

After completion of course Economic Reforms in India the student will be able to

SL.NO	COURSE OUTCOMES	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Comprehend the contemporary economic Reforms	K2
CO2	Understand the macroeconomic Scenario	K2
CO3	Indicate the concept of Privatization	K2
CO4	Assess the implications of liberalization	K3
CO5	Explain the concept of globalization	K3

K<sub>1</sub>= Knowledge, K<sub>2</sub>= Understanding, K<sub>3</sub>= Application, K<sub>4</sub>= Analysis and K<sub>5</sub>= Synthesis

**Mapping of CO with PO and PSO**

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	-	3	2	3	3	-	2	1	-	-	-	20
CO2	3	1	-	3	1	3	3	-	2	1	-	-	-	17
CO3	3	3	-	2	1	3	3	-	3	1	-	-	-	19
CO4	3	3	-	2	1	3	3	-	3	1	-	-	-	19
CO5	3	3	-	2	1	3	3	-	3	1	-	-	-	19
Grand total of COs with PSOs and POs														94
Mean Value of COs with PSO and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{94}{40}\right)$														

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.35
Observation	COs of Economic Reforms in India strongly related with PSOs and POs		

**DEPARTMENT OF PHILOSOPHY**



## PSOs - Programme Specific Outcome

***On completion of B.A. Philosophy programme, the students will be able to***

- PSO1:** Exhibit an in-depth understanding of major traditions and contemporary ideas in the field of philosophy, religion, and psychology.
- PSO2:** Compare diverse philosophical perspectives and competing viewpoints to assimilate their specific wisdom in relation to self, others, and the world, with adequate solutions.
- PSO3:** Employ logical, analytical, critical, innovative, and scientific methodologies and skills.
- PSO4:** Formulate a constructive philosophy of life and a value-based inclusive world-view for egalitarian society and sustainable nature.
- PSO5:** Demonstrate enhanced skills of reading, writing, and speaking effectively on philosophy and other disciplines methodologically.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**CBCS STRUCTURE for B.A. PHILOSOPHY (2022 – 2023 onwards)**

Part	Courses	Hrs	Cr
<b>I Semester</b>			
I	Tamil/ Hindi/French	06	4
II	English	05	4
III	Core – 1: Introduction to Philosophy and Traditional Logic	06	5
	Core – 2: Ancient Indian Thought	06	5
IV	Allied – 1: General Psychology	05	4
	FC: Personality Development	01	1
	Bridge Course	-	1
	Language Skills: Sanskrit	01	
V	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
		<b>30</b>	<b>24</b>
<b>II Semester</b>			
I	Tamil /Hindi /French	06	4
II	English	05	4
III	Core – 3: Western Philosophy: Ancient and Medieval	06	5
	Core – 4: Indian Philosophical Systems	06	4
IV	Allied – 2: Ethics and its Social Dimensions	05	4
	FC: Social Responsibility for Global Citizenship	01	1
	Language Skills: Sanskrit	01	1
V	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
		<b>30</b>	<b>24</b>
<b>III Semester</b>			
I	Tamil /Hindi /French	06	4
II	English	06	4
III	Core – 5: Western Philosophy: Modern	05	4
	Allied – 3: Social and Political Philosophy	05	4
	Core Elective – 1a: Research Methodology	04	3
	Core Elective – 1b: Introduction to Islamic Philosophy		
IV	Basic Tamil/Advanced Tamil/Non-major Elective – 1	03	2
	Professional Ethics (Science)		
	FC: Environmental Studies	01	01
V	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
	ARISE	-	-
		<b>30</b>	<b>22</b>

<b>IV Semester</b>			
I	Tamil /Hindi /French	06	4
II	English	06	4
III	Core – 6: Western Philosophy: Contemporary	05	5
	Allied – 4: Philosophical Foundations of Human Rights	05	4
	Core Elective – 2a: Eco-Philosophy Core Elective – 2b: Philosophy of Knowledge: Classical Approach	04	3
IV	Basic Tamil/Advanced Tamil/Non-Major Elective – 2: Philosophy for Competitive Examinations (Arts)	03	2
	FC: Faith and Reason	01	1
V	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
	ARISE	-	1
		<b>30</b>	<b>25</b>
<b>V Semester</b>			
III	Core – 7:-Philosophy of Knowledge: Contemporary Approach	05	5
	Core – 8: General Metaphysics	05	4
	Core – 9: Philosophy of God and Religion	05	4
	Core – 10: Moral Philosophy	05	4
	Core – 11: Postmodern Philosophy	05	4
IV	Skill Based Elective – 1a: Applied Psychology	03	2
	Skill Based Elective – 1b: Internet and Office Automation		
	Soft Skills	02	
	Project	0	1
		<b>30</b>	<b>24</b>
<b>VI Semester</b>			
III	Core – 12: Modern and Contemporary Indian Thought	05	5
	Core – 13: Philosophical Anthropology	05	4
	Core – 14: Metaphysics: Contemporary Issues	05	4
	Core – 15: Philosophy of Science	05	4
	Core – 16: Comprehensive Understanding of Philosophy	05	4
IV	Skill Based Elective – 2a: Applied Aesthetics	03	2
	Skill Based Elective – 2b: Web Design		
	Soft Skills	02	2
		<b>30</b>	<b>25</b>

Semester	I	II	III	IV	V	VI	Total
Credits	24	24	22	25	24	25	144

### Self-Learning Courses – Additional Credits

Semester	Course Code	Name of the Course	Credits
III	22UPHSL3	Liturgy and Introduction to Christian Spirituality	3
IV	22UPHSL4	Introduction to Church History and Second Vatican Council	3
V	22UPHSL5	Natural Theology: Classical Perspectives	3
VI	22UPHSL6	Natural Theology: Contemporary Perspectives	3

**\* represents practical outside the class hour**

**SLC : MOOC/SWAYAM (2 credits for each course, maximum of 2 courses)**

**ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514**  
**DEPARTMENT OF PHILOSOPHY**

<b>Class</b>	<b>: B.A. Philosophy</b>	<b>Part</b>	<b>: Core - 7</b>
<b>Semester</b>	<b>: V</b>	<b>Hours</b>	<b>: 75</b>
<b>Course Code</b>	<b>: 22UPHC75</b>	<b>Credits</b>	<b>: 05</b>

**PHILOSOPHY OF KNOWLEDGE: CONTEMPORARY APPROACH**

(For those who joined in June 2022 onwards)

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**Course Objectives:**

The course introduces the students to the contemporary world of knowledge to comprehend and evaluate its varied theories. It helps them also to explain applied epistemology and the contemporary approaches to truth.

**COURSE CONTENT:**

**Unit 1: Foundation and Coherence Theories** **15 hours**

(A) Basic beliefs – Epistemic assent – Reasoning and memory – Reconsideration of basic beliefs; (B) Taxonomy of Coherence theories – Holistic Positive Coherence theories – Negative Coherence theories – Nondoxastic theories and Direct Realism

**Unit 2: Externalism and Epistemic Norms** **15 hours**

(A) Varieties of Probability – Probabilism – Reliabilism – Other versions of Externalism; (B) Epistemic Norms – How do Epistemic Norms regulate? – Refutation of Externalism

**Unit 3: Epistemological Theories** **15 hours**

(A) Gadamer: Understanding – Truth and Universality – Realism and Relativism; (B) Merleau-Ponty: Embodied Perception – Truth, Objectification, and Science – Realism; (C) Rorty: Behaviorism – Charge of Relativism – Realism, Science, and Progress

**Unit 4: Theories of Truth** **15 hours**

Verificationist Theory – Constructivist Theory – Redundancy Theory – Performative Theory – Tarski's Semantic Theory – Disquotational Theory – Prosentential Theory – Aletheiatic Theory

**Unit 5: Applied Epistemology** **15 hours**

Virtue Epistemology – Naturalistic Epistemology – Bayesian Epistemology – Ecological Epistemology – Social Epistemology – Religious Epistemology – Moral Epistemology – Feminist Epistemology

**Books for Study:**

1. O'Brien, D. (2017). *An introduction to the theory of knowledge* (2<sup>nd</sup> ed.). Polity.
2. Pollock, J. L., & Cruz, J. (1999). *Contemporary theories of knowledge* (2<sup>nd</sup> ed.). Rowman & Littlefield Publishers.

**Website Links for Study:**

1. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=oYPhnOmK5lhY4GGCoKqF5Q=>

2. <https://iep.utm.edu/>
3. <https://www.newworldencyclopedia.org/>

**Books for References:**

1. Audi, R. (2011). *Epistemology: A contemporary introduction to the theory of knowledge*. Routledge.
2. Feldman, R. (2003). *Epistemology*. Prentice Hall.
3. Pritchard, D. (2014). *What is this thing called knowledge?* (3<sup>rd</sup> ed.). Routledge.

**Teaching and Learning Methods:**

- Lectures and dialogues, Essays (Persuasive / Expository), Reflective Group discussion, Peer partner learning, Supplemental reading assignments, Video lessons, Learning by doing, Skilful questioning, Self-activity and observation

**Course Outcomes (COs):**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Assess the soundness of foundation and coherence theories	K5
CO2	Evaluate the externalism and epistemic norms	K5
CO3	Interpret the theories on epistemic concepts	K5
CO4	Estimate the strengths and weaknesses of theories of truth	K5
CO5	Consider the implications of applied epistemology	K5

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	-	3	1	-	-	-	1	3	2	3	1	3	20
CO2	3	-	3	1	-	-	-	-	3	2	3	1	3	19
CO3	3	2	2	2	1	-	-	2	3	2	3	1	3	24
CO4	3	3	3	2	1	-	1	2	3	2	3	1	3	27
CO5	3	2	2	3	2	-	3	3	3	2	3	2	3	31
Grand Total of Cos with POs & PSOs													121	
Mean value of COs With PSOs & POs = 121/52													2.33	

1: Low 2: Medium 3: High “-”: no correlation

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.33
Observation	COs of Philosophy of Knowledge: Contemporary Approach are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514

DEPARTMENT OF PHILOSOPHY

Class : B.A. Philosophy

Part : Core - 8

Semester : V

Hours : 75

Course Code : 22UPHC85

Credit : 04

GENERAL METAPHYSICS

(For those who joined in June 2022 onwards)

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**Course Objectives:**

This course helps the students to be aware of the inevitable importance of Metaphysics in the search for meaning of Reality describing the world of reality beyond sensual comprehension. It facilitates the learners to appreciate the different perspectives different metaphysicians adopted to know reality and to involve them to value a realistic Metaphysics that given an objective interpretation of Reality so as to examine in order to generate the personalistic orientation of Metaphysics and to show how it forms the basis of different world views.

**COURSE CONTENT:**

**Unit 1: Definition and Scope of Metaphysics**

**15 hours**

Meaning and Definitions – Divisions of Metaphysics – Relationship with other Sciences – Starting Point of Metaphysics – Place of Metaphysics in our search for Truth – Metaphysics as a Valid Discipline (Aristotle and Thomas Aquinas) – Concept of Being – Three Degrees of abstraction – Being as a notion that embraces all reality – Analogy of Being– First Principles of Being – Metaphysics as a priori and as Universal science

**Unit 2: Properties and Problems of Being**

**15 hours**

Understanding of Being as Analogical and its kinds – Transcendental of Being: Being as One, True, Good and Beautiful – Problem of the One and the Many – Problem of Permanence and Change – Principles of Act and Potency – Problem of Freewill and Determinism – Existence of Freedom

**Unit 3: Extrinsic Principles and Categories of BEING**

**15 hours**

Principle of Causality: Relevance, Intrinsic, Extrinsic, and their relation – Similarity of effects to their causes – Causal structure of the Universe: Substance and Accidents – Categories and Determinants of Being – Samkhya, Vaisheshika and Advaita categories – Composition of Substance: Essence and Act of Being – Distinction between Essence and Act of Being – Being as Subsisting Subject – Person as the highest expression of Reality – Ontological Dimension of Human Person

**Unit 4: Theories of Reality**

**15 hours**

**Monism:** Monism of Spinoza – Arguments against Dualism – Argument against Pluralism **Dualism:** Dualism of Plato and Kant – Two types of elements – Dualism in Human body – Justification by Common sense

**Pluralism:** Facts of Universe – Pluralism of Plato, Leibniz, Russell and Early Wittgenstein

**Unit 5: Debate on Metaphysics**

**15 hours**

**Impossibility of Metaphysics:** Metaphysics as pseudo-science (Logical Positivists) – Knowledge conditioned by time and space (Transcendental Idealist) creates confusion (Language Analysts)

-General comments

**Possibility of Metaphysics:** Metaphysics as Super Science (Ancient & Medieval Philosophers) – Oldest of all disciplines (Transcendental Idealist) – Understanding of Being by Heidegger, Sartre and Levinas – General comments

**Books for Study:**

1. Francis, J. B. (2005). *The philosophy of being*. St. Peter's.
2. Desbruslasis, C. (1997). *The philosophy of be-ing: Introduction to a metaphysics for today*. Jnana Deepa Vidyapeeth.
3. Klubertanz, G. P. (2005). *Introduction to the philosophy of being*. Wipf and Stock Publishers.
4. Owens, J. (1994). *Elementary Christian metaphysics*. University of Notre Dame Press.

**Books for Reference:**

1. De Raeymaeker, L. (1966). *Philosophy of being*. Herder Book Company.
2. Gilson, E. (1961). *Being and some philosophers*. Pontifical Institute of Medieval Studies.
3. Koren, H. J. (1955). *Introduction to the science of metaphysics*. Herder Book Co.
4. Maritain, J. (1949). *Existence and the existent*. Pantheon Books.
5. Maritain, J. (1979). *Preface to metaphysics*. Arno Press.

**Teaching and Learning Methods:**

- Lecture, ICT, Reading and Summarizing, Assignment Work, Library work, Class Presentation

**Course Outcomes (COs)**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Identify the importance of Metaphysics to have a meaningful understanding of Reality	K2
CO2	Justify the domain of essence of Reality	K5
CO3	Appraise means of knowing Reality	K5
CO4	Support objectification of Reality in life	K5
CO5	Relate the personalistic orientation of Metaphysics with different world views	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
<b>CO1</b>	3	1	2	2	3		2		3	2	1	3	2	24
<b>CO2</b>	3	3		2	2	1		1	2	3	2	2	2	23
<b>CO3</b>	2	1	1	2	3	2			3	2	1	3	2	22
<b>CO4</b>	3	2		3	3	2	2		3	2	2	3	2	27
<b>CO5</b>	2	3	2	2	2	1		1	2	2	2	3	3	25
Grand Total of Cos with POs & PSOs													121	
Mean value of COs With PSOs & POs = 121/56													2.16	

1: Low    2: Medium    3: High    "-": no correlation

Mapping Scale	1	2	3
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>2.16</b>
<b>Observation</b>	<b>COs of General Metaphysics are strongly correlated with POs &amp; PSOs</b>		

ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514

DEPARTMENT OF PHILOSOPHY

Class : B.A. Philosophy

Part : Core - 9

Semester : V

Hours : 75

Course Code : 22UPHC95

Credit: 04

PHILOSOPHY OF GOD AND RELIGION

(For those who joined in June 2022 onwards)

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**Course Objectives:**

This paper examines the religious phenomenon and makes a philosophical enquiry into the existence, nature and attributes of God. It aims at giving a rational basis to one's own religious faith and helps one to develop a positive attitude to other faiths.

**COURSE CONTENT:**

**Unit 1: Scope and Method of Study of Religion 15 hours**

Definition of Religion – Approaches to the Study of Religion: Historical, Anthropological, Sociological, Philosophical, and Comparative – Basic categories of Religions: Monotheism and Polytheism – Religion in relation to sociology, theology, and ethics.

**Unit 2: Grounds for Disbelief and Belief in God 15 hours**

Grounds for disbelief in God: Materialism, Evolving Sociological and Psychological Theories, Agnosticism, and Atheism – Grounds for belief in God: Ontological Arguments of Anselm – Theism and Probability – Moral Arguments of Emmanuel Kant.

**Unit 3: The problem of Religious beliefs and Verification 15 hours**

Basic religious beliefs – The foundational religious belief – The risk of belief – The question of verifiability – The idea of Eschatological verification – Some difficulties and complications – Exists – Fact – Real.

**Unit 4: The problems of religious language and Mystical experience 15 hours**

Peculiarity of Religious Language – Religious Language as Analogy – Symbolic – Non-cognitive – Braithwaite's view – Mystical experience and its characteristics – Antony Flew's rejection and its appropriation.

**Unit 5: Philosophical Understanding of Religious pluralism 15 hours**

The Fact of Religious Pluralism: Inclusive and Exclusive – Issues and Challenges – Conflicting truth claims of different religions – A possible solution – Need and Significance of Interreligious Dialogue.

**Books for Study:**

1. Hick, H. J. (1991). *Philosophy of Religion*. Prentice-Hall of India private limited
2. Lyden, J. (1995). *Enduring Issues in Religion*. Greenhaven Press.

3. Marx, K., & Engels, F. (2008). *On Religion*. Dover Publications.
4. Masih, Y. (2017). *Introduction to Religious Philosophy*. Motilal Banarsidass.
5. Sekhar, V. (2006). *Practice of Interreligious Dialogue – A Formation Manuel*. Claretian Publications.

**Books for Reference:**

1. Dean, T. (1997). *Religious Pluralism and Truth: Essays on Cross-cultural Philosophy of Religion*. Sri Satguru Publications.
2. Madan, T. N. (2011). *India's Religions: Perspectives from Sociology and History*. Oxford University Press.
3. Nigosian, S. A. (1994). *World Faiths*. St. Martin's Press.
4. Weber, M. (2015). *Fundamental Concepts in Max Weber's Sociology of Religion*. Palgrave Macmillan.

**Website Links for Study:**

1. <https://guides.lib.jmu.edu/philosophy>
2. <https://philosophy.eku.edu./philosophy-religion>

**Teaching and Learning Methods:**

- Lecture/PPT/Videos (LCT), Class Presentation (LCT), Written Assignment, Field Visit and Individual's sharing of experiences

**Course Outcomes (COs)**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Understand the scope and the method of study of Religion and its relation to fields like sociology, theology, and ethics	K2
CO2	Understand the divine essence and divine intellect and will through that they able to analyse the nature and attributes of God.	K4
CO3	Understand the grounds for disbelief and belief in God through that they able to analyse the reality of God.	K4
CO4	Know the different faith traditions and their believers and apply them in order to understanding that foster unity	K3
CO5	Assess the nature of Truth and its claims by all religious traditions in dialogue with one another and how they foster harmony and good-will	K5

**K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create**

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
<b>CO1</b>	3	2	-	1	2	2	-	1	2	2	2	1	2	20
<b>CO2</b>	2	3	2	2	-	2	2	2	3	-	1	2	3	24
<b>CO3</b>	3	2	-	3	3	2	2	-	2	3	2	3	-	25
<b>CO4</b>	-	2	3	2	3	-	2	2	3	2	-	2	3	24
<b>CO5</b>	2	2	3	1	-	2	2	-	3	2	2	1	-	20
Grand Total of Cos with POs & PSOs													113	
Mean value of COs With PSOs & POs = 113/52													2.17	

1: Low 2: Medium 3: High “-”: no correlation

Mapping Scale	1	2	3
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>2.17</b>
<b>Observation</b>	<b>COs of Philosophy of God and Religion are strongly correlated with POs &amp;PSOs</b>		

ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514

DEPARTMENT OF PHILOSOPHY

Class : B.A. Philosophy

Part : Core - 10

Semester : V

Hours : 75

Course Code : 22UPHD05

Credits : 04

MORAL PHILOSOPHY

(For those who joined in June 2022 onwards)

**Course Objectives:**

The course introduces the students to the world of ethics and morality to analyse and evaluate its basics, modern ethical theories, and alternative ethical perspectives, along with Indian ethics. It also deals with theories of punishments and some issues of importance.

**COURSE CONTENT:**

**Unit 1: Basics of Ethics**

**15 hours**

(A) Nature, Scope, and Relevance of Ethics – Moral and Non-Moral Actions – Determinants of Moral Act; (B) Types Of Ethics: Normative Ethics – Meta-Ethics – Applied Ethics; (C) Relation with God and Freedom; (D) Ethics as the First Philosophy

**Unit 2: Ethical Theories**

**15 hours**

(A) Three types of Egoism; (B) Moral Relativism: Subjective Relativism – Emotivism – Cultural Relativism; (C) Moral Realism: Naturalism – Intuitionism – Supernaturalism; (D) Moral Quasi-realism: Rational Constructivism – Prescriptivism

**Unit 3: Alternative Ethical Perspectives**

**15 hours**

Transvaluation of Nietzsche – Existentialist Ethics of Sartre – Discourse Ethics of Habermas – Feminist Ethics of Gilligan – Environmental Ethics – Animal Rights

**Unit 4: Indian Ethics**

**15 hours**

(A) Law of Karma – Svadharma – Varna Dharma – Niskāma Karma – Lokasamgraha; (B) Ethics of Cārvāka – Maha-vratas – Brahma-viharas and Bodhisattva; (C) Ethical Teachings of Thirukkural – Ambedkar on Caste-bound Morality

**Unit 5: Some Moral Issues and Theories of Punishment**

**15 hours**

(A) Moral Issues: Euthanasia – Suicide – Same-sex and Transgender Rights – War; (B) Theories of Punishment: Deterrent Theory – Reformatory Theory – Retributive Theory – Capital Punishment

**Books for Study:**

1. Baggini, J., & Fosl, P. S. (2007). *The ethics toolkit: A compendium of ethical concepts and methods*. Blackwell Publishing.
2. Deigh, J. (2010). *An introduction to ethics*. Cambridge.
3. Dimmock, M., & Fisher A. (2017). *Ethics for A-level*. Open Book Publishers.
4. Sharma, I. C. (1965). *Ethical philosophies of India*. Allen & Unwin.  
[https://ignca.gov.in/Asi\\_data/43256.pdf](https://ignca.gov.in/Asi_data/43256.pdf)

### Website Links for Study:

1. <https://iep.utm.edu/home/about/>
2. <https://www.newworldencyclopedia.org/>
3. <https://www.studocu.com/in/document/ifim-college/law/critical-analysis-of-theories-of-punishment-1/34596281>

### Books for Reference:

1. Becker, L. C., & Becker C. B. (Eds.). (2003). *A history of Western ethics* (2<sup>nd</sup> ed.). Routledge.
2. Gibson, K. (2014). *An introduction to ethics*. Pearson.
3. Nuttall, J. (1993). *Moral questions: An introduction to ethics*. Polity Press.

### Teaching and Learning Methods:

- Lectures and dialogues, Essays (Persuasive / Expository), Reflective Group discussion, Peer partner learning, Supplemental reading assignments, Video lessons, Learning by doing, Skilful questioning, Self-activity and observation

### Course Outcomes (COs):

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Consider the basics of ethics and egoism	K5
CO2	Estimate the modern ethical theories	K5
CO3	Evaluate the alternative ethical perspectives	K5
CO4	Interpret the strengths and weaknesses of Indian ethics	K5
CO5	Assess the theories of punishment and some moral issues	K5

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

### Mapping COs with POs and PSOs:

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3	3	3	2	1	-	-	3	3	3	3	3	30
CO2	3	3	2	2	2	1	-	-	3	1	3	2	2	24
CO3	3	3	2	3	1	1	-	-	3	3	3	3	2	26
CO4	3	3	3	3	2	1	-	-	3	2	3	2	3	28
CO5	3	3	3	2	2	1	-	-	3	3	3	2	3	38
Grand Total of Cos with POs & PSOs													136	
Mean value of COs With PSOs & POs = 136/52													2.62	

1: Low 2: Medium 3: High “-”: no correlation

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.62
Observation	COs of Moral Philosophy are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514

DEPARTMENT OF PHILOSOPHY

Class : B.A. Philosophy Part : Core - 11  
Semester : V Hours : 75  
Course Code : 22UPHD15 Credits : 04

POSTMODERN PHILOSOPHY

(For those who joined in June 2022 onwards)

**Course Objectives:**

The course is introduced to provide an insight into the postmodern way of viewing the world. It is designed in such a way to differentiate it from the other western philosophical traditions such as pre-modern and modern understanding of the world. It helps the students to construct the world view of their own through understanding the postmodern ethos.

**COURSE CONTENT:**

- Unit 1: Postmodernism as Reaction toward Modernism** **15 hours**  
(A) Meaning and Definition of Modernism and Postmodernism; (B) Features of modernism; (C) Critique of Modernism in the light of Postmodernism; (D) Characteristics of Postmodernism
- Unit 2: Historical Development of Postmodernism** **15 hours**  
(A) Critique of Medieval European Culture; (B) Critique of Renaissance European Culture; (C) Critique of Modern Philosophy of Descartes, Locke, Hume, Kant, Hegel; (D) Nietzsche's Critique of Modernism
- Unit 3: Transition from Structuralism to Poststructuralism** **15 hours**  
(A) Meaning and Definition of Structuralism; (B) Semiotics and Structuralist's Analysis of meaningfulness; (C) Meaning and Definition of Poststructuralism
- Unit 4: Postmodern Thinkers** **15 hours**  
(A) Jean Francois Lyotard – Postmodern Condition; (B) Jean Baudrillard – Simulacra and Simulation; (C) Jacques Derrida – Deconstruction; (D) Michel Foucault – Power and Knowledge
- Unit 5: Impact of Postmodern Ethos** **15 hours**  
(A) Postmodern Lifestyle; (B) Postmodern Popular Culture – Art – Literature; (C) Postmodern Science and Technology – Film; (D) Postmodern Feminism; (E) Postmodern Environmentalism

**Books for Study:**

1. Butler, C. (2008). *Postmodernism: A very short introduction*. Oxford University Press.
2. Hicks, S. R. C. (2014). *Explaining postmodernism: Skepticism and socialism from Rousseau to Foucault*. Ockham's Razor Publishing.
3. Powell, J. (1998). *Postmodernism for beginners*. Orient BlackSwan.

**Books for Reference:**

1. Connor, S. (2005). *The Cambridge companion to postmodernism*. CUP.
2. Grenz, J. & Stanley (1996). *A primer on postmodernism*. Wm B. Eerdmans Pub. Co.

3. Haber, H. F. (1994). *Beyond postmodern politics*. Routledge.
4. Lewis, P. (2007). *The Cambridge introduction to modernism*. CUP.

**Website Links for Study:**

1. <https://pressbooks.online.ucf.edu/introductiontophilosophy/chapter/what-is-postmodernism/>
2. [https://youtu.be/5D86\\_ptqd8I?si=434ZGiMu0-jOfMhU](https://youtu.be/5D86_ptqd8I?si=434ZGiMu0-jOfMhU)

**Teaching and Learning Methods:**

- ICT enabled lecture method, Assignment, Class presentation, and Group discussion

**Course Outcomes (COs):**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Analyse the difference between modernism and postmodernism	K4
CO2	Understanding the lacunae in modernism and realize the need for postmodernism	K2
CO3	Evaluate the structuralist and poststructuralist analysis of meaning	K5
CO4	Assess and evaluate the postmodern society and culture	K5
CO5	Form their own view of the world through postmodern understanding	K6

**K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create**

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3	-	2	2	1	-	1	2	2	3	3	3	25
CO2	2	3	-	2	3	1	-	2	2	3	2	3	2	25
CO3	2	2	-	2	2	3	2	3	2	2	2	3	3	28
CO4	3	3	-	2	2	1	1	2	3	1	2	3	2	25
CO5	1	2	-	3	1	-	-	1	2	3	3	3	2	21
Grand Total of Cos with POs & PSOs													124	
Mean value of COs With PSOs & POs = 124/56													2.21	

1: Low                      2: Medium                      3: High                      "-": no correlation

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			<b>2.21</b>
Observation	<b>COs of Postmodern Philosophy are strongly correlated with POs &amp; PSOs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF PHILOSOPHY

Class : B.A. Philosophy Part : SBE – 1a  
Semester : V Hours : 45  
Course Code : 22UPHI15 (a) Credits : 02

APPLIED PSYCHOLOGY

(For those who joined in June 2022 onwards)

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**Course Objectives**

This course aims at developing an understanding of the growing discipline of applied psychology and promoting skill based education. The course intends to enable students in developing skills and competencies needed for meeting the challenges and needs of the real world in an effective way.

**COURSE CONTENT:**

**Unit I: Introduction**

**9 hours**

Definition of Applied Psychology – Nature and scope of Applied Psychology – Historical development in applied psychology – Biological basis Neuron – Structure and function of Nervous system.

**Unit II: Educational Psychology**

**9 hours**

Growth and Development – Mental, Emotional and Social Development during childhood, and adolescence – Factors affecting learning Attention, Perception, and Motivation – Effective teaching – Learning methodologies – Classroom management.

**Unit III: Positive Psychology**

**9 hours**

Introduction to Positive Psychology – Assumption and Goals of Positive Psychology – Eastern and Western Perspectives of Positive Psychology – Happiness: Hedonic and Eudaemonic Approach to Happiness – Positive Emotion: Cultivating Positive Emotion.

**Unit IV: Counselling Psychology**

**9 hours**

Meaning – Nature; – Definition and Scope of counselling – Differences between counselling and psychotherapy – Counselling settings – Stages of counselling interview (Ivey's model) – Carl Rogers historical development and evaluation.

**Unit V: Community Psychology**

**9 hours**

Theoretical concepts of community psychology: Individual wellness – Sense of community – Psychological sense of community – Social justice – Collaborative community strength – Human diversity and empirical grounding – Primary, secondary and tertiary prevention.

**Books for Study:**

1. Bandura, A. (1969). *Principles of behavior modification*. New York: Holt, Rinehart and Winston.
2. Belsky, J., & Cassidy, J. (1994). *Attachment and close relationships: An individual-difference perspective*. *Psychological Inquiry*, 5, 27-30.
3. Carr, A. (2011). *Positive psychology: The science of happiness and human strengths*. Routledge.
4. Ivey, A. E., & Ivey, M. B. (2001). *Intentional interviewing & Counselling*. Thomson: Brooks/Cole

**Books for Reference:**

1. Bierhoff, H. W. (2002). *Prosocial behaviour*. Psychology Press
2. Broadbent, D. E. (1958). *Perception and Communication*. London: Pergamon Press.
3. Cantor, N., & Kihlstrom, J. F. (1987). *Personality and Social Intelligence*. Englewood Cliffs, NJ: Prentice-Hall.
4. Kumar, V., & Talwar, R. (2014). *Determinants of psychological stress and suicidal behavior in Indian adolescents: a literature review*. Journal of Indian Association for Child & Adolescent Mental Health, 10(1).

**Website Links for Study:**

1. <https://guides.lib.umich.edu/c.php?g=282764&p=4180576>
2. <https://www.apple.com/in/logic-pro/resources/>

**Teaching and Learning Methods:**

Lecture, ICT, Student's personal reading and assignment, Group discussion, and Class presentation

**Course Outcomes (COs):**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Understand the basic nature and scope of applied psychology and their applications in real-world settings.	K3
CO2	Analyse and acquire the knowledge of right to education, inclusive policies and ethical issues.	K4
CO3	Apply the basic concepts from the course to an analysis of their own lives and personal strength.	K4
CO4	Learn the basic concepts and theories of counselling and apply the important skills and evaluate them required in life.	K5
CO5	Understand the theoretical concepts of community psychology and evaluate the parameters for measuring quality of life and strength of empowerment.	K5

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	2	-	3	-	2	-	1	3	2	1	3	2	22
CO2	2	3	1	2	2	2	1	2	3	3	-	2	2	25
CO3	1	2	2	3	2	3	2	2	2	-	2	3	-	24
CO4	-	2	2	2	3	2	2	-	3	2	2	2	3	25
CO5	2	2	3	1	2	1	2	3	3	2	2	-	3	26
Grand Total of Cos with POs & PSOs													122	
Mean value of COs With PSOs & POs = 122/56													2.17	

1: Low 2: Medium 3: High “-”: no correlation

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>2.17</b>
<b>Observation</b>	<b>COs of Applied Psychology are strongly correlated with POs &amp; PSOs</b>		

ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514

DEPARTMENT OF PHILOSOPHY

Class : B.A. Philosophy

Part : SLC

Semester : V

Credits : 03

Course Code : 22UPHSL5

**NATURAL THEOLOGY: CLASSICAL PERSPECTIVES**

(For those who joined in June 2022 onwards)

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**Course Objective:**

This course critically examines the definitions, assumptions, argumentations regarding the existence and the nature of God, the creation, and the problem of evil. It analyses the arguments for and against the existence of God critically. It clarifies the attributes of God such as, Omni-benevolence, Omniscience, Omnipotence, and Omnipresence. It also discusses at length the problem of evil and the relation between God and the world. The aim of the course is to establish the rational justification for God's existence and his divine attributes, and to affirm the intimacy between the God and the world.

**Unit I: Introduction**

Historical Beginnings of the Theology and Philosophy – Ancient Philosophy and the First Principles – Distinction between 'Revealed' and 'Natural' Approaches to Faith in God - Modern Philosophy and Natural Theology

**Unit II: Existence of God**

*A Priori* Arguments: Ontological Argument by St. Anselm of Canterbury and Rene Descartes, Moral Argument by Immanuel Kant

*A Posteriori* Arguments: Thomas Aquinas' Cosmological Proofs – Arguments from Religious Experience by William James

Proofs from the Indian traditions Nyaya and Vedanta

Criticism for and against the Proofs of God

**Unit III: Knowledge, Activities, and Attributes of God**

Problem of the Knowledge of God's essence – Analogical Approach in Understanding God – Analogy by Affirmation, Negation, and Eminence – Divine Names – Divine Attributes

**Unit IV: Creation**

Philosophical Accounts of Creation by Augustine, Thomas Aquinas, and Bonaventure

– Creationism vs. Evolutionism

**Unit V: The Problem of Evil and Suffering**

Etymology – Kinds of Evil – World Religions on Evil and Suffering – Response to the problem of evil and suffering by Irenaeus, Augustine, and Thomas Aquinas in the West and Sankhya, Buddhism and Advaita in India

**Books for Study:**

1. Leibniz, W. G. (2007). *Theodicy: Essays on the goodness of god, the freedom of man and the origin of evil*. Bibliobazaar.

2. Huxford G. (2020). *Kant and theodicy: A search for an answer to the problem of evil*. Lexington Books.
3. Tilley, T. W. (2000). *The evils of theodicy*. Wipf & Stock Eugene.
4. Rodin, R. S. (1997). *Evil and theodicy in the theology of Karl Barth*. Peter Lang Bern.
5. Rowe, W. L. (Ed.). (2001). *God and the problem of evil*. Blackwell Malden.

**Website Links for Study:**

1. Bhattacharyya, J. (2023). The problem of evil: Some Indian approaches. Bulletin of the Ramakrishna Mission Institute of Culture. URL = <https://sriamkrishna.org/wp-content/uploads/2023/11/The-Problem-of-Evil-Some-Indian-Approaches-by-JOY-BHATTACHARYYA.pdf>
2. Harrison, P. (1997). Criticism for and against the existence of God. URL = <http://pespmc1.vub.ac.be/GODEXIST.html>
3. Handout – The problem of evil & theodicies of Augustine and Irenaeus. (2018). URL = <https://peped.org/philosophicalinvestigations/handout-problem-evil/>
4. Laracy, J. (2022). A Course on the relationship of the theology of creation and the natural sciences. URL = <https://seminaryjournal.com/theology-of-creation-and-natural-sciences/>
5. Vattanky, J. (2007). Proof for the existence of God In classical Indian philosophy. Forum Philosophicum. URL = [https://forumphilosophicum.ignatianum.edu.pl/docannexe/file/6328/1.\\_vattanky.pdf](https://forumphilosophicum.ignatianum.edu.pl/docannexe/file/6328/1._vattanky.pdf)

**Course Outcomes (COs):**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Critically analyze the origin, development of the natural theology and distinguish between Theodicy, Philosophy of Religion and Revealed Theology.	K4
CO2	Have a conviction on the existence of God and increase his/her faith in God	K3
CO3	Appreciate God's relation to man.	K5
CO4	Value God's presence in the world and become faithful steward of God's creation.	K5
CO5	Have a critical understanding about the problem of evil and suffering and appreciate the beauty of life amidst evil and suffering.	K5

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
<b>CO1</b>	3	1	1	-	-	-	-	-	2	1	2	1	2	13
<b>CO2</b>	3	2	2	1	2	-	-	1	3	3	3	3	2	25
<b>CO3</b>	3	2	2	1	1	-	1	1	3	3	3	2	2	24
<b>CO4</b>	3	3	2	1	1	-	1	1	3	3	3	2	2	25
<b>CO5</b>	3	3	2	1	2	-	1	1	3	3	3	3	2	27
Grand Total of Cos with POs & PSOs													114	
Mean value of COs With PSOs & POs = 114/55													2.07	

1: Slight (Low)    2: Moderate (Medium)    3: Substantial (High)    "-": no correlation

Mapping Scale	1	2	3
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>2.07</b>
<b>Observation</b>	<b>COs of Natural Theology: Classical Perspectives are strongly correlated with POs &amp; PSOs</b>		

ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514

DEPARTMENT OF PHILOSOPHY

Class : B.A. Philosophy Part : Core - 12  
Semester : VI Hours : 75  
Course Code : 22UPHD26 Credits : 05

MODERN AND CONTEMPORARY INDIAN THOUGHT  
(For those who joined in June 2022 onwards)

**Course Objectives:**

This course introduces to the students the characteristic features of contemporary Indian thought and helps them appreciate the contemporary Indian thinkers who have contributed to the field of renaissance and later became leaders in the society. Besides this course connects ideas of Indian thinkers with western philosophy, in order to apply different aspects of humanism in life and to evaluate the philosophy of contemporary Indian thinkers and perspectives.

**COURSE CONTENT:**

**Unit 1: Socio-Political Background 15 hours**

a) Socio- Economic-Political scenario b) Characteristic features of contemporary Indian Thought - Link with the past-Monothemism - Linear view of history-Interest in secular and social life. C) Scientific spirit - Nationalism - communalism.

**Unit 2: Rise of the Reform Movements and Reformers 15 hours**

a) Brahmo Samaj b) Arya Samaj c) Theosophical society d) Ramakrishna mission e) Sree Narayana Guru f) Jyotiba Phule.

**Unit 3: Evolutionary and Revolutionary Indian Thought 15 hours**

a) Neo Vedantism; b) Nature and Destiny of Man; c) Integral Yoga; d) Evolution of Gnostic Society e) Dr. B.R. Ambedkar and Hindu Social System

**Unit 4: Humanistic Trends 15 hours**

a) Religious Humanism of Tagore; b) Radical Humanism of M.N.Roy; c) Social Humanism of Ramalinga Swamigal; d) Sarvodaya of Gandhi e) Political Humanism of Jayaprakash Narayan.

**Unit 5: Non-Conventional Ideologies 15 hours**

i) J. Krishnamurti - a) Freedom from known b) Choiceless awareness  
ii) Rajneesh - a) Neo-Sannyasa b) Religiosity

**Books for Study:**

1. Lal. B.K. *Contemporary Indian Philosophy*. Moitlal Banarassidas. Madras. 1995.
2. Naravane. V.S. *Modern Indian Thought*. Asia Publication House. New Delhi. 2008.

**Books for Reference:**

1. Mahadevan, T.M.P., & Saroja, G.V. (1980). *Contemporary Indian Philosophy*. Bhardiya Vidya Bahavan Pub.
2. Ambedkar, B.R. (2016). *Philosophy of Hinduism*. Samyak Prakashan.
3. David Selbourne. (1996). *In theory and in Practice: Essays on the Politics of Jayaprakash Narayan*. Oxford University Publications.

### Web Links for Study:

1. [https://sde.uoc.ac.in/sites/default/files/sde\\_videos/SLM-%20Philo%20Contemporary%20%20Inidan%20%20Philosophy.pdf](https://sde.uoc.ac.in/sites/default/files/sde_videos/SLM-%20Philo%20Contemporary%20%20Inidan%20%20Philosophy.pdf)
2. <https://egyankosh.ac.in/handle/123456789/33329>
3. <https://archive.nptel.ac.in/courses/109/101/109101002/>
4. <https://www.britannica.com/biography/Ram-Mohan-Roy>

### Teaching and Learning Methods:

ICT enabled lecture method, Assignment, Class presentation and Group discussion.

### Course Outcomes (COs)

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Develop an in-depth and comprehensive understanding of the contemporary Indian thought	K2
CO2	Appreciate and analyse the different reform movements and the contributions of reformers	K5
CO3	Understand and evaluate the philosophical notions of contemporary thinkers	K5
CO4	Understand the important value of humanism and apply it in the society	K3
CO5	Evaluate the philosophical approach of contemporary thinkers	K5

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, K6 = Create

### Mapping COs with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	2	1	-	2	-	1	2	3	3	2	2	2	23
CO2	2	3	3	2	-	2	-	2	2	2	2	2	2	24
CO3	2	3	2	2	3	2	1	2	3	2	1	2	3	28
CO4	3	2	2	2	-	2	-	-	2	3	3	2	2	23
CO5	2	3	2	2	3	1	1	1	3	2	2	3	2	27
Grand Total of COs with POs & PSOs														125
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{125}{58}$														2.16

1: Low 2: Medium 3: High “-”: no correlation

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.16
Observation	COs of Modern and Contemporary Indian Thought are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514

DEPARTMENT OF PHILOSOPHY

Class : B.A. Philosophy

Part : Core - 13

Semester : VI

Hours : 75

Course Code : 22UPHD36

Credit : 04

PHILOSOPHICAL ANTHROPOLOGY

(For those who joined in June 2022 onwards)

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**Course Objectives:**

This course helps the students introduced of the philosophical concept of human person and human origin with the aim of enkindling their enthusiasm to be familiarized of the specific traits of intellect, tendencies, relationality, and creativity that shine forth in the daily life of an individual. It paves ways to the students to get themselves acquainted with the transcendence and self-fulfilment of human person that serves to the complete comprehension of human reality

**COURSE CONTENT:**

**Unit 1: Understanding the Philosophical Study of Human Person and Its Method 15 hours**

(A) Specific Character and Definition of philosophical anthropology – Existential questions – Method and main problems of philosophical anthropology; (B) Western Concept of Human Person: Greek, Medieval, Modern, and Contemporary views; (C) Indian Concept of Human Person: Classical and Contemporary views

**Unit 2: Characteristics and Origin of Human Being 15 hours**

(A) Life: Immanence and transcendence – Characteristics of life (structural and operational) – Degrees of life (vegetative, sensitive, and intellective); (B) Vital Principle: Substantial form – Principle of operations – Characteristics; (C) Living Body: Body as system – Notion of organ – Soul-body relationship – Corporeity; (D) Origins and Evolutionism – Cosmogogenesis, biogenesis, and anthropogenesis

**Unit 3: Human Intellect, Tendencies, and Affectivity 15 hours**

(A) Intellectual Knowledge: What and how we know – Self-knowledge – Intelligence and speech – Mind-body problem; (B) Tendency Dynamism: Instincts and human tendencies – Spiritual-type of tendency – Voluntariness of actions – Deterministic concepts; (C) Affectivity: Affectivity – Sensations, feelings, and moods – Dynamism of the feelings – Typology of the affections – Affectivity and freedom

**Unit 4: Human Person as a Socio-cultural and Creative Being 15 hours**

(A) Relationality: Social by nature – Social virtues – Self-fulfilment and society – Individualist conceptions and Collectivist conceptions; (B) Culture: Notion of culture – Three fundamental Elements (language, custom, and values) – Culture and society (“Three World Theory”); (C) Values: Orientation toward values – Metaphysical analysis of value (truth, goodness, and beauty); (D) Creativity: Notion of work (ecological and technological) – Feast – Play

## Unit 5: Destiny of Human Person

15 hours

(A) Death and Immortality: Monism, Dualism, and Duality – Problem of death – Immortality; (B) Theories of Survival after Death: Experiences of those who revived from death – Ethical Argument – Metaphysical Argument – Different models of immortality (Reincarnation, Nirvana, Resurrection and Transmigration); (C) Freedom and Self-fulfilment: Task of Self-fulfilment – Authentic Existence – Experience of Freedom – Experience of evil and pain – Self-transcendence [Integrated (holistic) view]

### Books for Study:

1. Darowski, R. (2014). *Philosophical anthropology: Outline of fundamental problems*. The Ignatianum Jesuit University in Cracow Publishing House WAM.
2. Lombo, J. A., & Russo, F. (2014). *Philosophical anthropology: An Introduction*. Midwest Theological Forum. Downers Grove.

### Books for Reference:

1. Battista, M. (1985). *Philosophical anthropology*. T.P.I.
2. Bogliolo, L. (1984). *Philosophical anthropology* (Vols. I & II). Sacred Heart Theological College.
3. Mercier, J. (1998). *Being human*. ATC.
4. Mouroux, J. (1982). *Meaning of man*. Doubleday & Co.
5. Omel, C. N. V. (2009). *The human being in contemporary philosophical conceptions*. Cambridge Scholars Publishing.

### Teaching and Learning Methods:

- Lectures, ICT, Assignment, Group Discussion, Class Presentation, Quiz, Framing questions on the basis of text

### Course Outcomes (COs):

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Analyse the existential questions and <b>evaluate</b> Western and Indian concepts of human person	K5
CO2	<b>Assess</b> the specific characteristics of human being and the theories of the origin of human person	K5
CO3	<b>Estimate</b> the human qualities of intellect, tendencies, and affectivity	K5
CO4	<b>Appraise</b> the strengths of human person as socio-cultural and creative being	K5
CO5	<b>Interpret</b> the tenability of human persons' desire for immortality and their claims of self-fulfillment	K5

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
<b>CO1</b>	3	3	2	3	1	1	-	-	3	3	3	3	2	27
<b>CO2</b>	3	3	1	3	1	-	-	-	3	2	3	2	2	23
<b>CO3</b>	3	3	3	2	2	2	-	-	3	3	3	2	2	28
<b>CO4</b>	3	3	3	3	2	2	-	-	3	3	2	2	2	28
<b>CO5</b>	3	2	2	2	-	1	-	-	3	3	3	2	2	23
Grand Total of Cos with POs & PSOs													129	
Mean value of COs With PSOs & POs = 129/53													2.43	

1: Low    2: Medium    3: High    "-": no correlation

Mapping Scale	1	2	3
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>2.43</b>
<b>Observation</b>	<b>COs of Philosophical Anthropology are strongly correlated with POs &amp; PSOs</b>		

ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514

DEPARTMENT OF PHILOSOPHY

Class : B.A. Philosophy Part : Core -14  
Semester : VI Hours : 75  
Course Code : 22UPHD46 Credits : 04

**METAPHYSICS: CONTEMPORARY ISSUES**

(For those who joined in June 2022 onwards)

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**Objectives:**

The course clarifies the most fundamental questions about what reality is like; questions about the contemporary understanding of Being; questions about the things that challenge realism; and questions about the legitimacy of metaphysics itself. It establishes the relationship between philosophy of science and metaphysics and tries to revitalize Aristotelian Substance Ontology.

**COURSE CONTENT:**

**Unit I: The Understanding of Being by the Western Contemporary Thinkers 15 hours**

Positive and Negative Understanding of Being in Reference to Martin Heidegger, Jean Paul Sartre, and Emmanuel Levinas

**Unit II: A Neo-Aristotelian Substance Ontology 15 hours**

Constituent Versus Relational Ontologies – Troubles with Transcendentalism and Hylomorphism – Four-Category Ontology – Four-Category Ontology not as Relational and Constituent Ontology

**Unit III: The Challenge of Anti-Realism 15 hours**

Two Views about the Nature of Reality – Dummett's Anti-Realism – Quine's Inscrutability of Reference – Putnam's Argument against Realism – Realism or Anti-Realism?

**Unit IV: Philosophy of Science and Metaphysics 15 hours**

Relationship between Philosophy of Science and Metaphysics – Naturalized Inductive Metaphysics – Debate between Empiricism and Realism and the Philosophy of Science – Christianity, Platonism, Aristotelianism, and the Scientific Revolution

**Unit V: Objections to Traditional Metaphysics 15 hours**

Empiricism – Scientism – Nominalism – Skepticism – Logical Positivism – Emergence of Metaphysics: Weak or Strong?

**Books for Study:**

1. Bigaj, T., & Wüthrich, C. (Eds.). (2016). *Metaphysics in contemporary physics*. Brill Rodopi.
2. Dilworth, C. (2006). *The metaphysics of science* (2<sup>nd</sup> ed.). Springer.
3. Luox, M. J. (2002). *Metaphysics: A contemporary introduction*. Routledge.
4. Macdonald, C. (2005). *Varieties of things: Foundations of contemporary metaphysics*. Blackwell.
5. Sider, T., Hawthorne, J., & Zimmerman, D. W. (Eds.). (2008). *Contemporary*

*debates in metaphysics*. Blackwell.

6. Tahko, T. E. (Ed.). (2012). *Contemporary Aristotelian metaphysics*. Cambridge University Press.
7. Woolhouse, R. S. (1988). *Metaphysics and philosophy of science in the seventeenth and eighteenth centuries*. Kluwer Academic Publishers.

#### **Books for Reference:**

1. Allan, G. (2020). *Whitehead's radically temporalist metaphysics: Recovering the seriousness of time*. Lexington Books.
2. Cowan, S. B. (Ed.). (2020). *Problems in epistemology and metaphysics: An introduction to contemporary debates*. Bloomsbury Publishing Plc.
3. Feser, E. (2014). *Scholastic Metaphysics A contemporary introduction*. Transaction Books.
4. Greenstine, A. J., & Johnson, R. J. (Eds.). (2017). *Contemporary encounters with ancient metaphysics*. Edinburgh University Press Ltd.
5. Llewelyn, J. (1985). *Beyond metaphysics? The hermeneutic circle in contemporary continental philosophy*. Humanities Press International. Inc.
6. Mays, W. (1977). *Whitehead's philosophy of science and metaphysics: An introduction to his thought*. Martinus Nijhoff.

#### **Website Links for Study:**

1. Empiricism. New World Encyclopedia. URL = <https://www.newworldencyclopedia.org/entry/Empiricism>
2. Khlentzos, D. (Spring 2021 Edition). "Challenges to Metaphysical Realism", The Stanford Encyclopedia of Philosophy. URL = <https://plato.stanford.edu/archives/spr2021/entries/realism-sem-challenge/>
3. Nominalism. New World Encyclopedia. URL = <https://www.newworldencyclopedia.org/entry/Nominalism>
4. Scientism. New World Encyclopedia. URI = <https://www.newworldencyclopedia.org/entry/Scientism>
5. Skepticism. New World Encyclopedia. URL= <https://www.newworldencyclopedia.org/entry/Skepticism>
6. Video Discussion on Anti-Realism - Searle & Putnam. URL = <https://www.youtube.com/watch?v=jt-9NS--o8Q>

#### **Teaching and Learning Methods:**

ICT enabled lecture method, Assignment, Class presentation, and Group Discussion

**Course Outcomes (COs):**

CO No.	At the end of the course, students will be able to	Knowledge Level up to
CO1	Naturalize the metaphysics of being to improve the ethical, religious and social standards of human life.	K3
CO2	Have a revised understanding about substance ontology of Aristotle that will explain the solidity of the universe and things.	K4
CO3	Become convinced that the world in which he/she lives is a real one and will start taking care of it.	K5
CO4	Justify metaphysics and its relevance amidst the development in science and technology.	K5
CO5	Critically approach the objections to traditional metaphysics and get the glimpse of the contemporary relevance of metaphysics.	K5

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	2	2	-	-	-	2	-	3	3	2	2	2	21
CO2	3	3	2	1	2	-	2	1	2	3	3	3	2	27
CO3	3	2	2	-	2	-	1	1	2	3	3	3	2	24
CO4	3	3	2	1	-	1	1	1	2	3	3	3	2	25
CO5	3	3	-	-	2	-	2	-	3	3	3	3	2	24
Grand Total of Cos with POs & PSOs													121	
Mean value of COs With PSOs & POs = 121/53													2.28	

1: Low 2: Medium 3: High “-”: no correlation

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.28
Observation	COs of Metaphysics: Contemporary Issues are strongly correlated with POs & PSOs		

**ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514**

**DEPARTMENT OF PHILOSOPHY**

**Class : B.A. Philosophy**

**Part : Core - 15**

**Semester : VI**

**Hours : 75**

**Course Code : 22UPHD56**

**Credits : 04**

**PHILOSOPHY OF SCIENCE**

(For those who joined in June 2022 onwards)

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**Course Objectives:**

The course is designed to provide the basics understanding in the philosophy of science and assess the scientific theories from the philosophical perspectives at the same time, philosophical inquiries to be in line with the scientific development.

**COURSE CONTENT:**

**Unit 1: Introduction**

**15 hours**

a) Introduction to Science: Meaning and definition – Nature – Scope – Origin of Modern Science; b) Philosophy of Science: Meaning and Definition – Principle of Demarcation; c) Historical Development: Pre-modern – Modern - Logical Empiricist – Kuhn’s Scientific Revolution – Popper’s Falsificationism – Feyerabend’s Epistemological Anarchism

**Unit 2: Scientific Inference**

**15 hours**

a) Scientific Reasoning: Deduction – Induction; b) Problem of Induction: Hume’s Problem – Causal Inference – Probability and Scientific Inference – Rule of Conditionalization; c) Scientific method: Formulation of Hypothesis – Formulation of Theory

**Unit 3: Explanation in Science**

**15 hours**

a) Hempel’s Covering Law Model: Deductive-Nomological Model – Inductive Statistical Model – Problem of Symmetry – Problem of Irrelevance; b) Pragmatic Theory of Explanation: Illocutionary Acts – Ordered Pair View – Evaluation of Pragmatic Theory; c) Unificationist Theory of Explanation: Kitcher’s Theory – Objection to Unificationist Account; d) Causal Explanation: Salmon’s Causal Mechanical Account – Mechanistic Explanation

**Unit 4: Changes and Revolutions in Science**

**15 hours**

a) Realism and Anti-realism: Scientific Realism and Anti-realism – The No Miracles’ Argument – Observable and Unobservable Distinction – Underdetermination Argument; b) Space and Time: Absolute and Relative; c) Quantum Mechanics – Uncertainty Principle; d) Purpose in Nature: Teilhard de Chardin’s Vision of the World

**Unit 5: Values in Science**

**15 hours**

a) Science and Human Interests: Decisions about Research Directions and Methods; b) Argument from Inductive Risk: Sceptical Responses to Inductive Risk – Direct and Indirect Roles for Values; c) Values and Objectivity of Science: Merton’s Ethos of

Science – Longino on Contextual Values; d) Feminism and Philosophy of Science d) Is Science Value Neutral

**Books for Study:**

1. Machamer and Silberstein (2002). *Philosophy of science*. Blackwell.
2. Okasha, Samir (2016) *Philosophy of science: A very short introduction*. Oxford University Press.
3. Staley, Kent W. (2014). *An Introduction to the philosophy of science*. Cambridge University Press.

**Books for Reference:**

1. Bird, Alexander (2003). *Philosophy of science*. Routledge.
2. Nandy, Ashis (1996). *Science, hegemony and violence*. Oxford Press.
3. Rosenberg, Alexander (2000). *The philosophy of science*. Routledge.
4. Roy, M.N. (1984). *Science and philosophy*. Ajanta.
5. Russell, Bertrand (1990) *The impact of science on society*. Unwin.

**Teaching and Learning Methods:**

- ICT enabled lecture method, Assignment, Class presentation and Group discussion

**Course Outcomes (COs)**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Understand the elements of science and philosophy of science	K2
CO2	Understand scientific inference and theorization	K2
CO3	Evaluate the better explanation in science	K5
CO4	Integrate the different world views to form their own	K6
CO5	Evaluate science and human interest and their value	K5

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of Cos with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3	2	2	2	1	-	-	3	3	3	3	2	27
CO2	3	3	2	2	2	1	-	-	3	3	3	3	2	27
CO3	3	3	2	2	2	1	-	-	3	3	3	3	2	27
CO4	3	3	2	2	2	1	-	-	3	3	3	3	2	27
CO5	3	3	2	2	2	1	-	-	3	3	3	3	2	27
Grand Total of Cos with POs & PSOs													135	
Mean value of COs With PSOs & POs = 135/55													2.46	

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) “-”: no correlation

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>2.46</b>
<b>Observation</b>	<b>COs of Philosophy of Science are strongly correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514**

**DEPARTMENT OF PHILOSOPHY**

**Class : B.A. Philosophy**

**Part : Core - 16**

**Semester : VI**

**Hours : 75**

**Course Code : 22UPHD66**

**Credit : 04**

**COMPREHENSIVE UNDERSTANDING OF PHILOSOPHY (Written and Viva)**

(For those who joined in June 2022 onwards)

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**Course Objectives:**

At the end of the UG Philosophy programme, in the sixth semester, Comprehensive knowledge on the given themes that were studied during the three-year BA Philosophy programme under Core, Core Elective and Allied courses is tested through viva voce as well as written examinations. It creates a comprehensive and integrated view of philosophical concepts that is helpful in forming personal conviction and social commitment.

**Comprehensive Understanding of Philosophy (Written)**

**1. Metaphysics: Principle of Causality**

a. Relevance of the Study of Causes b. Causal structure of the universe c. Intrinsic causes-material and formal d. Extrinsic causes efficient and final e. Relation among causes

**2. Natural Theology: Rational Approach to God and Evil**

a. God, His Properties, associated issues and solutions b. Principle of Sufficient Reason and Russell-Copleston Debate c. Design Argument, David Hume's rejection and Swinburn's defence of it d. Mystical Religious Experience, its characteristics, Antony Flew's rejection, and its appropriation e. Miracle, its different understandings, Hume's objection, and contemporary defence to it. f. The problem of Free-will and various responses to it

**3. Logic**

a. Validity and Soundness of a Deductive Argument: Methods and Rules b. Fallacies: Informal (verbal and nonverbal) c. Inductive Logic: Induction, Mill's methods and scientific hypothesis

**4. Philosophy of Knowledge**

a. Sources of knowledge: Perception, Inference, Memory and Testimony b. Theories on Truth c. Scepticism and Theories of Justification d. Knowledge versus understanding e. Generation and Transmission of Knowledge and Ignorance

**5. Philosophy of Man: Human Nature**

a. Aristotle-politikon zoon b. Victor Frankl—the will to meaning. c. Camus: the absurdity of existence d. Trans-humanism e. Evolutionary perspectives on human nature f. Richard Dawkins on morality g. Human beings as cultural species

## **6. Philosophy of Man: Freedom**

- a. Kant: Freedom is a uniquely human experience
- b. Behaviourism-illusion of free will
- c. Freud-tragic view of human nature
- d. Carl Jung-individuation
- e. Whitely Kaufman-freedom as a human condition

## **7. Philosophy of Man: Life after Death**

- a. Life before and life after death
- b. Nature and Immortality of the soul (extrinsic dependence)
- c. Reincarnation: "Proofs"; Presupposition and consequences
- d. Philosophical evidence (or "proofs") for life after death
- e. An integrated (holistic) view of life after death

## **8. Moral and Political Philosophy**

- a. Moral Relativism: Subjective Relativism, Emotivism and Cultural Relativism
- b. Moral Realism: Naturalism, Intuitionism and Supernaturalism
- c. Moral Quasi-realism: Rational Constructivism/Prescriptivism
- d. Anarchism, Absolutism, Liberalism, Conservatism
- e. Socialism, Marxism, Communism and Fascism
- f. Main features of Modern Democracy

## **9. Philosophy of Nature and Science**

- a. Mechanical Philosophy of Nature
- b. The significance of the relationship between the philosophy of science and history of science
- c. Theories of Relativity; Philosophical Implications
- d. Popper's theory of Falsification with its merits and demerits

## **10. History of Ancient and Medieval Philosophy**

- a. Plato: Theory of Ideas
- b. Aristotle: Theory of change (Teleology)
- c. St. Augustine: Theory of Seminal Reasons
- d. St. Thomas Aquinas: Five Ways to know God
- e. Duns Scotus: Faith and Reason
- f. William Ockham: Principle of Simplicity

## **11. History of Modern and Contemporary Philosophy**

- a. Descartes: Cartesian Method, Dualism and Rationalism
- b. Locke: Theory of Knowledge and Empiricism
- c. Hume: Scepticism, Theory of Knowledge and Empiricism
- d. Kant: Transcendental Idealism
- e. Nietzsche: Death of God
- f. Heidegger: Fundamental Ontology
- g. Sartre: Freedom and commitment
- h. Levinas: The Primacy of Ethics

## **12. Indian Studies**

- a. Atman, Brahman and Tat-tvam-asi in Vedanta
- b. Carvaka critique of religion
- c. Vaisesika metaphysical categories
- d. Dualism in Sankhya and Madhva
- e. Buddhist four noble truths
- f. Liberation in Sikhism and Islam.

### **Comprehensive Understanding of Philosophy (Viva Voce)**

#### **1. History of Philosophy in the West**

The main philosophical tenets of anyone from the following duo: a. Plato, Aristotle b. Augustine, Aquinas c. Descartes, Kant d. Sartre, Heidegger

#### **2. Metaphysics**

Metaphysics as the study of Being and of beings; the analogical understanding of being; implications of scholastic pairs of terms such as existence and essence,

substance and accident, act and potency; main scholastic categories of being; Samkhya, Vaisesika and Advaita categories of being. “Transcendentals”: Interconnectedness, Relevance and Scope; Positive and negative understanding of Being with special reference to Western contemporary thinkers—Heidegger, Sartre and Levinas.

### **3. Existence of God**

Distinguishing between ‘revealed’ and ‘natural’ approaches to faith in God; Phenomenological rejection versus ontological rejection of God’s existence in the thinking of Nietzsche; the issues involved with religious language; Rejection of God by Carvaka school and Jainism; Challenges of Hume and Russell to theism and theist response to the challenges; “proofs’ for the existence of God provided by Anselm, Aquinas and Descartes – as well as by the Indian traditions Nyaya and Vedanta; Critical Appraisal of these well-known proofs for God’s existence.

### **4. Problem of Evil (Theodicy) and Suffering**

The vexing question of evil and suffering and the possible responses from Western traditions with critical appraisal; Response to the problem of suffering offered by Irenaeus, Augustine, Thomas Aquinas and John Hick in the West and Sankhya, Buddhism and Advaita in India. The uniquely Christian difficulty of addressing the problem (or mystery) of evil (Theodicy) and philosophical attempts to resolve this difficulty by Richard Swinburne and Alvin Plantinga; ‘Radical evil’ of Kant and ‘banality of evil’ of Hannah Arendt in the context of Eichmann Trial; the relation between “thoughtlessness” and evil in the world as interpreted by Hannah Arendt in the context of totalitarianism.

### **5. Human Nature and Freedom**

The main characteristics of a human person (Scholastic understanding). The dichotomous understanding of the human person (body vs soul) and the problems and approaches surrounding such understanding. Some Hindu approaches (Atman and Brahman) to the understanding of the human person, especially human freedom and dignity; arguments for and against human freedom, and consequences of denying freedom; the need for a holistic understanding of the human person in understanding human freedom. Free will and the question of evil; The difficulty of speaking about human nature philosophically in a generalised sense when these interpretations involve specific worldviews and meaning systems evolved historically and culturally.

### **6. Human Destiny Negative and positive responses to life after death**

Proofs for the immortality of the Soul in Plato. Differences among the Platonic understanding of the “immortality of the soul’, Hindu understanding of “reincarnation of the soul”; the Buddhist conception of “nirvana” and the stages leading to it; philosophical attempts to provide evidence for life after death and an integrated (holistic) view on life after death.

## **7. Philosophy of Nature and Universe clarifying the notions: philosophy, science, observation and scientific method**

Aristotle's understanding of the Philosophy of Science. Fundamental claims of Logical positivism, historicism (Kuhn) and historical realism (Lakatos) in the philosophy of science; Contributions of Karl Popper to Philosophy of science. Theories of Geocentrism and Helio-centrism and their implications; Mechanical Philosophy of Nature and Newton's laws; Understanding of the universe as finite or infinite; Einstein's theory of relativity and Heisenberg's principle of uncertainty; scientific theories about the origin and end of the universe.

## **8. Epistemology and Hermeneutics**

Hermeneutics and its relation to, and distinction from, Epistemology; Gettler-cases: a new understanding of knowledge; basic hermeneutical principles like pre-understanding, understanding, historicity, textuality, hermeneutical circle, semantic autonomy, the fusion of horizons; epistemological questions regarding the meaning of truth, knowledge and certitude in different fields; means of knowledge (pramanas) in the West and Nyaya with critical appraisal; the theory of syadvada in Jainism and its significance. In India, the reality of epistemic exclusion of large sections of people within the caste context (adhikara) and its relation to social justice. Structures of knowledge in colonial India helped the upper castes to monopolise technical education; "Merit" or high marks as the accumulation of social advantages by the privileged classes, and "lack of merit" as the accumulation of social disadvantages of marginal sections in society.

## **9. Ethics**

The nature, scope and relevance of Ethics; Philosophical attempts of Utilitarianism and Deontology to distinguish between right and wrong actions with critical appraisal; Relation between God and morality on one hand and Freedom and morality on the other; Philosophical need for presumed objective criteria for moral judgment in the light of the meta-ethical theories proposed by subjective and objective schools of morality; the importance of virtue ethics and care ethics in the contemporary society; the significance of Habermas' Discourse Ethics and Levinas' affirmation of ethics as the first philosophy. Comment on Ambedkar's assertion in his Annihilation of Caste (1936) that a Hindu's "loyalty is restricted only to his caste. Virtue has become caste-ridden, and morality has become caste-bound... There is no charity to the needy. Suffering as such calls for no response."

## **10. Political Philosophy**

The relevance of political theories expounded by Plato and Aristotle (virtue and democracy), Augustine (heavenly and earthly cities), and Thomas Aquinas (Natural Law and Political community); Types of political systems; Theories of Social Contract (Hobbes, Locke and Rousseau); Taylor on Multiculturalism and Chomsky on Democracy; Arendt's critique of western political tradition; her critique of the Universal Declaration of Human Rights (UDHR) and her original insight on "the Right

to have Rights”, and Arendt’s emphasis on thinking as an antidote to totalitarian tendencies; The contradictory approaches of Gandhi and Ambedkar concerning social justice and caste discrimination in the context of the Round Table Conferences.

### 11. Subaltern Philosophy

The original Subaltern scholars critiqued traditional history writing and understanding of politics in India, and they sought to reinterpret (a) Indian history and (b) politics from ‘below.’ Often, the marginalisation is constituted by the creation of ‘silences’ and ‘absences’ in Indian history. One of the key features of subaltern studies consists of the investigation of the dynamics of elite domination and resistance by the marginalised: Tribal revolts in colonial context as examples of such resistance. There is evidence which suggests that often, the marginalised themselves tend to contribute to their own subjection.

### 12. Faith and Reason

Relation between faith and reason: strong rationalism, fideism, incompatibilism, critical rationalism and complementarity models; God of faith: Divine attributes; believing God without arguments: Religious belief as genuine option, as passionate inwardness, as basic belief, reformed epistemology; Religious pluralism and evaluation of religions by Richard Swinburne; Philosophical theology: Metaphysics of God and Creation, *fides quaerens intellectum*, *Credere est Assensione Cogitare, intellectus fidei, fides et ratio* of Aquinas, Incarnation, atonement, petitionary prayer; Encyclical Fides et Ratio: Relation between faith and reason, the interaction between Philosophy and Theology: requirements and dangers to avoid; Mary as the model: *Philosophari in Maria*.

### 13. Relevance of Philosophy

What is Philosophy? Why do we study Philosophy? What are the various features and characteristics of Philosophy? What are the questions raised by the branches of philosophy? How do philosophical studies involve familiarity with philosophers and philosophical ideas? How does it involve the capacity to think and reflect on important issues of society, politics, culture and other concrete areas of Philosophy? Why is Critical thinking an intrinsic part of philosophical reflections? What are the social effects of Philosophical reflections since Descartes? Why is Philosophical formation important for formation to the priesthood (faith formation).

#### Books for Study and Reference:

The Study and Reference materials of each course may be used.

#### Teaching and Learning Methods:

- Lecture, Group discussion, Debate, Preparing of questions

### Course Outcomes (COs)

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Comprehend and integrate philosophical concepts from holistic perspective.	K5
CO2	Evaluate assumptions and fundamental principles knowledge and reality.	K5
CO3	Apply analytical and critical skills in resolving the issues related to multiple belief systems.	K5
CO4	Apply and appreciate the concepts and strategies in the personal and social context.	K5
CO5	Form personal conviction and social commitment.	K5

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

### Mapping COs with POs and PSOs:

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	2	2	1	2	2	-	-	3	3	2	3	3	26
CO2	3	2	2	1	2	2	-	-	3	3	2	2	2	24
CO3	3	2	3	1	2	2	-	-	3	3	3	2	3	27
CO4	3	2	3	2	2	2	-	-	3	3	3	3	3	29
CO5	3	2	3	3	2	2	-	-	3	3	3	3	3	30
Grand Total of Cos with POs & PSOs													136	
Mean value of COs With PSOs & POs = 136/55													2.33	

1: Low 2: Medium 3: High “-”: no correlation

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.33
Observation	COs of Comprehensive Understanding of Philosophy (Written and Viva) are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR – 625 514

DEPARTMENT OF PHILOSOPHY

Class : B.A. Philosophy

Part : SBE - 2a

Semester : V

Hours : 45

Course Code : 22UPHI26 (a)

Credits : 02

APPLIED AESTHETICS

(For those who joined in June 2022 onwards)

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**Course Objectives**

The course appreciates the value and centrality of aesthetics in life. It enables the students to become acquainted with different aesthetic theories and concepts both in Western and Eastern philosophy. More specifically, it prepares students to relate and apply aesthetic theories in everyday life, especially in Architecture, in information and media fields, and in his/her relationship with nature.

**COURSE CONTENT:**

**Unit I: Western Aesthetics**

**9 hours**

(A) Definition, Nature and Scope of Aesthetics - Aesthetic object - Aesthetic judgment - Aesthetic art, expression, and experience; (B) Ancient Period: Pre-Socratic Greek Classics – Socrates – Plato – Aristotle – Plotinus; (C) Medieval Period: Augustine – Aquinas; (D) Modern and Postmodern Period: Edmund Burke – Theodore Adorno

**Unit II: Indian aesthetics**

**9 hours**

(A) Bharata: *Natyasastra and Rasa*; (B) Abinavagupta: Nava rasas – Dhvani theory

**Unit III: Environmental Aesthetics**

**9 hours**

Development – Scope – Art in Nature and Art from Nature – Nature Appreciation – Different Approaches to Environmental Aesthetics (Engagement and Cognitive) – Central Philosophical Issue of Environmental Aesthetics

**Unit IV: Art and Architectural Aesthetics**

**9 hours**

Key Elements in Art and Architectural Aesthetics – Aesthetics in Religious Architectures

**Unit V: Information and Media Aesthetics**

**9 hours**

(A) Information Aesthetics: Website Design Aesthetics – Software Aesthetics – Classical-Expressive Aesthetics – Aesthetics and Cartography; (B) Media Aesthetics: Aesthetics in Visual art – Film, Television and Video – Aesthetics in Painting

**Books for Study:**

1. Anand, A. (2000). *Introduction to aesthetics*. Satya Nilayam.
2. Barlingay, S. S. (2007). *A modern introduction to Indian aesthetic theory: The development from Bharata to Jagainatha*. D. K. Print world.
3. Carlson, A. (1999). *Aesthetics and the environment: The appreciation of nature, art and architecture*. Routledge.

4. Gonzalez, V. (2001). *Beauty and Islam: Aesthetics in Islamic art and architecture*. I. B. Tauris Publishers.
5. Sangeet, S. (2005). *Architectural aesthetics*. Abhishek Publications.
6. Winters, E. (2007). *Aesthetics and architecture*. Continuum.
7. Zettl, H. (2007). *Sight, sound, motion: Applied media aesthetics*. Wadsworth Publishing.

**Books for Reference:**

1. Ananda, C. (1999). *The Dance of Shiva: Fourteen Indian Essays*. Munshiram.
2. Busbea, L. (2020). *The responsive environment: design, aesthetics, and humanity in the 1970s*. University of Minnesota Press.
3. Ranjan, K. G. (2006). *Great Indian thinkers on art: Creativity, aesthetic communication and freedom*. Black & White.
4. Shyamala Gupta, S. (1999). *Art, beauty and creativity: Indian and Western aesthetics*. D. K. Print world.

**Website Links for Study:**

1. Aesthetic Components of Architecture. URL = <https://www.architecture-student.com/architecture/aesthetic-components-of-architecture/>
2. Allen, C. Environmental aesthetics. URL = <https://www.rep.routledge.com/articles/thematic/environmental-aesthetics/v-1/sections/what-is-environmental-aesthetics>
3. Binders, A. (2022). Website Aesthetics: Top 11 Trends in 2024. URL = <https://www.nexcess.net/blog/website-aesthetics/>
4. Munro, T., and Scruton, R. (2023). Aesthetics. Britannica. URL = <https://www.britannica.com/topic/aesthetics>
5. Perkins, C., Dodge, M., and Kitchin, R. (2022). Introductory Essay: Cartographic Aesthetics and Map Design. URL = <https://kitchin.org/wp-content/uploads/2019/04/map-reader-cart-aest-map-2011.pdf>
6. Liv, H. (Ed.). (2013). Thinking Media Aesthetics. URL = <http://library.oapen.org/handle/20.500.12657/25882>

**Teaching and Learning Methods:**

ICT enabled lecture method, Assignment, Class presentation, Group Discussion, and Field Exposure.

**Course Outcomes (COs):**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Analyse and evaluate the Western aesthetic traditions as they are reflected in art, religion, and social reformation.	K5
CO2	Apply Bharata's natya and Abinavagupta's Dhvani tactics in the presentation of artful things.	K3
CO3	Appreciate aesthetic nature and preserve it with all its natural resources uncontaminated.	K5

<b>CO4</b>	Value the architectural heritage and invent new meaningful architectures in the future.	<b>K6</b>
<b>CO5</b>	Upgrade him/herself to cope with upcoming digital era.	<b>K6</b>

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
<b>CO1</b>	3	2	2	1	-	-	-	-	3	3	2	1	2	19
<b>CO2</b>	3	2	2	1	-	-	-	-	3	3	2	2	2	20
<b>CO3</b>	3	1	2	2	2	2	2	2	3	2	2	2	3	28
<b>CO4</b>	3	1	2	2	2	2	2	-	3	3	3	2	3	28
<b>CO5</b>	3	2	2	2	2	3	2	-	3	3	2	2	3	29
Grand Total of Cos with POs & PSOs													124	
Mean value of COs with PSOs & POs = 124/55													2.25	

1: Low    2: Medium    3: High    "-": no correlation

Mapping Scale	1	2	3
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>2.25</b>
<b>Observation</b>	<b>COs of Applied Aesthetics are strongly correlated with POs &amp; PSOs</b>		

Class : B.A. Philosophy

Part : SLC

Semester : VI

Credits: 03

Course Code : 22UPHSL6

**NATURAL THEOLOGY: CONTEMPORARY PERSPECTIVES**

(For those who joined in June 2022 onwards)

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ii

**Course Objective:**

The course revisits the traditional classical arguments for the existence of God and his attributes. It explores new perspectives in the understanding of the concept of God. It analyses critically the argument of sufficient reason, design argument, phenomenological and ontological rejection of God and its defence, and at last some recent discussion of the problem of suffering and evil.

**Unit I: New Perspectives in the Understanding the Concept of God**

Alfred North Whitehead: Essential vs. Consequential Nature of God – Ecological and Feminist Perspectives in the Conception of God – Historical Understanding of God

**Unit II: Principle of Sufficient Reason and Russell-Copleston Debate**

**Unit III: Design Argument, David Hume's Rejection and Swinburn's Defence of it**

**Unit IV: Phenomenological Rejection versus Ontological Rejection of God's Existence in the Thinking of Nietzsche and Responses**

**Unit V: Neo-Understanding of Evil**

Response to the Problems of Suffering and Evil by Richard Swinburne, John Hick and Alvin Plantinga

'Radical Evil' of Kant and 'Banality of Evil' of Hannah Arendt in the Context of Eichmann Trial

Relation between "Thoughtlessness" and Evil in the World as Interpreted by Hannah Arendt in the Context of Totalitarianism

**Books for Study:**

1. Calloway, K. (2014). *Natural theology in the scientific revolution: God's scientists*. Routledge.
2. Colin, R. C., & Horban, P. (Eds). (2021). *Contemporary arguments in natural theology: God and rational belief*. Bloomsbury Academic.
3. Joseph, W. T. (2009). *Wisdom in the face of modernity: A study in Thomistic natural theology*. Sapientia Press.
4. Peterfreund, S. (2012). *Turning points in natural theology from Bacon to Darwin: The way of the argument from design*. Palgrave Macmillan.
5. Stump, E. (1985). "The problem of evil." *Faith and Philosophy: Journal of the Society of Christian Philosophers*, 2(4), Article 5.
6. Wahlberg, M. (2012). *Reshaping natural theology: Seeing nature as creation*. Palgrave Macmillan.

### Website Links for Study:

1. Assy, B. Eichmann, the banality of evil, and thinking in Arendt's thought. URL = <https://www.bu.edu/wcp/Papers/Cont/ContAssy.htm>
2. Dresser, S. What did Hannah Arendt really mean by the banality of evil? URL = <https://aeon.co/ideas/what-did-hannah-arendt-really-mean-by-the-banality-of-evil>
3. John Hick, "Allowing for Evil". URL = <https://philosophy.lander.edu/intro/hick.shtml>
4. Hanson, E. M. Immanuel Kant: Radical evil. Internet Encyclopaedia of Philosophy. URL = <https://iep.utm.edu/rad-evil/>
5. Naturalness of the natural theology: A psychological approach. URL = <https://ianramseycentre.ox.ac.uk/article/petrovich-the-naturalness-of-natural-theology-a-psychological-approach>
6. Speaks, J. (2006). Swinburne's response to the problem of evil. URL = <https://www3.nd.edu/~jspeaks/courses/mcgill/201/swinburne.pdf>

### Course Outcomes (COs):

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
<b>CO1</b>	Have a verified and critical understanding of God which is very relevant and beneficial to our contemporary world.	<b>K5</b>
<b>CO2</b>	Get a clear-cut clarification on the proof of the sufficient reason for the existence of God.	<b>K4</b>
<b>CO3</b>	Appreciate the orderly world and benevolent designer who is God and the aesthetics of the world.	<b>K5</b>
<b>CO4</b>	Clarify the distinction between the phenomenological and the ontological rejection of the existence of God.	<b>K4</b>
<b>CO5</b>	Have a positive approach to the problem of evil.	<b>K6</b>

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

### Mapping COs with POs and PSOs:

Mapping	PO								PSO					Sum of COs POs & PSO
	1	2	3	4	5	6	7	8	1	2	3	4	5	
<b>CO1</b>	3	3	3	2	2	-	2	1	3	2	2	1	2	26
<b>CO2</b>	2	2	2	1	1	-	2	-	3	3	3	3	2	24
<b>CO3</b>	3	2	2	1	1	-	2	-	3	3	3	2	2	24
<b>CO4</b>	2	2	2	1	1	-	2	-	3	3	3	2	2	23
<b>CO5</b>	3	3	3	2	2	-	2	1	3	3	3	3	2	30
Grand Total of Cos with POs & PSOs													127	
Mean value of COs With PSOs & POs = 127/57													2.22	

1: Slight (Low)    2: Moderate (Medium)    3: Substantial (High)    "-": no correlation

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>2.22</b>
<b>Observation</b>	<b>COs of Natural Theology: Contemporary Perspectives are strongly correlated with POs &amp;PSOs</b>		

VALUE ADDED COURSES

Semester : ODD

Hours : 30

Course Code : 23VPHO1

BASICS OF LATIN

(For those who joined in June 2023 onwards)

**Course Objectives:**

To teach elementary Latin for effective learning of Western Philosophy and Culture and appreciate the etymological fundamentals and history of European languages.

**COURSE CONTENT:**

**Unit I: Alphabet** **8 hours**

Vowels, Consonants, Sounds, Syllables

**Unit II: Sentence** **8 hours**

Noun, Pronoun, Gender, Number, Verbs

**Unit III: Cases** **6 hours**

Nominative, Vocative, Genitive, Dative, Accusative, and Ablative Cases

**Unit IV: Conversation and Translation** **4 hours**

Lessons and Exercises in the text book

**Unit V: Glossary of Philosophical Terms** **4 hours**

Multiple Philosophical terms and their etymological roots and their historical developments

**Book for Study:**

1. J. Van Bogaert. S. J. 1992. Latin Exercises (Part-1). The Catholic Press. Ranchi. India.
2. J. Van Bogaert. S. J. 2013. Latin Grammar. Satya Bharati Ranchi. Ranchi. India.
3. J. W. Bartram. 1931. Longman's Latin Course. Longman's Green and Co. Ltd. London. UK.

**Reference:**

<https://www.youtube.com/@EasyLatin>

**Teaching and Learning Methods:**

- Lecturing, ICT & Video clips, Reading and writing practice, Class presentation

**Course Outcomes (COs):**

<i>At the end of the course, students will be able to</i>	<b>Knowledge Level up to</b>
Read, write and speak simple sentences in Latin	<b>K2</b>
Understand basic grammar	<b>K2</b>
Translate simple Latin sentences	<b>K3</b>
Understand terms used in Western Philosophy	<b>K2</b>
Appreciate the etymological aspects of Latin	<b>K3</b>

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of Cos with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	Max. of 39
CO1	2	2	-	-	-	-	-	-	1	-	1	-	-	6
CO2	2	2	-	-	-	-	-	-	1	-	1	-	-	6
CO3	2	2	-	-	-	-	-	-	1	-	1	-	-	6
CO4	2	2	-	-	-	-	-	-	1	-	1	-	-	6
CO5	2	2	-	1	-	-	-	-	2	-	-	-	2	9
Grand Total of Cos with POs & PSOs												33		
Mean value of COs With PSOs & POs = 33/26												1.27		

1: Low                                      2: Medium                                      3: High                                      “-”: no correlation

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			<b>1.27</b>
Observation	<b>COs of Basics of Latin are medium level correlated with POs &amp; PSOs</b>		

**THEODICY**

(For those who joined in June 2023 onwards)

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**Course Objectives:**

The course on 'Theodicy' introduces the traditional philosophy of God to the students along with its challenges and other problems. Arguments proposed by the course are aiming at proving the nature, purpose, and necessity of an eternal and creator God. Dealing with some of the problems that the students may encounter in their faith, the course seeks to strengthen the faith of the students.

**COURSE CONTENT:**

**Unit I: Introduction**

Definition of God and Theodicy

Different conceptions of God: Theism and its various Types, Monotheism, Dualism, polytheism, Deism, Monism, Pantheism, Panentheism, and Autotheism

**Unit II: Nature and Attributes of God**

God as Creator, Infinite, Omnipotent, Omniscient, Omnibenevolent, Simple, and Necessary Being

**Unit III: Traditional Arguments for the Existence of God**

Augustine on the Existence of God – Ontological Argument – Cosmological Arguments (Aquinas) – Teleological Arguments – Moral Arguments – Argument from Religious Experience

**Unit IV: Modern Arguments for the Existence of God**

Rationalism: Descartes, Spinoza, and Leibniz

Empiricism: Locke, Berkeley, and Hume

Idealism: Kant and Hegel

**Unit V: Challenges in Theodicy**

The Existence of Suffering and Evil

Problem of Atheism and Agnosticism: Definitions of Atheism and Agnosticism -

Forms of Atheism and Agnosticism - Arguments for Atheism and Agnosticism -

Arguments against Atheism and Agnosticism - Towards Affirming the Existence of God

**Book for Study:**

1. Castelo, Daniel. (2012). *Theological Theodicy*. Wipf & Stock Publishers.

**Teaching and Learning Methods:**

- Lecturing, ICT & Video clips, Reading and writing practice, Class presentation

**Course Outcomes (COs):**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Be familiarized with the knowledge about the different traditional conceptions of God	K2
CO2	Understand and analyze the different attributes of God and be able to avoid conflicts regarding the understanding of God	K4
CO3	Rationalize the belief and become matured worshiper of God	K5
CO4	Approach the problems of the philosophy of God from different perspectives which were prevalent in the Modern period	K3
CO5	Develop a strong faith in God amidst challenges and problems	K6

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of Cos with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	Max. of 39
<b>CO1</b>	3	2	-	1	-	2	-	1	3	2	-	1	-	15
<b>CO2</b>	2	2	1	2	3	2	1	2	1	3	1	2	2	24
<b>CO3</b>	1	3	2	2	2	2	2	1	1	3	2	3	2	26
<b>CO4</b>	-	2	2	3	3	2	2	3	-	2	2	3	3	27
<b>CO5</b>	2	2	3	1	1	1	1	3	2	2	3	1	1	23
Grand Total of Cos with POs & PSOs													115	
Mean value of COs With PSOs & POs = 115/58													1.98	

1: Low

2: Medium

3: High

"-": no correlation

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			<b>1.98</b>
Observation	<b>COs of Theodicy are medium level correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF PHILOSOPHY**

Semester : EVEN

Hours : 30

Course Code : 23VPHE1

**SYMBOLIC LOGIC**

(For those who joined in June 2023 onwards)

**Course Objectives:**

The course on ‘Symbolic Logic’ is to help the students to learn and symbolize the propositions and construct the arguments with symbols.

**COURSE CONTENT:**

**Unit I: Introduction to Symbols**

**10 hours**

Nature and Scope of Symbolic Logic – Difference between Symbolic Logic and traditional Logic – Classification of Propositions – Logical Connectives and Constants – Symbolization of Propositions

**Unit II: Truth Table Technique**

**10 hours**

Construct of Truth Table for Variables – Basic Truth Tables for Propositions – Direct Truth Table: Logical Propositions as Tautologies, Contradictory and Contingent – Indirect Truth Table: Logical Propositions as Tautology and Non-Tautology

**Unit III: Formal Proof of Validity**

**10 hours**

Rules of Inference – Construction of Formal Proof – Rules of Equivalence

**Reference:**

1. Balasubramanian, P. (1980). *Symbolic logic*. University of Madras.
2. Copi, I. M. (2015). *Symbolic logic*. Pearson Education India.

**Teaching and Learning Methods:**

- Lecturing, ICT & Video clips, Reading and writing practice, Class presentation

**Course Outcomes (COs):**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	apply and use the symbols in reasoning	K3
CO2	Construct arguments with symbols	K5
CO3	Verify the validity of an arguments	K6

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyse, K5 = Evaluate, and K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of Cos with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	Max. of 39
CO1	3	-	-	1	1	3	1	-	1	-	1	-	-	11
CO2	3	-	-	2	3	3	1	-	1	-	1	-	-	14
CO3	3	-	-	3	2	3	2	-	1	-	1	-	-	15
Grand Total of Cos with POs & PSOs													40	
Mean value of COs with PSOs & POs = 40/21													1.90	

1: Low

2: Medium

3: High

“-”: no correlation

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>1.90</b>
<b>Observation</b>	<b>COs of Symbolic Logic are medium level correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF PHILOSOPHY**

Semester : EVEN

Hours : 30

Course Code : 23VPHE1

**TEXTUAL STUDY: SUMMA CONTRA GENTILES**

(For those who joined in June 2023 onwards)

**Course Objectives:**

The course introduces students on the methods of reading a philosophical classic. It helps them to study the didactic approach and philosophy of St. Thomas Aquinas.

**Course Content:**

**UNIT I:** Methodology of Textual Study 10 Hours

**UNIT II:** General Introduction to the Author, Context and the Text 10 Hours

**UNIT III:** Textual Analysis of the Book One of the 10 Hours

“Summa Contra Gentiles” (Selected Chapters), Their interpretation in the present context.

**Book for Study:**

1. Aquinas, T. (1955). *Summa Contra Gentiles*. Bk I. Image Books.

**Teaching and Learning Methods:**

ICT enabled lecture method, Assignment, Class presentation, and Group Discussion.

**Course Outcomes (COs):**

CO No.	<i>At the end of the course, students will be able to</i>	Knowledge Level up to
CO1	Apply methodology of textual analysis.	K3
CO2	Interpret the original text from perspectives of author and his context.	K5
CO3	Interpret the text in the context of reader.	K5
CO4	Evaluate his arguments from philosophical perspectives.	K5
CO5	Decipher theological implications.	K5

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

**Mapping COs with POs and PSOs:**

Mapping	PO								PSO					Sum of COs with POs & PSOs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	2	2	-	-	3	3	2	-	-	-	3	-	3	18
CO2	2	2	-	-	2	-	2	-	-	-	3	-	2	13
CO3	2	1	-	3	2	-	2	-	-	3	3	-	2	18
CO4	3	3	-	-	2	-	-	-	3	3	-	-	2	16
CO5	1	2	-	-	2	-	-	-	3	3	-	-	1	14
Grand Total of Cos with POs & PSOs													79	
Mean value of COs with PSOs & POs = 79/33													2.39	

1: Low

2: Medium

3: High

“-”: no correlation

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>2.39</b>
<b>Observation</b>	<b>COs of Textual Study: Summa Contra Gentiles are strongly correlated with POs &amp;PSOs</b>		



**DEPARTMENT OF MATHEMATICS**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF MATHEMATICS**  
**B.Sc. MATHEMATICS**  
**CBCS - OBE PATTERN (From 2022 – 2023 onwards)**

<b>I SEMESTER</b>				
<b>PART</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Hrs</b>	<b>Cr</b>
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil / Hindi / French	06	04
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream A English through Prose & Short Story – Stream B	05	04
III	22UMAC11	Core – 1 Algebra and Trigonometry	06	05
	22UMAC21	Core – 2 Mathematical Statistics – I	06	05
	22UPYB11/ 22UCHB11	Allied – 1 Allied Physics / Chemistry	03	03
	22UPYR12/ 22UCHR12	Allied Physics / Chemistry Lab	02	-
	22UMAB11	Allied – 1 Allied Mathematics – I (for Phy/Che)		
IV	22UFCE11	FC - Personality Development	01	01
V	22UCSH12	Communication Skills	01	-
	22UNCC/NSS/ PHY.EDU./ YRC/ ROT/ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn / YRC / ROTARACT / AICUF / Nature Club	-	-
	22UBRC11	Bridge Course		01
		<b>TOTAL</b>	<b>30</b>	<b>23</b>
<b>II SEMESTER</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil / Hindi / French	06	04
II	22UENA22 22UENB22	English through Prose & Poetry – Stream A English through Prose & Poetry – Stream B	05	04
III	22UMAC32	Core – 3 Calculus	06	05
	22UMAC42	Core – 4 Mathematical Statistics – II	06	05
	22UPYB22/ 22UCHB22	Allied – 2 Allied Physics / Chemistry	03	03
	22UPYR12/ 22UCHR12	Allied Physics / Chemistry Lab	02	02
	22UMAB22	Allied – 2 Allied Mathematics–II (for Phy & Che)		
IV	22UFCH22	FC - Social Analysis and Human Rights	01	01
V	22UCSH12	Communication Skills	01	01
	22UNCC/NSS/ PHY.EDU./ YRC/ ROT/ACF/	Extension Activities NSS / NCC / Phy.Edn. / YRC/ ROTARACT / AICUF / Nature Club		01
		<b>TOTAL</b>	<b>30</b>	<b>26</b>

III SEMESTER				
I	22UTAL33/ 22UHNL33/ 22UFNL33	Tamil / Hindi / French	06	04
II	22UENG33	English Through Literature I	06	04
III	22UMAC53	Core – 5 Sequences and Series	06	05
	22UMAA33	Allied – 3 Analytical Geometry of 3D & Vector Calculus	05	04
IV	22UMAN13	NME – 1 Mathematics for Competitive Examinations (for Arts)	03	02
	22USB13	SBE – 1 Fundamentals of Computer, Internet and Office Automation	01	01
	22USBP13	SBE – 1 Fundamentals of Computer, Internet and Office Automation - Practical	02	01
	22UFCE33	FC – Environmental Studies	01	01
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB24	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	...	
	22UARE14	ARISE	-	-
		<b>TOTAL</b>	<b>30</b>	<b>22</b>
IV SEMESTER				
I	22UTAL44/ 22UHNL44/ 22UFNL44	Tamil / Hindi / French	06	04
II	22UENG44	English Through Literature II	06	04
III	22UMAC64	Core – 6 Mechanics	06	05
	22UMAA44	Allied – 4 Differential Equations and Applications	05	04
IV	22UMAN24	NME – 2 Resource Optimization Techniques (for Science)	03	02
	22USB24	SBE – 2 Programming in C	01	01
	22USBP24	SBE – 2 Programming in C Practical	02	01
	22UFCH44	FC – Bioethics, Religions and Peace Studies Catechism of the Catholic Church	01	01
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB24	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club		01
	22UARE14	ARISE		01
		<b>TOTAL</b>	<b>30</b>	<b>24</b>

V SEMESTER				
III	22UMAC75	Core – 7 Modern Algebra	06	05
	22UMAC85	Core – 8 Real Analysis	06	05
	22UMAC95	Core – 9 Numerical Methods using Computer Applications	04	04
	22UMAP15	Core Lab Numerical Methods using C++ Lab	02	01
	22UMAD05	Core – 10 Operations Research	06	05
	22UMAE15	Core Elective -1 Number Theory / Elements of Topology	04	03
V	22UINT15	Internship	-	01
	22USSI16	Soft Skills – I	02	01
		<b>TOTAL</b>	<b>30</b>	<b>25</b>
VI SEMESTER				
III	22UMAD16	Core – 11 Linear Algebra	06	05
	22UMAD26	Core – 12 Complex Analysis	06	05
	22UMAD36	Core – 13 Graph Theory	06	05
	22UMAD46	Core – 14 Industrial Optimization Techniques	06	05
	22UMAE26	Core Elective – 2 Java Programming / R Programming	02	02
	22UMAJ16	Core Elective Lab Java Programming Lab / R Programming Lab	02	01
V	22USSI16	Soft Skills – II	02	01
		<b>TOTAL</b>	<b>30</b>	<b>24</b>

Semester	I	II	III	IV	V	VI	Total
Credits	23	26	22	24	25	24	<b>144</b>

Part I **16 credits**

Part II **16 credits**

Part III

Core 70

Allied 16

Core Electives 06

**Total 92 credits**

Part IV

Non-Major Electives 04

Skill based Electives 04

Foundation Courses 04

**Total 12 credits**

Part V

Extension Activities 02

ARISE 01

Bridge Course 01

Soft Skills 02

Communicative Skills	01
Internship	01
<b>Total</b>	<b>08 credits</b>

Credits	Part I	Part II	Part III	Part IV	Part V	Total
	16	16	92	12	08	<b>144</b>

### Self-Learning Courses

Semester	Course Code	Course Title	Credits
III	22UMASL3	Solar System	03
IV	22UMASL4	Stellar Universe	03
V	22UMASL5	Statistical Methods in Social Sciences	03
VI	22UMASL6	Mathematical Methods in Business	03

### Value Added Courses (Certificate Course - 30 hours)

#### UG

Introduction to SPSS  
 Data Analysis using SPSS  
 Graphing & Computations using Geogebra  
 Forensic Mathematics

#### PG

Data Analysis using R  
 Introduction to LaTeX

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514  
DEPARTMENT OF MATHEMATICS

Modern Algebra

(For those who join from June 2022 onwards)

Class : III B.Sc. Mathematics

Part : III/Core 7

Semester : V

Hours : 90

Course Code : 22UMAC75

Credits: 5

**Objective:**

This course enables the students to gain profound knowledge on the various characteristics of Groups and Rings.

**Unit 1 Group Theory**

Groups- definition and examples – Abelian groups – permutation groups – subgroups- cyclic groups – definitions – intersection and union of two groups – order of a group and order of an element. **(18 hours)**

**Unit 2 Cosets**

Cosets and Lagrange's theorem – theorems of Euler and Fermat – normal subgroups – center of a group – quotient groups – Cayley's theorem – homomorphism – fundamental theorem. **(18 hours)**

**Unit 3 Ring Theory**

Rings – definition and examples – types of rings – zero divisors – integral domain – field – finite integral domain – characteristic of a ring. **(18 hours)**

**Unit 4 Sub Rings**

Sub rings- definition and examples – ideals – principal ideal – principal ideal domain – quotient rings – maximal and prime ideals. **(18 hours)**

**Unit 5 Unique factorization domain**

Homomorphism of rings – fundamental theorem – unique factorization domain- Euclidean domain- Every PID is unique factorization domain. **(18 hours)**

**Book for Study**

Arumugam S., Thangapandi Issac A., *Modern Algebra*, SCITECH Publications (India) Pvt Ltd., Chennai, 2018.

Unit 1 : Chapter 3	Sections: 3.0 - 3.7
Unit 2 : Chapter 3	Sections: 3.8 - 3.11
Unit 3 : Chapter 4	Sections: 4.1 - 4.5
Unit 4 : Chapter 4	Sections: 4.6 - 4.9
Unit 5 : Chapter 4	Sections: 4.10, 4.13 - 4.15

**Books for Reference:**

1. Surjeet Singh, Qazi Zameerudin, *Modern Algebra*, Vikas Publishing House Private Limited, New Delhi, 2012.
2. Vasishtha A.R., *Modern Algebra*, Krishna Prakasham Mandir, Meerut, 2013.

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Describe the concept of group and its properties	K2
CO2	Explain the concept of cosets, normal subgroups, homomorphism and illustrate the implication of Lagrange's theorem	K3
CO3	Examine the characteristics of ring and compare its types	K4
CO4	Make inferences of the relationship between various kinds of ideals	K4
CO5	Analyze the properties of integral domain and unique factorization domain	K4

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

**Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2	2	2		3	3	2	2	2	24
CO2	3	3			2	2	2		3	2	2	2	2	23
CO3	3	3			2	2	2		3	3	2	2	2	24
CO4	3	3			2	2	2		3	2	2	2	2	23
CO5	3	3			2	2	2		3	3	2	2	2	24
Grand Total of COs with POs & PSOs														118
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{118}{50}$														2.4

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.4
Observation	COs of Modern Algebra are strongly correlated with POs & PSOs		

DEPARTMENT OF MATHEMATICS

Real Analysis

(For those who join from June 2022 onwards)

Class : III B.Sc. Mathematics

Semester : V

Course Code : 22UMAC85

Part : III/ Core 8

Hours : 90

Credits: 5

**Objective :**

This course makes the learners to acquire comprehensive understanding of the metric properties of the real line

**Course Outline:**

- Unit 1            Metric Spaces & Open sets**  
Definition and examples of metric spaces – bounded sets – open ball – open sets – equivalent metrics – subspaces  
**(18 hours)**
- Unit 2            Interior of a set & Closed sets**  
Interior of a set – closed sets – closed ball – examples – closure – limit points – derived set – dense sets  
**(18 hours)**
- Unit 3            Completeness**  
Definition and examples – Cantor’s intersection theorem – Baire’s category theorem  
**(18 hours)**
- Unit 4            Continuity**  
Homeomorphisms – Connectedness- Connected subsets of  $\mathbb{R}$  - Compactness – compact subsets of  $\mathbb{R}$  – Heine-Borel theorem  
**(18 hours)**
- Unit 5            L’Hospital’s Theorem**  
The indeterminate form  $(0/0)$  – L’Hospital’s Theorem – The indeterminate form  $(\infty/\infty)$  – Application of L’Hospital’s rule for  $\infty/\infty$  form - The indeterminate form  $0 \times \infty$  - The indeterminate form  $\infty - \infty$  - The indeterminate forms  $0^0$ ,  $\infty^0$  and  $1^\infty$   
**(18 hours)**

**Books for Study**

1. Arumugam S., Thangapandi Issac A., *Modern Analysis*, New Gamma Publishing House, Palayamkottai, 2019.  
Unit 1 : Chapter 2        Sections: 2.1 – 2.6  
Unit 2 : Chapter 2        Sections: 2.7 – 2.11  
Unit 3 : Chapter 3        Sections: 3.1 – 3.3  
Unit 4 : Chapter 4        Sections : 4.1 – 4.3  
                  Chapter 5        Sections : 5.1, 5.3  
                  Chapter 6        Sections : 6.1 – 6.3
2. Shanti Narayan & Dr.M.D.Raisinghania , *Elements of Real Analysis*, S.Chand & Company Pvt.Ltd.,New Delhi,2008.  
Unit 5        : Chapter 12

**Books for Reference:**

1. Viswanaha Naik.K., *Real Analysis*, Emerald Publishers, Chennai, 2013.
2. T.M.Apostal, *Mathematical Analysis*, Second Edition, Norosa Publishing House, New Delhi.
3. M. K. Singal & Asha Rani Singal, *A First Course in Real Analysis*, R. Chand & Co., 2008

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Describe the concept of metric spaces and open sets	K2
CO2	Examine the nature of open sets and closedsets	K4
CO3	Make inferences on completeness and its related theorems	K4
CO4	Analyze the properties of continuity and compactness	K4
CO5	Apply L'Hospital's Theorem to determine the value of the given indeterminate form	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

**Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2	2	2		3	2		2	3	22
CO2	3	3			2	2	2		3	2		3	3	23
CO3	3	3			2	2	2		3	2		2	3	22
CO4	3	3			2	2	2		3	2	3	2	2	24
CO5	3	3			2	2	2		3	2		2	3	22
Grand Total of Cos with POs & PSOs														113
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{113}{46}$														2.5

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.5
Observation	COs of Real Analysis are strongly correlated with POs & PSOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF MATHEMATICS**

**Numerical Methods using Computer Applications**

(For those who join from June 2022 onwards)

**Class : III B.Sc. Mathematics**

**Part : III/ Core 9**

**Semester : V**

**Hours : 60**

**Course Code : 22UMAC95**

**Credits: 4**

**Objective:**

This course facilitates the learners develop the skill of solving problems numerically with computer applications.

**Course Outline:**

**Unit 1: Algebraic and Transcendental equations**

Solution of Algebraic and Transcendental equations - Bisection method - Method of false position - Iteration method - Newton-Raphson method-Ramanujan's method - The Secant method **(12 hours)**

**Unit 2: Interpolation**

Interpolation – errors in polynomial interpolation – finite differences – Newton's formulae for interpolation – central difference interpolation formula - Lagrange's interpolation formula – error in Lagrange's interpolation formula **(12 hours)**

**Unit 3: Numerical differentiation and Integration**

Numerical differentiation – differentiation using Newton's formulae and Stirling's central difference formula – maxima and minima – numerical integration – Trapezoidal rule – Simpson's one - third and three - eight rules **(12 hours)**

**Unit 4: Object Oriented Programming**

Principles of object oriented Programming – introduction to C++ – tokens – keywords – identifiers and constants – data types – expressions and control structures **(12 hours)**

**Unit 5: Functions in C++**

Functions – function prototyping – call by reference – return by reference – function overloading **(12 hours)**

**Books for Study:**

1. Sastry, S.S., *Introductory Methods of Numerical Analysis*, Prentice Hall of India Private limited, New Delhi, 2019

Unit 1 : Chapter 2      Sections : 2.1-2.7

Unit 2 : Chapter 3      Sections : 3.1 – 3.4, 3.6, 3.7, 3.9.1, 3.9.2

Unit 3 : Chapter 5      Sections : 5.1 – 5.4

2. Balagurusamy E, *Object-Oriented Programming with C++*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2018.

Unit 4 : Chapters 1 & 3      Sections : 1.4 – 1.6, 3.1 – 3.25

Unit 5 : Chapter 4      Sections : 4.1 – 4.12

**Books for Reference:**

1. Dr.Venkataraman M.K., *Numerical Methods in Science and Engineering*, The National Publishing

Company, Chennai, 2013.

2. Veerarajan, T and Ramachandran, T, *Theory and problems in numerical methods with programs in C and C++*, Tata McGraw Hill Publishing Company Limited, New Delhi, 2004

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Solve Algebraic and Transcendental equations using different methods	K3
CO2	Apply the difference operators and the use of interpolation	K3
CO3	Use various methods to find the derivative of mathematical function	K3
CO4	Apply the characteristics of object oriented programming languages	K3
CO5	Write programs using function prototyping and function overloading	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

**Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3		2	2	3	2		3	2	3	2	2	27
CO2	3	3		2	2	3	2		3	2	3	2	2	27
CO3	3	3		2	2	3	2		3	2	3	2	2	27
CO4	3	3		2	2	3	2		3	2	3	2	2	27
CO5	3	3		2	2	3	2		3	2	3	2	2	27
Grand Total of Cos with POs & PSOs														135
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{135}{55}$														2.5

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.5
Observation	COs of Numerical Methods using Computer Applications are strongly correlated with POs & PSOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF MATHEMATICS**  
**Numerical Methods using C++ Lab**  
(For those who join from June 2022 onwards)

**Class** : III B.Sc. Mathematics  
**Semester** : V  
**Course Code** : 22UMAP15

**Part** : III /Core Lab  
**Hours** : 30  
**Credits** : 1

**Objective :**

This course intends to make the learners construct new programs using C++ to compute solutions to the numerical problems

**Course Outline:**

**List of Programs**

Write a C++ program

1. To solve an equation using bisection method.
2. To determine the roots of an equation using Newton – Raphson method.
3. To find the roots of an equation using secant method.
4. To find the missing data using the Newton’s forward interpolation formula.
5. To find the missing data using the Newton’s backward interpolation formula.
6. To interpolate y using the Lagrange’s method.
7. To find the derivative at initial point by Newton’s forward formula.
8. To determine the numerical values of the derivative of a function at an initial point by Newton’s backward formula.
9. To determine the maxima and minima of a function.
10. To find numerical solutions to definite integrals.

**Books for Study:**

1. Sastry, S.S., *Introductory Methods of Numerical Analysis*, Prentice Hall of India Private limited, New Delhi, 2019
2. Balagurusamy E, *Object-Oriented Programming with C++*, Tata McGraw Hill Publishing Company Limited, New Delhi, 2018.

**Books for Reference:**

1. Dr. Venkataraman M.K., *Numerical Methods in Science and Engineering*, The National Publishing Company, Chennai, 2013.
2. Veerarajan, T and Ramachandran, T, *Theory and problems in numerical methods with programs in C and C++*, Tata McGraw Hill Publishing Company Limited, New Delhi, 2004.

**Teaching Learning Methods:**

Lecture Method, ICT, Hands-on -session

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Apply the underlying concepts of object oriented programming to compute solutions to algebraic and transcendental equations	K3
CO2	Use function prototyping and function overloading to find solutions based on interpolation methods	K3
CO3	Write programs for finding the numerical values of the derivative of a function	K3
CO4	Construct programs determine the maxima and minima of a function	K3
CO5	Develop programs to find numerical solutions to definite integrals	K3

**K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create**

**Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2	2	2	2	2		3			19
CO2	3	3			2	2	2	2	2		3			19
CO3	3	3			2	2	2	2	2		3			19
CO4	3	3			2	2	2	2	2		3			19
CO5	3	3			2	2	2	2	2		3			19
Grand Total of Cos with POs & PSOs														95
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{95}{40}$														2.4

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.4
Observation	COs of Numerical Methods using C++ Lab are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR

DEPARTMENT OF MATHEMATICS

Operations Research

(For those who join from June 2022 onwards)

Class	: B.Sc. Mathematics	Part	: III/Core-10
Semester	: V	Hours	: 90
Course Code	: 22UMAD05	Credits	: 5

**Objective**

This course aids the learners to gain knowledge on applying optimization techniques to solve the problems.

**Course Outline:**

**Unit 1 Introduction to Operations Research**

Over view of operations research – definition of L.P.P – mathematical formulation – graphical solution – general linear programming problems – canonical and standard forms – simplex method – properties of solutions **(18 hours)**

**Unit 2 Methods of Solving LPP**

Artificial variables – Big-M method- algorithm of Penalty method – two-phasesimplex method and its algorithm – degeneracy and cycling of a linear programming problem – duality in linear programming **(18 hours)**

**Unit 3 Game Theory**

Game and strategies – two-person zero sum games – maximin and minimax principle– games without saddle points – mixed strategies – graphical solution – dominance property – solution using L.P.P **(18 hours)**

**Unit 4 Sequencing & Replacement**

Sequencing problems – problems with n jobs and two machines – n jobs with three machines – replacement problems in manufacturing sectors **(18 hours)**

**Unit 5 Networking**

Network diagram representation – critical path method – time charts and resource levelling – Project Evaluation and Review Technique (PERT) **(18 hours)**

**Book for Study**

Kanthi Swarup, Gupta P.K., Man Mohan, *Operations Research*, Sultan Chand Sons, Educational Publishers, New Delhi, 2019.

Unit 1:	Chapter 1	Sections	1.1-1.11
	Chapter 2	Sections	2.1-2.4
	Chapter 3	Sections	3.1-3.5
Unit 2:	Chapter 4	Sections	4.1-4.5
	Chapter 5	Sections	5.1-5.4,5.7
Unit 3:	Chapter 17	Sections	17.1-17.7,17.9
Unit 4:	Chapter 12	Sections	12.1-12.4
	Chapter 18	Sections	18.1-18.3
Unit 5 :	Chapter 25	Sections	25.1-25.7

**Books for Reference:**

1. Kalavathy S., *Operations Research*, Vikas Publishing House Private Limited, New Delhi, 2019.
2. Panner Selvam R., *Operations Research*, Prentice Hall of India Private Limited, New Delhi, 2019.

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Summarize the concepts of linear programming and apply graphical and simplex method to find the optimal solutions to LPP	K3
CO2	Employ the suitable methods of solving linear programming Problems	K3
CO3	Apply various techniques of game to find optimal strategies	K3
CO4	Solve the problems of replacements and sequencing	K3
CO5	Make use of algorithms to find the best solution to the Network problems	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

**Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3		3	2	3	2		3	2	3	2	2	28
CO2	3	3		2	2	3	2		3	3	3	2	2	28
CO3	3	3		2	2	3	2		3	2	3	2	2	27
CO4	3	3		2	2	3	2		3	2	3	2	2	27
CO5	3	3		2	2	3	2		3	2	3	2	2	27
Grand Total of COs with POs & PSOs														137
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{137}{55}$														2.5

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.5
Observation	COs of Operations Research are strongly correlated with POs & PSOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF MATHEMATICS**  
**Number Theory**  
(For those who join from June 2022 onwards)

<b>Class</b>	<b>: III.B.Sc. Mathematics</b>	<b>Part</b>	<b>: III/ Core Elective-1</b>
<b>Semester</b>	<b>: V</b>	<b>Hours</b>	<b>: 60</b>
<b>Course Code</b>	<b>: 22UMAE15 (A)</b>	<b>Credits</b>	<b>: 3</b>

**Objective:**

This course facilitates the learners to comprehend the underlying concepts and applications of theory of numbers.

**Course Outline:**

**Unit 1: Natural numbers :**

Peano's axioms – principle of mathematical induction – addition and multiplication in natural numbers – order relation – Trichotomy law – principle of well ordering  
**(12 hours)**

**Unit 2: Integers :**

Addition and multiplication - positive and negative integers – Trichotomy law – absolute value  
**(12 hours)**

**Unit 3: Rational numbers :**

Addition and multiplication – Archimedean property – Trichotomy law – real numbers – axioms – subtraction – cancellation laws – Archimedean property  
**(12 hours)**

**Unit 4: Congruences :**

Congruences – Chinese remainder theorem – Euler's function – problems  
**(12 hours)**

**Unit 5: Theorems of Fermat and Euler :**

Fermat's theorem – Euler's theorem – Wilson's theorem – Lagrange's theorem – applications  
**(12 hours)**

**Books for Study:**

1. Aggarwal, R.S., *Text Book on Set Theory and Number System*, S.Chand and Company, New Delhi.

Unit 1: Chapter 1

Unit 2: Chapter 2

Unit 3: Chapter 3 and 4

2. Arumugam, S. and Issac, *Set Theory, Number Systems and Theory of Equations*, New Gamma Publishing House, 1999.

Unit 4: Chapter 3 Sections: 3.1-3.4

Unit 5: Chapter 3 Section: 3.5

**Books for Reference:**

- 1.Kanna, M.L., *Number System*, 3<sup>rd</sup> Edition, Sri Prakashanath and Co Publishers, Meerut, 1981
- 2.Singal, M.K., Asha Rani, *Sets and Numbers*, II Edition, R.Chand and Co Publishers, New Delhi, 1976

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Illustrate Peano’s axioms and related principles	K2
CO2	Discuss Trichotomy law of integers	K2
CO3	Explain the implications of Archimedean property of rational and real numbers	K2
CO4	Solve problems based on congruences	K3
CO5	Apply theorems to find solutions to the problems	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

**Mapping Course outcome with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3	3	3	3				3	2	3	3	2	28
CO2	3	3	3	3	3				3	2	3	3	2	28
CO3	3	3	3	3	3				3	2	3	3	2	28
CO4	3	3	3	3	3				3	3	3	2	2	28
CO5	3	3	3	3	3				3	3	3	2	2	28
Grand Total of COs with POs & PSOs														140
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{120}{50}$														2.8

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.5
Observation	COs of Number Theory are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF MATHEMATICS

Elements of Topology

(For those who join from June 2022 onwards)

Class : III B.Sc. Mathematics

Semester : V

Course Code : 22UMAE15 (B)

Part : III/Core Elective-1

Hours : 60

Credits: 3

**Objective :**

This course enables the learners to gain profound knowledge on the fundamentals of Topology.

**Course Outline:**

**Unit 1: Elements of Set Theory :**

Relation and mappings – types of relations – equivalence classes – partitions – partial order relation – well ordered set – types of functions – inverse functions – composite functions  
**(12 hours)**

**Unit 2: Topological Spaces :**

Introduction to topology – definition and examples – various types of topology – intersection and union of topologies  
**(12 hours)**

**Unit 3: Basis for a topology :**

Characterization of topological spaces in terms of open and closed sets – basis for a topology  
**(12 hours)**

**Unit 4: Continuity :**

Continuity – criterion for continuous functions in terms of open and closed sets – open and closed mappings – homeomorphisms  
**(12 hours)**

**Unit 5: Connectedness :**

Connectedness – Separated sets – properties of separated sets – connected and disconnected sets  
**(12 hours)**

**Books for Study**

1. Arumugam S., Thangapandi Issac A., *Set Theory, Number Systems and Theory of Equations*, New Gamma Publishing House, Palayamkottai, 2000.

Unit 1 : Chapter 1 & Chapter 2

2. Kanna, M.L., *Topology*, Jai Prakashnath and Co., Meerut, 1998.

Unit 2 : Chapter 3 Sections 1 - 10

Unit 3 : Chapter 3 Sections 11 - 16

Unit 4 : Chapter 5 Sections 1, 2, 4

Unit 5 : Chapter 6 Sections 1-3

**Books for Reference:**

1. Shanthi Narayan, *General Topology*, S.Chand and Co, New Delhi, 1989
2. Chandrasekhra Rao, K, *General Topology*, S.Viswanathan, Chennai, 1986

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Comprehend the concepts of relation and mappings	K2
CO2	Discuss the concepts of topological spaces	K2
CO3	Examine the characterizations of topological spaces	K4
CO4	Infer the nature of continuity of the functions	K4
CO5	Analyze the concepts of connectedness and its properties.	K4

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

#### Mapping Course Outcomes with

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2	2	2		3	2		2	3	22
CO2	3	3			2	2	2		3	2		3	3	23
CO3	3	3			2	2	2		3	2		2	3	22
CO4	3	3			2	2	2		3	2	3	2	2	24
CO5	3	3			2	2	2		3	2		2	3	22
Grand Total of COs with POs & PSOs														113
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{113}{46}$														2.5

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.5
Observation	COs of Elements of Topology are strongly correlated with POs & PSOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATUR – 625 514**  
**DEPARTMENT OF MATHEMATICS**

**Internship**

(For those who join from June 2022 onwards)

**Class : III B.Sc. Mathematics**  
**Semester : V**  
**Course Code : 22UINT15**

**Part : V**  
**Hours : 30**  
**Credits: 1**

**Objective:**

This course provides platform for the learners to get exposed to a new kind of learning environment for gaining significant experience on working with mathematical applications and for acquiring the skills of employability

**Outline**

- The students shall undertake their internship from IV semester holidays and must submit the report and attendance certificate before the external examinations of V semester.
- The students must periodically report their progress and status to their respective Staff-Incharge / supervisor.
- The students must complete their internship of 25 days by undertaking any one of the following ways
  - The students shall work as intern in any of the related forums of their feasibility such as company, firms, NGO etc.
  - The students shall participate in the internship programs offered by other Institutions / Colleges / Universities.
  - The students shall work under faculty of other colleges and acquire exposure to any of the topics in mathematics.

**Evaluation :**

**Internal - 50 marks**

Attendance and Progress Report

**External – 50 marks**

Final Report & Viva-Voce

**Total – 100 marks**

### Course Outcomes (CO):

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Articulate their acquired knowledge in different fields of study	K3
CO2	Acquire and employ the skills of communication, problem solving, critical thinking in the context of employability	K3
CO3	Correlate the theoretical conceptualization to practical utility	K4
CO4	Work in projects by experimenting, exploring, integrating and appreciating the implication of mathematical concepts	K4
CO5	Develop and apply the skill of documentation of their works	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

### Mapping Course Outcomes with

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	2	2	2	2	3	2	3	3	2	2	2	3	31
CO2	3	2	2	2	2	3	2	3	3	2	2	2	3	31
CO3	3	2	2	2	2	3	2	3	3	2	2	2	3	31
CO4	3	2	2	2	2	3	2	3	3	2	2	2	3	31
CO5	3	2	2	2	2	3	2	3	3	2	2	2	3	31
Grand Total of COs with POs & PSOs														155
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{155}{65}$														2.4

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.4
Observation	COs of Internship are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATUR – 625 514

DEPARTMENT OF MATHEMATICS

Statistical Methods in Social Sciences

(For those who joined in June 2022 onwards)

Class : III UG

Part : SLC - Optional

Semester : V

Credits: 3

Course Code : 22UMASL5

**Objective:**

This course enables the learners to apply statistical methods to the problems of real life.

**Course Outline:**

**Unit 1:** Arithmetic mean – measures of dispersion – standard deviation – mean square deviation – coefficient of variation – variance

**Unit 2:** Correlation coefficient for two variables – rank correlation

**Unit 3:** Sampling – different kinds of samples

**Unit 4:** Small samples – t–distribution – F-distribution

**Unit 5:** Analysis of variance – one criterion and two criterion of classifications

**Book for Study**

Arumugam, S., *Statistics*, New Gamma Publishing House, Palayamkottai, 2004.

Unit 1 : Chapter 2 Sections: 2.1, 3.1

Unit 2 : Chapter 6 Sections: 6.0 – 6.2

Unit 3 : Chapter 14 Section: 14.1

Unit 4 : Chapter 15 Section: 15.1

Unit 5 : Chapter 17 Sections: 17.1, 17.2

**Books for Reference:**

1. Agarwal B.L., *Basic Statistics*, Wiley Eastern Limited, New Delhi, 2004.

2. Gupta S.P., *Statistical Methods*, Sultan Chand and Sons, New Delhi, 2006.

**Teaching Learning Methods:**

- Lecture Method, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Calculate mean and standard deviation for the given data	K3
CO2	Find the correlation coefficient using different methods	K3
CO3	Explain sampling and its types	K2
CO4	Apply parametric and non-parametric tests	K3
CO5	Employ ANOVA and make inferences	K3

**K1 =Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create**

**Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	2		2		2			3		3		2	17
CO2	3	2		2		2			3		3		2	17
CO3	3	2		2		2			2		2		2	15
CO4	3	2		2		2			3		3		2	17
CO5	3	2		2		2			3		3		2	17
Grand Total of COs with POs & PSOs														83
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{83}{35}$														2.37

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.37
Observation	COs of Statistical methods in Social Sciences are strongly correlated with POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF MATHEMATICS**

**Linear Algebra**

(For those who join from June 2022 onwards)

**Class : III B.Sc. Mathematics**

**Part : III/Core 11**

**Semester : VI**

**Hours : 90**

**Course Code : 22UMAD16**

**Credits : 5**

**Objective :**

This course makes the learners acquire intense knowledge on Vector space and Matrix theory

**Course Outline:**

**Unit 1: Vector Spaces**

Definition and examples – subspaces – linear transformations – fundamental theorem of homomorphism – span of a set. **(18 hours)**

**Unit 2: Linear independence**

Basis and dimension – rank and nullity – matrix of a linear transformation – maximal linearly independent set – minimal generating set. **(18 hours)**

**Unit 3: Inner product spaces**

Definition and examples – Schwartz inequality – orthogonality – Gram-Schmidt orthogonalization process – orthogonal complement. **(18 hours)**

**Unit 4: Theory of matrices**

Algebra of matrices – types of matrices – inverse of a matrix canonical form – similarity of matrices – rank – simultaneous linear equations. **(18 hours)**

**Unit 5: Eigen Values**

Characteristic equation of a matrix – Cayley-Hamilton theorem – eigen values and eigen vectors. **(18 hours)**

**Book for Study**

Arumugam S., Thangapandi Issac A., *Modern Algebra*, SCITECH Publications(India) Pvt Ltd., Chennai, 2018.

Unit 1	: Chapter 5	Sections: 5.0 – 5.4
Unit 2	: Chapter 5	Sections: 5.5 – 5.8
Unit 3	: Chapter 6	Sections: 6.0 – 6.3
Unit 4	: Chapter 7	Sections: 7.0 – 7.3 , 7.5, 7.6
Unit 5	: Chapter 7	Sections: 7.7, 7.8

**Books for Reference:**

1. Surjeet Singh, Qazi Zameerudin, *Modern Algebra*, Vikas Publishing House Private Limited, New Delhi, 2012.
2. Vasishtha A.R., *Modern Algebra*, Krishna Prakasham Mandir, Meerut, 2013.

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

### Course Outcomes (CO):

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Explain the concept of vector spaces and linear transformations	K3
CO2	Apply the concept of linear independence and basis	K3
CO3	Describe the concept of inner product spaces and apply Gram-Schmidt orthogonalization process	K3
CO4	Justify the theoretical conceptualization of matrices	K4
CO5	Compute Eigen values and Eigen vectors and analyze their properties	K4

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

### Mapping Course Outcomes with

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2	2	2		3	2	2	2	2	23
CO2	3	3			2	2	2		3	2	2	2	2	23
CO3	3	3			2	2	2		3	3	2	2	2	24
CO4	3	3			2	2	2		3	3	2	2	2	24
CO5	3	3			2	2	2		3	2	2	2	2	23
Grand Total of COs with POs & PSOs														117
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{117}{50}$														2.3

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.3
Observation	COs of Linear Algebra are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF MATHEMATICS

Complex Analysis

(For those who join from June 2022 onwards)

Class : III B.Sc. Mathematics

Part : III/Core 12

Semester : VI

Hours : 90

Subject Code : 22UMAD26

Credits : 5

**Objective:**

This course provides a platform for the learners for acquiring intense knowledge of complex numbers and their relationships with respect to functions, limits, derivatives and integrals.

**Course Outline:**

**Unit 1: Analytic Functions :**

Functions of a complex variable – limits – continuous functions – differentiability – Cauchy Riemann equations – analytic functions – harmonic functions – conformal mapping (18 hours)

**Unit 2: Bilinear Transformations and Power Series :**

Elementary transformations – bilinear transformations – cross ratio – power series – sequences and series – sequences and series of functions – elementary functions (18 hours)

**Unit 3: Definite Integrals :**

Definite integrals – Cauchy's theorem – Cauchy's theorem for simply and multiply connected regions – Cauchy integral formula – maximum modulus theorem – higher derivatives (18 hours)

**Unit 4: Analytic Functions as Power Series :**

Series expansions – Taylor's series – Laurent's series – zeros of an analytic function – singularities – meromorphic function (18 hours)

**Unit 5: Calculus of Residues :**

Calculus of residues – residues – Cauchy's residue theorem – argument theorem – Rouché's theorem – fundamental theorem of algebra – evaluation of definite integrals (18 hours)

**Book for Study:**

Arumugam S., Thangapand Issac A., Somasundaram A., *Complex Analysis*, SCITECH Publications (India) Pvt Ltd., Chennai, 2019.

Unit 1 : Chapter 2 Sections : 2.0 – 2.9

Unit 2 : Chapter 3 Sections : 3.0 – 3.3

Chapter 4 Sections : 4.0 – 4.4

Unit 3 : Chapter 6 Sections : 6.0 – 6.4

Unit 4 : Chapter 7 Sections : 7.0 – 7.4

Unit 5 : Chapter 8 Sections : 8.0 – 8.3

**Books for Reference:**

1. Karunakaran V., *Complex Analysis*, II edition, Narosa Publishing House Pvt. Ltd., New Delhi, 2006.
2. Lars V Ahlfors, *Complex Analysis*, McGraw Hill Book Company, Singapore, 2014 Reprint.

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Recall the concept of limits and continuity and apply the CR equations to determine the nature of complex functions	K3
CO2	Apply different types of transformations and make inferences on the geometrical properties	K3
CO3	Find the integrals and deduce the higher derivatives of complex functions	K3
CO4	Categorize the singularities by analyzing the series expansions	K4
CO5	Calculate the residues and estimate the values of integrals using contour integration	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

**Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2	2	2		3	2	2	2	2	23
CO2	3	3			2	2	2		3	2	2	2	2	23
CO3	3	3			2	2	2		3	3	2	2	2	24
CO4	3	3			2	2	2		3	3	2	2	2	24
CO5	3	3			2	2	2		3	2	2	2	2	23
Grand Total of COs with POs & PSOs														117
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{117}{50}$														2.3

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.3
Observation	COs of Complex Analysis are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF MATHEMATICS

Graph Theory

(For those who join from June 2022 onwards)

Class : III B.Sc. Mathematics

Semester : VI

Subject Code : 22UMAD36

Part : III Core 13

Hours : 90

Credits: 5

**Objective :**

This course makes the learners acquire intense knowledge of the fundamental concepts of Graph and its properties

**Unit 1: Graphs and Subgraphs**

Introduction – application of Graphs – finite and infinite graphs – incidence and degrees – isolated vertex-pendant vertex – null graph-isomorphism – sub graphs – walks, paths and circuits

**(18 hours)**

**Unit 2: Connected graphs**

Connected graphs – disconnected graphs – components – Euler graphs – Hamiltonian paths – Hamiltonian circuits – the travelling salesman problem

**(18 hours)**

**Unit 3: Trees**

Trees – definition and examples – some properties of trees – pendant vertices in a tree– distance and centers in a tree – Cut sets – definition and examples – fundamental cut sets

**(18 hours)**

**Unit 4: Planar graphs**

Planar graphs – Kuratowski's two graphs – different representation of planar graphs – Euler's graphs – plane representation and connectivity – detection of planarity

**(18 hours)**

**Unit 5: Coloring and Covering**

Coloring and Covering-Chromatic number- Chromatic partitioning- Chromatic polynomial -Matching-Coverings.

**(18 hours)**

**Book for Study**

Narsingh Deo "*Graph Theory with applications to Engineering and Computer Science*" PHI learning private limited, New Delhi, 2018.

Unit 1 : Chapter 1                      Sections: 1.1 – 1.5

                    Chapter 2                      Sections: 2.1– 2.4

Unit 2 : Chapter 2                      Sections: 2.5 – 2.10

Unit 3 : Chapter 3                      Sections: 3.1– 3.4

                    Chapter 4                      Sections: 4.1 – 4.4

Unit 4 : Chapter 5                      Sections: 5.1 – 5.5

Unit 5 : Chapter 8                      Sections: 8.1 – 8.5

**Books for Reference:**

1. Frank Harary., *Graph Theory*, Narosa Publishing House, Madras, 2011.
2. Arumugam S., Ramachandran S., *Invitation to Graph Theory*. SCITECH Publications (India) Pvt Ltd., Chennai, 2014.

**Teaching Learning Methods:**

- Lecture Method, ICT, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Recall the basics of Graph and its properties	K2
CO2	Discuss connected graphs and apply in solving travelling salesman problem	K3
CO3	Use the concepts of tree and its properties in solving problems.	K3
CO4	Examine the nature of planar graphs and planarity	K4
CO5	Make inferences on colouring and coverings	K4

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate,

**K6 = Create Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2	2	2		3	2	3	2	2	24
CO2	3	3			2	2	2		3	2	2	3	2	24
CO3	3	3			2	2	2		3	2	2	2	2	23
CO4	3	3			2	2	2		3	3	2	3	3	26
CO5	3	3			2	2	2		3	3	2	3	3	26
Grand Total of COs with POs & PSOs														123
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{123}{50}$														2.5

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.5
Observation	COs of Graph Theory are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR

DEPARTMENT OF MATHEMATICS

Industrial Optimization Techniques

(For those who join from June 2022 onwards)

Class	: B.Sc. Mathematics	Part	: III/Core-14
Semester	: VI	Hours	: 90
Course Code	: 22UMAD46	Credits	: 5

**Objective**

This course enables the learners to gain knowledge and the skill of applying optimization techniques to solve industrial oriented problems.

**Course Content:**

**Unit I: Transportation & Assignment Problems**

Transportation problems –methods of finding the feasible solution – optimum solution using MODI method - assignment problem - Hungarian Algorithm – traveling salesman problem  
(18 Hours)

**Unit II: Decision Analysis**

Introduction to decision making- decision-making process-decision-making environment- decision-making under uncertainty  
(18 Hours)

**Unit III: Inventory Models**

Inventory and its types, objectives and associated costs – inventory control problem – economic order quantity model– deterministic inventory problems with and without shortages - simulation of inventory production problems  
(18 Hours)

**Unit IV: Queuing Theory**

Queue– characteristics – Poisson and Exponential distributions – transient and steady state – Poisson process – finite and infinite queues – M/M/I and M/M/C models - simulation of queuing systems  
(18 Hours)

**Unit V Simulation**

Simulation – process of simulation – simulation models – generation of random numbers – Monte – Carlo simulation – simulation of inventory problems – simulation of queuing systems  
(18 Hours)

**Book for Study**

Kantheni Swarup, Gupta P.K., Man Mohan, *Operations Research*, Sultan Chand Sons, Educational Publishers, New Delhi, 2019.

Unit 1:	Chapter 10	Sections: 10.1-10.13
	Chapter 11	Sections: 11.1-11.3,11.7
Unit 2:	Chapter 16	Sections: 16.1-16.5
Unit 3 :	Chapter 19	Sections: 19.1 – 19.11
Unit 4 :	Chapter 21	Sections: 21.1 – 21.9 (up to model V)
Unit 5 :	Chapter 22	Sections: 22.1 – 22.9

**Books for Reference:**

1. Kalavathy S., *Operations Research*, Vikas Publishing House Private Limited, New Delhi, 2019.
2. Panner Selvam R., *Operations Research*, Prentice Hall of India Private Limited, New Delhi, 2019.

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Apply different methods to solve transportation problems and find solutions to assignment and travelling salesman problems	K3
CO2	Solve the decision-making problems under uncertain environments	K3
CO3	Determining optimal order quantity and time to various types inventory models	K3
CO4	Find optimal solutions to queuing based problems	K3
CO5	Explain and use the concept of simulation to inventory and queuing Systems	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

**Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3		3	2	3	2		3	2	3	2	2	28
CO2	3	3		3	2	3	2		3	2	3	2	2	28
CO3	3	3		3	2	3	2		3	3	3	2	2	29
CO4	3	3		2	2	3	2		3	2	3	2	2	27
CO5	2	3		3	2	3	2		3	2	3	2	2	27
Grand Total of COs with POs & PSOs														139
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{139}{55}$														2.5

Strong – 3, Medium – 2, Low – 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01-1.0</b>	<b>1.01-2.0</b>	<b>2.1-3</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of Cos with POs &amp; PSOs</b>			<b>2.5</b>
<b>Observation</b>	<b>COs of Industrial Optimization Techniques are strongly correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF MATHEMATICS**  
**Java Programming**  
(For those who join in June 2022 onwards)

**Class** : III B.Sc. Mathematics **Part** : III /Core Elective 2  
**Semester** : VI **Hours** : 30  
**Course Code** : 22UMAE26 (A) **Credits** : 2

**Objective:**

This course intends to make the learners gain knowledge on Java Programming Language.

**Course Outline:**

- Unit 1: Elements of Java**  
Java constants – variables - datatypes – Declaration of variables – Java Operators –  
Mathematical functions **(6 hours)**
- Unit 2: Decision making and Branching**  
Simple if statements – The if...else statement – Nesting of if...else statements –  
The else if Ladder – The Switch statements **(6 hours)**
- Unit 3: Decisionmaking and Looping**  
The while statement - The do statement - the for statements – Labelled Loops  
**(6 hours)**
- Unit 4: Classes, objects and Methods**  
Accessing class members -constructors – methods overloading – static members.  
**(6 hours)**
- Unit 5: Arrays**  
One dimensional array -creating an array – two dimensional arrays - Strings  
**(6 hours)**

**Book for Study:**

Balagurusamy E., *Programming with Java A Primer*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2012.

Unit 1 : Chapter 4	Sections: 4.1 – 4.6
Chapter 5	Sections: 5.1-5.9 , 5.15
Unit 2 : Chapter 6	Sections: 6.1-6.7
Unit 3 : Chapter 7	Sections: 7.1-7.6
Unit 4 : Chapter 8	Sections: 8.1 – 8.9
Unit 5 : Chapter 9	Sections: 9.1 – 9.5

**Books for Reference:**

1. Herbert Schildt., *The Complete Reference: Java J2SE*, Tata McGraw-Hill Publishers Private Limited, New Delhi, 2011.
2. John Hubbard R., *Programming with Java*, McGraw-Hill International Editions, Schaum's Outline Series, Madras, 2012.

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Apply the basics of Java language in programming	K3
CO2	Employ different branching statements in programming	K3
CO3	Develop Java programming by using looping statements for recursion.	K3
CO4	Construct classes and objects in programming to determine solutions	K3
CO5	Write programs using the concept of arrays	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

**Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2		2	2	3		3			18
CO2	3	3			2	2	2	2	3	2	3		2	24
CO3	3	3			2	2	2	2	3	2	3		2	24
CO4	3	3			2		2	2	3		3			18
CO5	3	3			2	2	2	2	3	2	3		2	24
Grand Total of COs with POs & PSOs														108
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{108}{44}$														2.5

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.5
Observation	COs of Java Programming are strongly correlated with POs & PSOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF MATHEMATICS**

**Java Programming Lab**

(For those who join from June 2022 onwards)

<b>Class</b>	<b>: III B.Sc. Mathematics</b>	<b>Part</b>	<b>: III /Core Elective -2</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>: 30</b>
<b>Course Code</b>	<b>: 22UMAJ16 (A)</b>	<b>Credits</b>	<b>: 1</b>

**Objective :**

This course will develop the Java programming skills of the learners.

**Course Outline:**

**List of Programs**

Write a Java program

1. To find the largest number among the given three numbers.
2. To find the prime numbers from 3 to 300.
3. To find the perfect numbers from 5 to 500.
4. To determine  $nCr$  and  $nPr$  for the given values  $n$  and  $r$ .
5. To check whether a given number is Palindrome or not.
6. To find  $y(x)$  at any value of  $x$  using Newton's forward interpolation formula.
7. To sort the numbers using the concepts of arrays.
8. To determine the inverse the given two matrices.
9. To find the product the given two matrices.
10. To prepare the Pay clips by using class and objects.

**Book for Study:**

Balagurusamy E., *Programming with Java A Primer*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2012.

**Books for Reference:**

1. Herbert Schildt., *The Complete Reference: Java J2SE*, Tata McGraw-Hill Publishers Private Limited, New Delhi, 2011.
2. John Hubbard R., *Programming with Java*, McGraw-Hill International Editions, Schaum's Outline Series, Madras, 2012.

**Teaching Learning Methods:**

Lecture Method, ICT, Hands-on -session

### Course Outcomes (CO):

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Comprehend and apply the nuances of Java programming language	K3
CO2	Apply branching statements in developing programs	K3
CO3	Employ the concept of looping in Programming.	K3
CO4	Write programs using classes and objects	K3
CO5	Use arrays to handle matrix operations	K3

K1=Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 =Create

### Mapping Course Outcomes with

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2	2	2	2	2		3			19
CO2	3	3			2	2	2	2	2		3			19
CO3	3	3			2	2	2	2	2		3			19
CO4	3	3			2	2	2	2	2		3			19
CO5	3	3			2	2	2	2	2		3			19
Grand Total of COs with POs & PSOs														95
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{95}{40}$														2.4

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.4
Observation	COs of Java Programming Lab are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR

DEPARTMENT OF MATHEMATICS

R Programming

(For those who join from June 2022 onwards)

Class	: B.Sc. Mathematics	Part	: III/Core Elective-2
Semester	: VI	Hours	: 30
Course Code	: 22UMAE26 (B)	Credits	: 2

**Objective:**

This course aims in imparting R programming skills to the learners for effective data visualization and analysis.

**Course Outline:**

**Unit 1 Fundamentals of R**

Introduction to R programming - Installing R and R Studio - R Studio overview- working in the console

- arithmetic operators -logical operators – functions **(6 Hours)**

**Unit 2 Data Structures in R**

Creating variables - numeric, character and logical data – vectors – data frames– factors

- sorting numeric, character, factor - vectors **(6 Hours)**

**Unit 3 Plotting in R**

Statistical graphs - Scatter Plots - Box Plots – Histograms – Bar plots – pie chart - ggplot2

package to visualize data – ggthemes for customization **(6 Hours)**

**Unit 4 Control Structures & Packages in R**

Conditional statements in R – loop statements - R packages - installing and loading

packages -setting up your working directory - working with missing data **(6 Hours)**

**Unit 5 Statistical Analysis in R**

Descriptive statistics in R - measures of central tendency - measures of variability - skewness and kurtosis - summary functions –correlations – inferential statistics in R – parametric tests

–non parametric tests **(6 Hours)**

**Books for Study**

Davies, Tilman M. *The book of R: A first course in programming and statistics*. No Starch Press, 2020.

Unit 1:	Chapter 1	Sections 1.1 – 1.4
Unit 2:	Chapter 2	Sections 2.1-2.3
	Chapter 3	Sections 3.1-3.4
Unit 3 :	Chapter 7	Sections 7.1-7.4
Unit 4 :	Chapter 10	Sections 10.1 – 10.3
Unit 5 :	Chapter 13	Sections 13.1 – 13.2
	Chapter 16	Sections 16.1-16.2

**Book for Reference**

1. Richard Hurley, *Data Science A Comprehensive Guide to Data Science, Data Analytics, Data Mining, Artificial Intelligence, Machine Learning, and Big Data*, Ationa Publications, 2020
2. Zumel, Nina, and Mount, John, *Practical Data Science with R*, Manning Publications, 2019.
3. Shah, Chirag, *A Hands-On Introduction to Data Science*, Cambridge University Press, 2020.

**Teaching Learning Methods:**

Lecture Method, ICT, Group Discussion

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Explain the fundamentals of R programming languages	K2
CO2	Comprehend the different data structures in R	K2
CO3	Apply different plot functions to visualize the data sets	K3
CO4	Use suitable conditional and loop statements in R programs and install necessary packages	K3
CO5	Employ respective statistical functions to the given data sets	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

**Mapping Course Outcomes with**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2		2	2	3		3			18
CO2	3	3			2	2	2	2	3	2	3		2	24
CO3	3	3			2	2	2	2	3	2	3		2	24
CO4	3	3			2		2	2	3		3			18
CO5	3	3			2	2	2	2	3	2	3		2	24
Grand Total of COs with POs & PSOs														108
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{108}{44}$														2.5

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.5
Observation	COs of R Programming are strongly correlated with POs & PSOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF MATHEMATICS**

**R Programming Lab**

(For those who join from June 2022 onwards)

<b>Class</b>	<b>: B.Sc. Mathematics</b>	<b>Part</b>	<b>: III/Core Elective Lab</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>: 30</b>
<b>Course Code</b>	<b>: 22UMAJ16 (B)</b>	<b>Credits</b>	<b>: 1</b>

**Objective:**

This course enables the learners to acquire R programming skills.

**Course Outline:**

**List of Programs**

1. Write R programs for applying different operators to the given data sets.
2. Write R programs using the following Flow control statements.
  - a) if-else
  - b) for Loops
  - c) Nested for loops
  - d) while Loops
  - e) repeat Loops
  - f) next, break
3. Write R programs for representing the given data sets graphically using the following graphs with ggplot package.
  - a) Box Plot
  - b) Histograms
  - c) Scatter Plot
  - d) Line chart
  - e) Bar Chart
  - f) Heat maps
4. Write R programs for finding the following for a given data set.
  - a) measures of central tendency
  - b) measures of variability
  - c) skewness and kurtosis
  - d) Corelation
  - e) Regression
5. Write R programs for applying the following tests for the given data sets.
  - a) parametric tests
  - b) non-parametric test

**Book for Study**

Davies, Tilman M. *The book of R: A first course in programming and statistics*. No Starch Press, 2020.

### Books for Reference

1. Richard Hurley, *Data Science A Comprehensive Guide to Data Science, Data Analytics, Data Mining, Artificial Intelligence, Machine Learning, and Big Data*, Ationa Publications, 2020
2. Zumel, Nina, and Mount, John, *Practical Data Science with R*, Manning Publications, 2019.
3. Shah, Chirag, *A Hands-On Introduction to Data Science*, Cambridge University Press, 2020.

### Teaching Learning Methods:

Lecture Method, ICT, Hands-on -session

### Course Outcomes (CO):

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Comprehend and apply the operators of R programming language	K3
CO2	Use flow control statements in writing R programs	K3
CO3	Apply ggplot to visualize the data graphically	K3
CO4	Employ statistical functions to draw descriptive statistical measures to the given data sets	K3
CO5	Determine the inferential statistical measures to the given data sets	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create  
Mapping Course Outcomes with

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3			2	2	2	2	2		3			19
CO2	3	3			2	2	2	2	2		3			19
CO3	3	3			2	2	2	2	2		3			19
CO4	3	3			2	2	2	2	2		3			19
CO5	3	3			2	2	2	2	2		3			19
Grand Total of COs with POs & PSOs														95
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{95}{40}$														2.4

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.4
Observation	COs of R Programming Lab are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATUR – 625 514

DEPARTMENT OF MATHEMATICS

**Mathematical Methods in Business**

(For those who join from June 2022 onwards)

**Class : III UG**

**Part : SLC-Optional**

**Semester : VI**

**Credits: 3**

**Course Code : 22UMASL6**

**Objective:**

This course intends to impart the knowledge of applying mathematical methods to solve business centered problems

**Course Outline:**

**Unit 1:** Roots – Square roots – Cube roots – Laws of indices – Surds – Law of Surds

**Unit 2:** Profit and Loss – Cost Price – Selling price – Percentage of profit and loss

**Unit 3:** Chain rule – Simple Proportion – Compound proportion – Direct and Indirect Proportion

**Unit 4:** Ratio and proportion – Product of extreme and means – Mean proportional

**Unit 5:** True Discount– Simple Interest – Present worth – Simple Interest on True Discount

**Book for Study**

Aggarwal, R.S., *Objective Arithmetic*, S.Chand & Company Ltd., New Delhi, 2015.

Unit 1 : Chapters 5 & 9

Unit 2 : Chapter 11

Unit 3 : Chapter 14

Unit 4 : Chapter 12

Unit 5 : Chapter 21

**Books for Reference:**

1. Ashish Aggarwal, *Quick Arithmetic*, S.Chand & Company Ltd., New Delhi, 2011.

2. David Novak, *Basic Mathematics*, D.C. Heath and Company, 2011.

3. Sharma J.N., Gupta R.K., *Mathematical Methods*, Krishna Prakasam Mandir, Meerut, 2010.

**Teaching Learning Methods:**

- Lecture Method, Group Discussion

### Course Outcomes (CO):

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Find the roots of the equation	K3
CO2	Solve the problems based on percentage	K3
CO3	Calculate solutions to the problems of direct & indirect proportion	K3
CO4	Resolve the problems based on ratio and proportion	K3
CO5	Compute solutions to the problems of simple interest & discount	K3

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create

### Mapping Course Outcomes with

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	2		2		2			3		3		2	17
CO2	3	2		2		2			3		3		2	17
CO3	3	2		2		2			2		2		2	15
CO4	3	2		2		2			3		3		2	17
CO5	3	2		2		2			3		3		2	17
Grand Total of COs with POs & PSOs														83
Mean Value of Cos with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{83}{35}$														2.37

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs & PSOs			2.37
Observation	COs of Mathematical Methods in Business are strongly correlated with POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF MATHEMATICS**  
**DATA ANALYSIS USING R**  
 (For those who joined in June 2023 onwards)

**Course Code** : \_\_\_\_\_ **Semester** : ODD  
**Hours** : 30

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**Objective:**

This course intends to make the learners efficient in analysing the data using R programming

**Course Content:**

**Unit I :** Introduction to R programming - installing R and R Studio - R Studio overview-  
 working in the console - arithmetic operators -logical operators – functions  
**(6 hours)**

**Unit II :** Data structures in R - creating variables - numeric, character and logical data –  
 vectors – data frames – factors - sorting numeric, character, and factor vectors  
**(6 hours)**

**Unit III :** Control statements in R – loop statements- R packages - installing and loading  
 packages - setting up your working directory - working with missing data  
**(6 hours)**

**Unit IV :** Statistical graphs - Scatter Plots - Box Plots – Histograms – Bar plots – pie chart –  
 ggplot2 package to visualize data – ggthemes for customization  
**(6 hours)**

**Unit V :** Descriptive statistics in R - measures of central tendency - measures of variability  
 – skewness and kurtosis - summary functions –correlations – inferential statistics in R – parametric  
 tests – non parametric tests **(6 hours)**

**Books for Reference :**

1. Peng, R.D., *R Programming for Data Science*, Lean publishing, 2020
2. Hadley Wickham and Garrett Gorlemund., *R for Data Science*, O'Reilly, 2018.

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Comprehend the fundamentals of R programming	K2
CO2	Create variables and use various operators	K3

<b>CO3</b>	Use flow control statements in simple programs	K3
<b>CO4</b>	Visualize data using graphic packages	K3
<b>CO5</b>	Draw inferences employing statistical packages	K3

**K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 Evaluate, K6 = Create**

### Mapping Course Outcomes with POs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with POs
<b>CO1</b>	3	3				2		2	10
<b>CO2</b>	3	3				3		2	11
<b>CO3</b>	3	3				3		2	11
<b>CO4</b>	3	3				3		2	11
<b>CO5</b>	3	3				3		2	11
Grand Total of Cos with POs									54
Mean Value of Cos with POs = $\frac{\text{Grand Total of Cos with POs}}{\text{Number of Cos realting with POs}} = \frac{54}{20}$									2.7

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs			2.7
Observation	Cos of Data Analysis using R are strongly correlated with POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514  
DEPARTMENT OF MATHEMATICS**

**INTRODUCTION TO STATISTICAL PACKAGE FOR SOCIAL SCIENCES (SPSS)**  
(For those who joined in June 2023 onwards)

**Course Code :**  
**Hours : 30**

**Semester: ODD**

**Objective :**

Course will be focus on how to analyze survey questionnaire using SPSS software and also students should make aware to choose appropriate statistical technique and interpret results

**Course Outline :**

**UNIT I:** Introduction to SPSS Environment: data editor, output viewer, syntax editor – Data view window – SPSS Syntax – Data creation (6 Hours)

**UNIT II:** Importing data – Variable types in SPSS and Defining variables – Creating a Codebook in SPSS. (6 Hours)

**UNIT III:** Working with Data Computing Variables - Recoding (Transforming) Variables: Recoding Categorical String Variables using Automatic Recode (6 Hours)

**UNIT IV:** Rank Cases - Sorting Data - Grouping or Splitting Data. (6 Hours)

**UNIT V:** Basic Statistics: Meaning, Application and limitation: Basic terminologies of Population, Sample, Variables and Attributes. (6 Hours)

**Books for Study:**

Andy field (2013) : Discovering statistics using IBM SPSS statistics ,4th Edition , SAGE Publications.

**Reference Books:**

1. Richard Levin & David S.Rubin (2012): Statistics for Management,7th Edition,Pearson.
2. J K Shrma (2012) ; Business statistics , Second Edition- Pearson Education.

**Teaching Learning Methods:**

- Lecture Method, ICT, Assignment, Quiz, Group Discussion

Course Learning Outcome No.	Course Learning Outcome	Knowledge Level
CO1	To gain knowledge about SPSS	K2
CO2	To identify the variables used in SPSS	K3
CO3	To compute some operations of SPSS	K2
CO4	To classify the data	K4
CO5	To explain the basic bricks of Statistics	K2

**K1 = Knowledge, K2 = Understanding, K3 = Application, K4 = Analysis and K5 = Synthesis and Evaluation**

**Mapping Course outcome with**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Sum of COs with POs
CO1	3				1	2		3	9
CO2	3				1	2		3	9
CO3	3				1	2		3	9
CO4	3				1	3		3	10
CO5	3				1	3		3	10
Grand Total of Cos with POs									47
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs}}{\text{Number of Cos relating with POs}}$									2.35

**Strong – 3, Medium – 2, Low – 1**

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF MATHEMATICS**

**GRAPHING AND COMPUTATIONS WITH GEOGEBRA**

(For those who joined in June 2023 onwards)

**Course Code** : **Semester** : ODD  
**Hours** : 30

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**Objective:**

This course aims in imparting the skills of graphing and computation using the GEOGEBRA software

**Course Content:**

**Unit I :** Introduction to Geogebra - installing Geogebra - working in Geogebra interface – graphic view **(6 hours)**

**Unit II :** Graphing functions- drawing conics with different intrinsic values – drawing 3D Objects - Geogebra object’s properties **(6 hours)**

**Unit III :** Trigonometry ratios and graphs – inverse trigonometric functions – roots of polynomial – complex roots of quadratic equations – limits and continuity of functions in Geogebra **(6 hours)**

**Unit IV :** Vectors and matrices – differentiation and integration using Geogebra **(6 hours)**

**Unit V :** Statistics using GeoGebra – probability and distribution **(6 hours)**

**Books for Reference :**

1. Nivetha Martin, N.Ramila Gandhi, P.Pandiammal, Planes in Geogebra, SRK Publishers, 2023
2. Hall, J. and Lingefjärd, T., Mathematical Modeling: Applications with GeoGebra. John Wiley & Sons, 2016
3. Hohenwarter, M., & Hohenwarter, M. GeoGebra. Available on-line at <http://www.geogebra.org/cms/en>. 2002

**Course Outcomes (CO):**

On completion of this course the students will be able to

<b>Course Outcome No.</b>	<b>Course Outcome</b>	<b>Knowledge Level Upto</b>
<b>CO1</b>	Comprehend the fundamentals of Geogebra	K2
<b>CO2</b>	Graph 2D and 3D objects with different input values	K3
<b>CO3</b>	Compute solutions to equations and find limit value of the functions	K3

<b>CO4</b>	Apply various commands of Geogebra to find derivatives and evaluate integrals and solve problems based on vectors and matrices	K3
<b>CO5</b>	Perform statistical and probability-oriented computations	K3

**K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 Evaluate, K6 = Create**

### Mapping Course Outcomes with POs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with POs
<b>CO1</b>	3	3				2		2	10
<b>CO2</b>	3	3				3		2	11
<b>CO3</b>	3	3				3		2	11
<b>CO4</b>	3	3				3		2	11
<b>CO5</b>	3	3				3		2	11
Grand Total of Cos with POs									54
Mean Value of Cos with POs = $\frac{\text{Grand Total of Cos with POs}}{\text{Number of Cos relating with POs}} = \frac{54}{20}$									2.7

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs			2.7
Observation	Cos of Graphing and Computations with Geogebra are strongly correlated with POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF MATHEMATICS**  
**INTRODUCTION TO LaTeX**  
(For those who joined in June 2023 onwards)

**Course Code** : **Semester** : EVEN  
**Hours** : **30**

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**Objective:**

This course facilitates the learners to acquire proficiency in documentation using LaTeX typing software

**Course Content:**

**Unit I:** Installation of the software - understanding – types of TeX editors **(6 hours)**

**Unit II:** Basic formatting - bold, italicize and underline – list making environments - lists with different options **(6 hours)**

**Unit III:** Basic syntax - writing math symbols and equations – super script and subscript – creating matrix **(6 hours)**

**Unit IV:** Creating tables – multi rows and multi columns in tables – including graphics **(6 hours)**

**Unit IV:** Page layout -titles- abstract- chapters- sections- references- equation references- citation **(6 hours)**

**Book for Reference**

1. E. Krishnan, *LaTeX TUTORIALS — A Primer*, Indian TEX Users Group, 2003
2. H. Kopka and P.W. Daly, *A Guide to LaTeX*, Addison-Wesley,2003.

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Comprehend the basics of LaTeX software	K2
CO2	Format the documents by using the respective syntax	K3
CO3	Write mathematical equations by employing appropriate syntax	K3
CO4	Create tables of different forms	K3
CO5	Draft a document with essential sections	K3

**K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 Evaluate, K6 = Create**

### Mapping Course Outcomes with POs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with POs
<b>CO1</b>	3	3				2		2	10
<b>CO2</b>	3	3				3		2	11
<b>CO3</b>	3	3				3		3	12
<b>CO4</b>	3	3				3		2	11
<b>CO5</b>	3	3				3		3	12
Grand Total of Cos with POs									56
Mean Value of Cos with POs = $\frac{\text{Grand Total of Cos with POs}}{\text{Number of Cos relating with POs}} = \frac{56}{20}$									2.8

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of Cos with POs			2.8
Observation	Cos of Introduction to LaTeX are strongly correlated with POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF MATHEMATICS**  
**DATA ANALYSIS USING STATISTICAL PACKAGE FOR SOCIAL SCIENCES (SPSS)**  
 (For those who joined in June 2023 onwards)

**Course Code :**  
**Hours : 30**

**Semester: EVEN**

**Objectives:**

This course enables the students to analyse the data and know the inferential statistics on SPSS and form ANOVA table

**Course Outline :**

**UNIT-I:** Types of data - Primary data and Secondary data - Qualitative data and Quantitative data - Univariate data and Multivariate data - Discrete data and Continuous data - Concepts of measurement  
 (6 Hours)

**UNIT- II:** Types of Scale: Nominal, Ordinal, Interval, and Ratio - Different methods of presenting data - Tabular representation - Diagrammatic representation - Graphical representation  
 (6 Hours)

**UNIT III:** Exploring Data: Descriptive Statistics for Continuous Variables - The Explore procedure - Frequencies Procedure – Descriptives - Compare Means - Frequencies for Categorical Data.  
 (6 Hours)

**UNIT IV:** Analysing Data: Inferential Statistics for Association: Pearson Correlation, Chi-square Test of Independence.  
 (6 Hours)

**UNIT V:** Analysing Data: Inferential Statistics for Comparing Means: One Sample t Test, Paired Samples T Test, Independent Samples T Test, One-Way ANOVA.  
 (6 Hours)

**Books for Study:**

Andy field (2013) : Discovering statistics using IBM SPSS statistics ,4th Edition , SAGE Publications.

**Reference Books:**

1. Richard Levin & David S.Rubin (2012): Statistics for Management,7th Edition,Pearson.
2. J K Shrma (2012) ; Business statistics , Second Edition- Pearson Education.

**Teaching Learning Methods:**

- Lecture Method, ICT, Assignment, Quiz, Group Discussion

Course Learning Outcome No.	Course Learning Outcome	Knowledge Level
CO1	To utilize the features of data on SPSS	K3
CO2	To identify the types of variables used in SPSS	K3
CO3	To explore the descriptive statistics concepts on SPSS	k3

<b>CO4</b>	To excel the inferential statistics concepts on SPSS	<b>K4</b>
<b>CO5</b>	To construct ANOVA table	<b>K4</b>

**K1 = Knowledge, K2 = Understanding, K3 = Application, K4 = Analysis and K5 = Synthesis and Evaluation**

**Mapping Course outcome with**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>Sum of COs with POs</b>
<b>CO1</b>	<b>3</b>				<b>1</b>	<b>3</b>		<b>3</b>	<b>10</b>
<b>CO2</b>	<b>3</b>				<b>1</b>	<b>3</b>		<b>3</b>	<b>10</b>
<b>CO3</b>	<b>3</b>				<b>1</b>	<b>3</b>		<b>3</b>	<b>10</b>
<b>CO4</b>	<b>3</b>				<b>1</b>	<b>3</b>		<b>3</b>	<b>10</b>
<b>CO5</b>	<b>3</b>				<b>1</b>	<b>3</b>		<b>3</b>	<b>10</b>
<b>Grand Total of Cos with POs</b>									<b>50</b>
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs}}{\text{Number of Cos relating with POs}}$									<b>2.5</b>

**Strong – 3, Medium – 2, Low – 1**

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF MATHEMATICS**  
**FORENSIC MATHEMATICS**  
(For those who joined in June 2023 onwards)

**Course Code** : **Semester** : EVEN  
**Hours** : **30**

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**Objective :**

This course enables the learners acquire intense knowledge and the skills of applying Mathematics in Forensic Science.

**Course Content :**

**Unit I :** Introduction to Forensic sciences - Basic Calculus – Geometry- Matrices- Trigonometry-Probability  
**(6 hours)**

**Unit II :** Blood Spatter Analysis - droplet directionality from bloodstain patterns - determination of point of convergence and point of origin.  
**(6 hours)**

**Unit III :** Probability theory in DNA analysis and Finger print classification and matching  
**(6 hours)**

**Unit IV :** Reconstructing crime scene – scaling sketches with coordinate geometry - matrix transformations in three-dimensional crime scene reconstructions.  
**(6 hours)**

**Unit V :** Projectiles in Fire arms- Fire and explosives -reconstruction of motor accident – collision and effects of impact  
**(6 hours)**

**Books for Reference :**

1. Adam, Craig. Essential Mathematics and Statistics for forensic science. John Wiley & Sons, 2011.
2. B S Nabar , Forensic Science in Crime Investigation, Asia Law House, Hyderabad, 3rd edition, 2013.

**Course Outcomes (CO):**

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Upto
CO1	Comprehend the applications of mathematical concepts in forensic sciences	K2
CO2	Apply the trigonometric ratios to analyze blood spatter	K3
CO3	Employ the theory of probability in DNA and fingerprint analysis	K3

<b>CO4</b>	Use math concepts in reconstructing crime scenes	K3
<b>CO5</b>	Utilize the theory of projectiles, collision and impact in reconstructing accidents scenes	K3

**K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 Evaluate, K6 = Create**

**Mapping Course Outcomes with POs**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>	<b>Sum of COs with POs</b>
<b>CO1</b>	3	3		2		2		2	12
<b>CO2</b>	3	3		2		3		2	13
<b>CO3</b>	3	3		2		3		2	13
<b>CO4</b>	3	3		2		3		2	13
<b>CO5</b>	3	3		2		3		2	13
Grand Total of Cos with POs									64
Mean Value of Cos with POs = $\frac{\text{Grand Total of Cos with POs}}{\text{Number of Cos relating with POs}} = \frac{64}{25}$									2.56

**Strong – 3, Medium – 2, Low – 1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01-1.0</b>	<b>1.01-2.0</b>	<b>2.1-3</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean Value of Cos with POs</b>			<b>2.56</b>
<b>Observation</b>	<b>Cos of Forensic Mathematics are strongly correlated with POs</b>		



**DEPARTMENT OF PHYSICS**



**ARUL ANANDAR COLLEGE (Autonomous), KARUMATHUR**  
**DEPARTMENT OF PHYSICS**  
 B.Sc. Physics - CBCS Syllabus (2022-2023 Onwards)

<b>I SEMESTER</b>				
<b>PART</b>	<b>SUB. CODE</b>	<b>PAPER</b>	<b>HRS</b>	<b>CR</b>
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil/Hindi/French	6	4
II	22UENA11 22UENB11	English through Prose & Short Story – Stream-A English through Prose & Short Story – Stream-B	5	4
III	22UPYC11 22UPYP12	<b>CORE</b> Mechanics & Properties of Matter Physics Lab – I	6 3	5 --
	22UMAB11	<b>ALLIED -1</b> Ancillary Maths	5	4
	22UPYB11	Allied Physics (for Maths)		
	22UPYR12	Allied Physics Lab (for Maths)		
IV	22USBE11	Skill Based Elective-1 Office Automation & Design	1	1
	22USBP11	Office Automation & Design - Practical	2	1
	22UFCE11	FC-Personality Development	1	1
	22UCSH12	Communication Skill	1	--
	22UBRC11	Bridge Course	--	1
V	22UNCC/NSS/ PHY.EDU./ YRC /ROT/ ACF/ NCB12	NCC /NSS/ PHY.EDU./ YRC/ROT/ACF/NCB	--	--
Total			30	21
<b>II SEMESTER</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil/Hindi/French	6	4
II	22UENA22 22UENB22	English through Prose & Poetry – Stream – A English through Prose & Poetry – Stream – B	5	4
III	22UPYC22 22UPYP12	<b>CORE</b> Electricity & Electromagnetism Physics Lab – I	6 3	5 3
	22UMAB22	<b>ALLIED -2</b> Ancillary Maths	5	4
	22UPYB22	Ancillary Physics (for Maths)		
	22UPYR12	Allied Physics Lab (for Maths)		
IV	22USBE22	Skill Based Elective-2 Programming in C	2	1
	22USBP22	Programming in C – Practical	1	1

	22UFCH22	FC-Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skill	1	1
V	22UNCC/NSS/ PHY.EDU./ YRC /ROT/ ACF/ NCB12	NCC /NSS/ PHY.EDU./ YRC/ROT/ACF/NCB	--	1
<b>Total</b>			<b>30</b>	<b>25</b>
<b>III SEMESTER</b>				
I	22UTAL33/ 22UHNL33/ 22UFNL33	Tamil/Hindi/French	6	4
II	22UENA22 22UENB22	English through Literature-I (Stream-A) English through Literature-I (Stream-B)	6	4
III	22UPYC33	<b>CORE</b> Basic Electronics	6	6
	22UPYP24	Physics Lab – II	3	---
	22UPYB33	<b>Allied Physics-1 (For Chemistry)</b>	3	3
	22UPYR24	Allied Physics Practical	2	
	22UCHB33	Allied Chemistry		
	22UCHR24	Allied Chemistry Lab		
IV	22UPYN13	Non-Major Elective -1 (Arts) Popular Physics	3	2
	22UFCE33	FC-Social Analysis and Human Rights	1	1
V	22UNCC/NSS/ PHY.EDU./ YRC /ROT/ ACF/ NCB24	NCC /NSS/ PHY.EDU./ YRC/ROT/ACF/NCB	--	--
	22UARE14	ARISE		
<b>Total</b>			<b>30</b>	<b>20</b>
<b>IV SEMESTER</b>				
I	22UTAL44/ 22UHNL44/ 22UFNL44	Tamil/Hindi/French	6	4
II	22UENA22 22UENB22	English through Literature-II (Stream-A) English through Literature-II (Stream-B)	6	4
III	22UPYC44	<b>CORE</b> Heat and Thermodynamics	6	6
	22UPYP24	Physics Lab – II	3	3
	22UPYB44	<b>Allied Physics-2 (For Chemistry)</b>	3	3
	22UCHB44	Allied Chemistry		
	22UCHR24	Allied Chemistry Lab		
	22UPYR24	Allied Physics Practical	2	2
IV	22UPYN24	Non-Major Elective (Science) Basics of Applied	3	2

		Physics		
	22UFCH44	FC-Religious Literacy and Peace Ethics	1	1
V	22UNCC/NSS/ PHY.EDU./ YRC /ROT/ ACF/ NCB24	NCC /NSS/ PHY.EDU./ YRC/ROT/ACF/NCB	--	1
	22UARE14	ARISE	--	1
<b>Total</b>			<b>30</b>	<b>27</b>
<b>V SEMESTER</b>				
		<b>CORE</b>		
III	22UPYC65	Modern Physics	5	5
	22UPYC75	Optics & Spectroscopy	5	5
	22UPYC85	Mathematical Physics	5	5
	22UPYC95	Digital Electronics	4	4
	22UPYP36	Physics Lab – III	3	--
	22UPYP46	Physics Lab – IV	3	--
		<b>CORE ELECTIVE</b>		
	22UPYE15	Astrophysics / Information Technology	3	2
IV	22UINT15	Internship	-	1
	22USSI16	Soft Skill	2	--
<b>Total</b>			<b>30</b>	<b>22</b>
<b>VI SEMESTER</b>				
		<b>CORE</b>		
III	22UPYD06	Classical, Statistical and Relativistic Mechanics	5	5
	22UPYD16	Nuclear Physics	5	5
	22UPYD26	Solid state Physics	5	5
	22UPYD36	Nanophysics	4	4
	22UPYP36	Physics Lab – III	3	3
	22UPYP46	Physics Lab – IV	3	3
		<b>CORE ELECTIVE</b>		
	22UPYE26	Basic Electric Principles & Applications/ Medical Physics / <b>Optoelectronics</b>	3	2
IV	22USSI16	Soft Skills	2	2
<b>Total</b>			<b>30</b>	<b>29</b>

<b>SEMESTER</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>TOTAL</b>
<b>CREDITS</b>	<b>21</b>	<b>25</b>	<b>20</b>	<b>27</b>	<b>22</b>	<b>29</b>	<b>144</b>

<b>PART</b>	<b>CREDITS</b>
Part -I	16
Part -II	16
<b>Total</b>	<b>32</b>
<b>Part -III</b>	
Core	72
Allied	16
Core Electives	04
Internship	01
<b>Total</b>	<b>93</b>
<b>Part -IV</b>	
Non - Major Elective	04
Skill Based Elective	04
Value Education	04
Communication Skill	01
Soft Skill	02
<b>Total</b>	<b>15</b>
<b>Part -V</b>	
Bridge Course & ARISE	02
<b>TOTAL</b>	<b>144</b>

Elective for **ARTS** students : Popular Physics (III Sem.)

Elective for **OTHER SCIENCE** Students : Basics of Applied Physics (IV Sem.)

<b>SELF LEARNING COURSES</b>			
<b>Semester</b>	<b>Sub.Code</b>	<b>Paper</b>	<b>Credits</b>
III	22UPYSL3	Space Physics	3
IV	22UPYSL4	Novel Materials	3
V	22UPYSL5	Thin film Science	3
VI	22UPYSL6	Optical Communication	3

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR  
DEPARTMENT OF PHYSICS**

**PROGRAMME SPECIFIC OUTCOME (PSO)**

- PSO1:** Understand the basic concepts of physics for the applications in various scientific and industrial arena.
- PSO2:** Acquire the problem-solving skills and experimental skills keeping in mind the needs of the society and environment.
- PSO3:** Formulate, conduct, analyze, interpret the theory and experiments in Physics effectively as an individual or a leader of a group.
- PSO4:** Utilize the experimental tools and numerical techniques with an understanding of physics concepts.
- PSO5:** Demonstrate and communicate the theoretical and experimental Physics ideas towards higher education.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF PHYSICS**

B.Sc., Physics - CBCS Syllabus (2022-2023 Onwards)

<b>I SEMESTER</b>				
<b>PART</b>	<b>SUB. CODE</b>	<b>PAPER</b>	<b>HRS</b>	<b>CR</b>
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil/Hindi/French	6	4
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream A English through Prose & Short Story – Stream B	5	4
III	22UPYC11	<b>CORE</b> Mechanics & Properties of Matter	6	5
	22UPYP12	Physics Lab – I	3	--
	22UMAB11	<b>ALLIED -1</b> Ancillary Maths	5	4
	22UPYB11	Allied Physics (for Maths )		
	22UPYR12	Allied Physics Lab (for Maths)		
IV	22USBE11	Skill Based Elective-1 Office Automation & Design	1	1
	22USBP11	Office Automation & Design - Practical	2	1
	22UFCE11	FC-Personality Development	1	1
	22UCSH12	Communication Skill	1	--
	22UBRC11	Bridge Course	--	1
V	22UNCC/NSS/ PHY.EDU./ YRC /ROT/ ACF/ NCB12	NCC/NSS/PHY.EDU./YRC/ROT/ACF/NCB	--	--
Total			30	21
<b>II SEMESTER</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil/Hindi/French	6	4
II	22UENA22 22UENB22	English through Prose & Poetry – Stream – A English through Prose & Poetry – Stream - B	5	4
III	22UPYC22	<b>CORE</b> Electricity & Electromagnetism	6	5
	22UPYP12	Physics Lab – I	3	3
	22UMAB22	<b>ALLIED -2</b> Ancillary Maths	5	4
	22UPYB22	Ancillary Physics (for Maths)		
	22UPYR12	Allied Physics Lab (for Maths)		
IV	22USBE22	Skill Based Elective-2 Programming in C	2	1

	22USBP22	Programming in C – Practical	1	1
	22UFCH22	FC-Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skill	1	1
V	22UNCC/NSS/ PHY.EDU./ YRC /ROT/ ACF/ NCB12	NCC/NSS/PHY.EDU./YRC/ROT/ACF/NCB	--	1
<b>Total</b>			<b>30</b>	<b>25</b>
<b>III SEMESTER</b>				
I	22UTAL33/ 22UHNL33/ 22UFNL33	Tamil/Hindi/French	6	4
II	22UENG22	English through Literature-I	6	4
III		<b>CORE</b>		
	22UPYC33	1. Basic Electronics	6	6
	22UPYP24	2. Physics Lab – II	3	---
	22UPYB33	<b>Allied Physics-1 (For Chemistry)</b>	3	3
	22UPYR24	Allied Practical	2	
	22UCHB33	Allied Chemistry		
IV	22UCHN13	Basic Tamil/Advanced Tamil/Non Major Elective -1 (Arts) Popular Physics	3	2
	22UFCE33	FC-Social Analysis and Human Rights	1	1
V	22UNCC/NSS/ PHY.EDU./ YRC /ROT/ ACF/ NCB24	NCC/NSS/PHY.EDU./YRC/ROT/ACF/NCB	--	--
	22UARE14	ARISE		
<b>Total</b>			<b>30</b>	<b>20</b>
<b>IV SEMESTER</b>				
I	22UTAL44/ 22UHNL44/ 22UFNL44	Tamil/Hindi/French	6	4
II	22UENG22	English through Literature-II (Stream-A)	6	4
III		<b>CORE</b>		
	22UPYC44	Heat and Thermodynamics	6	6
	22UPYP24	Physics Lab – II	3	3
	22UPYB44	<b>Allied Physics-2 (For Chemistry)</b>	3	3
	22UCHB44	Allied Chemistry		
	22UCHR24-	Allied Chemistry Lab		
IV	22UPYR24	Allied Physics Practical (For Chemistry)	2	2
	22UCHN24	Basic Tamil/Advanced Tamil/Non Major Elective (Science) Basics of Applied Physics	3	2

	22UFCH44	FC-Religious Literacy and Peace Ethics	1	1
V	22UNCC/NSS/ PHY.EDU./ YRC /ROT/ ACF/ NCB24	NCC/NSS/PHY.EDU./YRC/ROT/ACF/NCB	--	1
	22UARE14	ARISE	--	1
<b>Total</b>			<b>30</b>	<b>27</b>
<b>V SEMESTER</b>				
		<b>CORE</b>		
III	22UPYC65	Modern Physics	5	5
	22UPYC75	Optics & Spectroscopy	5	5
	22UPYC85	Mathematical Physics	5	5
	22UPYC95	Digital Electronics	4	4
	22UPYP36	Physics Lab – III	3	--
	22UPYP46	Physics Lab – IV	3	--
			<b>CORE ELECTIVE</b>	
	22UPYE15	Astrophysics / Information Technology	3	2
IV	22UINT15	Internship	-	1
	22USSI16	Soft Skill	2	--
<b>Total</b>			<b>30</b>	<b>22</b>
<b>VI SEMESTER</b>				
<b>PART</b>		<b>PAPER</b>	<b>HRS</b>	<b>CR</b>
		<b>CORE</b>		
III	22UPYD06	Classical, Statistical and Relativistic Mechanics	5	5
	22UPYD16	Nuclear Physics	5	5
	22UPYD26	Solid state Physics	5	5
	22UPYD36	Nanophysics	4	4
	22UPYP36	Physics Lab – III	3	3
	22UPYP46	Physics Lab – IV	3	3
			<b>CORE ELECTIVE</b>	
	22UPYE26	Basic Electric Principles & Applications/ Medical Physics / <b>Optoelectronics</b>	3	2
IV	22USSI16	Soft Skills	2	2
<b>Total</b>			<b>30</b>	<b>29</b>

<b>SEMESTER</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>TOTAL</b>
<b>CREDITS</b>	<b>21</b>	<b>25</b>	<b>20</b>	<b>27</b>	<b>22</b>	<b>29</b>	<b>144</b>

<b>PART</b>	<b>CREDITS</b>
Part -I	16
Part -II	16
<b>Total</b>	<b>32</b>
<b>Part -III</b>	
Core	72
Allied	16
Core Electives	04
Internship	01
<b>Total</b>	<b>93</b>
<b>Part -IV</b>	
Non - Major Elective	04
Skill Based Elective	04
Value Education	04
Communication Skill	01
Soft Skill	02
<b>Total</b>	<b>15</b>
<b>Part -V</b>	
Bridge Course & ARISE	02
<b>TOTAL</b>	<b>144</b>

Elective for **ARTS** students : Popular Physics (III Sem.)  
 Elective for **OTHER SCIENCE** Students : Basics of Applied Physics (IV Sem.)

<b>SELF LEARNING COURSES</b>			
<b>Semester</b>	<b>Sub.Code</b>	<b>Paper</b>	<b>Credit</b>
III	22UPYSL3	Space Physics	3
IV	22UPYSL4	Novel Materials	3
V	22UPYSL5	Thin film Science	3
VI	22UPYSL6	Optical Communication	3

**Arul Anandar College (Autonomous), Karumathur**

**Department of Physics**

**Class : B.Sc. Physics**

**Part : III Core-6**

**Semester : V**

**Hours : 75**

**Subject Code : 22UPYC65**

**Credit : 5**

**MODERN PHYSICS**

**(For Students admitted from the Academic Year 2019-2020 onwards)**

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**Course Objectives**

- To acquire the concepts of dual nature and quantum theory of light
- To enrich the knowledge on wave function, wave equations and operators.
- To analyse the physical importance of various atomic models.
- To understand the concepts of magnetic dipole moment, coupling schemes and selection rules.
- To study the magnetic and electric field effects by Zeeman and Stark effects

**Unit I Dual Nature**

**(15 hours)**

Photoelectric Effect – Quantum Theory of Light – Work function – X-Rays-X-Ray diffraction- Compton Effect. De Broglie Waves-Waves-Phase and Group velocities-Particle Diffraction – Davisson – Germer experiment – Uncertainty Principle – I and II

**Unit II Quantum Mechanics**

**(15 hours)**

Wave function-Normalization- Well-behaved Functions-The Wave Equation- Partial Derivatives-Schrodinger Equation time dependent form- Validity of Schrodinger Equation - Linearity and superposition-Expectation Values-Operators (Momentum and Energy)- Schrodinger's Equation: Steady state Form-Eigen values and Eigen functions-Operators and Eigen values-Particle in a Box (Wave functions, Momentum, Momentum eigen values and Momentum eigen functions for trapped particle) -Finite Potential Well-Tunnel Effect-Harmonic Oscillator (frequency of harmonic oscillator, Energy levels, Wave function).

**Unit III Atomic models**

**(15 hours)**

Rutherford Alpha particle scattering theory – Bohr atom model–Sommerfeld's relativistic atom model– Fine structure of the  $H_{\alpha}$  Line – The Vector Atom Model – Quantum numbers associated with the Vector atom model– Coupling schemes (L-S and J-J Coupling) – The Pauli Exclusion Principle – The Periodic Classification of elements– Electron Configuration with their modern symbolic representations.

**Unit IV Magnetic Dipole Moment & Spectra**

**(15 hours)**

Magnetic Dipole Moment of an Electron due to Orbital and Spin Motion – Bohr Magneton – The Stern and Gerlach Experiment – Optical Spectra- - Spectral terms –Spectral notation-The Selection Rules – Intensity Rules – Interval Rule – Fine Structure of the Sodium D Line - Fine structure of  $H_{\alpha}$  line

## Unit V Magnetic and Electric field effects

(15 hours)

Zeeman Effect – Experimental Arrangement – Expression for the Zeeman shift-Larmor's Theorem – Quantum Mechanical Explanation of the Normal Zeeman Effect – Anomalous Zeeman Effect – Theoretical Explanation – Lande's Factor – Explanation of Splitting of D1, D2 Lines of Sodium – Paschen Back Effect – Stark Effect.

### Text Books:

1. Arthur Beiser, Shobhit Mahajan, S.Rai Choudhury, 2017, Concepts of Modern Physics, 7<sup>th</sup> edition, McGraw Hill, New Delhi.  
Unit I – Ch: 2.3, 2.5, 2.6, 2.7, 3.1,3.2,3.3,3.4, 3.5 3.7, 3.8; Unit II – Ch: 5.1 to 5.7.1, 5.7.2, 5.8, 5.9, 5.10,5.11
2. Murugesan, R., Er. Kiruthiga Sivaprasath, 2022, Modern Physics, S. Chand Publications, New Delhi.  
Unit III – 4.1,4.2, 4.3, 4.11- 4.17; Unit IV – 4.18 to 4.22 ; Unit V – 4.23 to 4.28

### References:

1. Halliday & Resnick, 2018, Fundamentals of Physics, 11th ed. John Wiley & Sons.
2. G. Aruldas Quantum Mechanics, Prentice Hall India Learning Private Limited; 2nd edition (1 January 2008)
3. N. Subrahmanyam, Brijlal, Jivan Seshan, 2017, Atomic & Nuclear Physics, S. Chand & Co.
4. J. B. Rajam, Modern Physics, S. Chand & Co.
5. Nk Sehgal DI Sehgal, KI Chopra, 2013, Modern Physics, Sultan Chand and Sons, New Delhi
6. Modern Physics, S. Ramamoorthy, National Publishing & Co.

### Weblinks/E - Resources:

1. <https://www.toppr.com/guides/physics/mechanics/modern-physics/>
2. <https://galileo.phys.virginia.edu/classes/252/home.html>

### Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, Group Discussion

### Course Outcomes

On completion of the course, the students will be able to

**CO1:** Understand the concepts of dual nature and quantum theory of light

**CO2:** Acquire knowledge on wave function, wave equations operators and Harmonic Oscillator.

**CO3:** Interpret the physical importance of various atomic models.

**CO4:** Analyze the magnetic dipole moment, coupling schemes and selection rules.

**CO5:** Illustrate the magnetic and electric field effects by Zeeman and Stark effects

**Mapping of COs with PSOs & POs:**

SEMESTER V	Subject Code:								Title of Paper: Modern Physics					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2		2	1	2	1	1	3	3	3	3	3	27
CO2	3	1		3	2	2			3	2	3	3	3	25
CO3	2	2		2	2	3	1	1	3	2	3	3	3	27
CO4	3	2		2	2	3		1	3	3	3	3	3	27
CO5	3	2		2	2	3		1	3	2	3	3	3	27
Grand total of COs with PSOs and POs													133	
Mean value of COs with PSOs and $POs = \frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{133}{56}\right)$													2.375	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.34
Observation	<b>COs of Modern Physics strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**  
**Department of Physics**

**Class : B.Sc. PHYSICS**

**Part : III Core -7**

**Semester : V**

**Hours : 75**

**Subject Code : 22UPYC75**

**Credit : 5**

**OPTICS AND SPECTROSCOPY**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives:**

- To understand the basics on interference.
- To enrich knowledge on diffraction.
- To clarify the effects of polarization.
- To understand the basics of spectroscopy.
- To compare the IR and Raman Spectra.

**Unit I Interference**

**(15 hours)**

Light waves – Superposition of waves – Interference – Theory of interference (analytical method) – Intensity Distribution in the Fringe System – Superposition of incoherent waves – Superposition of many coherent waves – Young’s double slit experiment – Conditions for interference – Techniques for obtaining interference – Fresnel biprism – Determination of Wave Length – Variable thickness (Wedge shaped) film – Newton’s Rings – Condition for bright and dark rings – Circular fringes – Radii of dark fringes - Determination of wavelength of light.

**Unit II Diffraction**

**(15 hours)**

Huygens – Fresnel theory – Fresnel’s assumptions – Rectilinear propagation of light – Zone plate - Fresnel and Fraunhofer types of Diffraction – Theory of Plane Diffraction Grating – Resolving Power – Rayleigh’s Criterion - Resolving Power of optical instruments – Criterion for resolution according to lord Rayleigh - Resolving Power of a Prism and Plane Transmission Grating.

**Unit III Polarization**

**(15 hours)**

Polarization – Unpolarized and polarized light – Natural light (unpolarized) – Types of polarization – Production of plane polarized light - Polarization by Reflection – Polarizing Angle and Brewster’s Law – Polarization by refraction-Pile of Plates – Polarization by scattering – Double Refraction – Polarizer and Analyzer – Malus law – Anisotropic Crystals – Double refraction in calcite crystal – Nicol Prism – Retarders ( quarter and half wave plates) — Optical activity – Optical rotation – Specific rotation - Fresnel’s explanation.

#### **Unit IV Introduction to Spectroscopy**

**(15 hours)**

Characterization of Electromagnetic Radiation – The Quantization of Energy – Region of the Spectrum – Basic elements of practical spectroscopy – Signal to noise ratio and resolving power - Width and Intensity of Spectral Lines – Microwave Spectroscopy – Rotation of Molecules – Rotational Spectra – Diatomic Molecules.

#### **Unit V IR & Raman spectroscopy**

**(15 hours)**

Infra-Red Spectroscopy – Vibrating Diatomic Molecule – Diatomic Vibrating Rotator – Vibration – Rotation Spectrum of Carbon Mono Oxide – Breakdown of the Born – Oppenheimer Approximation. Raman Spectroscopy: –Quantum Theory of Raman effect – pure rotational Raman spectra, Raman Activity of Vibrations.

#### **Text Books:**

1. Brijlal and Subramanyam and Avadhanulu, 2006, 23<sup>rd</sup>Edn.,Textbook of Optics, S.Chand and Company, New Delhi.  
(Unit1)–Chapter14.1-14.4,14.4.1(a),14.4.2-14.4.4,14.5,14.7-14.9,15.5-15.6,15.6.1-15.6.3, 15.6.7;  
(Unit 2)– Chapter 17.2-17.5,17.7, 18.7, 19.1, 19.2, 19.5, 19.6, 19.11, 19.12.  
(Unit 3) – 20.1-20.6, 20.6.1-20.6.3, 20.6.5, 20.8-20.12, 20.19, 20.21, 20.27, 20.28-20.30
2. Banwell, C.N. & McCash, E.M., 2007, Fundamentals of molecular spectroscopy, Tata McGraw Hill, 4th ed.  
(Unit 4.4 – Chapter 1.1-1.3, 1.5-1.7, Chapter 2.1- 2.3.1; Unit 5 – Chapter 3.1-3.4, Chapter 4.1.1,4.2, 4.3.1)

#### **References:**

1. Jenkins and White, 1981, Fundamentals of Optics-McGraw Hill International
2. Pedrotti and Pedrotti, 1987, Introduction to Optics- Prentice Hall International.
3. Murugesan, R.& Kiruthiga Sivarakash, 2006, Optics and Spectroscopy, S. Chand & Publ.

#### **Weblinks/E - Resources:**

1. <https://www.ossila.com/pages/optical-spectroscopy>
2. <https://www.sciencedirect.com/topics/medicine-and-dentistry/optical-spectroscopy>
3. <https://www.avantes.com/support/theoretical-background/introduction-to-spectrometers/>

#### **Teaching Learning Methods:**

- Lecture Method, Demonstration, ICT, Assignment, Quiz, Group Discussion

#### **Course Outcomes**

On completion of the course, the students will be able to

- CO 1:** Acquire knowledge on the concepts of interference of light waves and their applications
- CO 2:** Understand the effect of diffraction in prism and grating
- CO 3:** Apply the concept of polarization in certain fields.
- CO 4:** Explain concepts of electromagnetic radiation and microwave spectroscopy
- CO 5:** Compare the principles of Infra-red and Raman Spectroscopy

**Mapping of COs with PSOs & POs:**

SEMESTER V	Subject Code:								Title of Paper: OPTICS AND SPECTROSCOPY					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2		2	3	3			3	3	3	2	3	27
CO2	2	3		1	2	3	1		3	3	3	2	3	26
CO3	3	3		2	3	3		1	3	3	2	3	3	29
CO4	3	2		3	3	2	1		3	2	3	3	2	27
CO5	3	3		2	3	2		1	3	3	2	3	3	28
Grand total of COs with PSOs and POs													137	
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{137}{54}\right)$													2.54	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.54
Observation	<b>COs of Optics and Spectroscopy Strongly related with PSOs and POs</b>		

Arul Anandar College (Autonomous), Karumathur

Department of Physics

Class : B.Sc. PHYSICS

Part : III Core-8

Semester : V

Hours : 75

Subject Code : 22UPYC85

Credits: 5

MATHEMATICAL PHYSICS

(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:

- To facilitate the learners to elaborate the fundamentals of Vector and Scalar fields.
- To provide the students a broad view of understanding in special type of matrices which are relevant to Physics.
- To train the students developing analytical skill in various Special functions.
- To make the students gaining knowledge on Laplace Transforms and its applications to solve Simple Harmonic equation.
- To equip the students to correlate measures of Central tendency and Dispersion.

Course Outline

Unit I: Vector Analysis

(15 hrs)

Gradient of a scalar field – Line, Surface and Volume integrals – Divergence of a vector function – Expression for divergence in Cartesian Co-ordinates – Curl of a Vector function – Expression for Curl in Cartesian Co-ordinates – Gauss divergence theorem – Stoke's theorem – Green's theorem.

Unit II: Matrices

(15 hrs)

Types of Matrices – Eigen values, Eigen vectors: Characteristic equation of a matrix – Cayley Hamilton theorem – Diagonalization of Matrices – Inverse of a matrix – Non-homogeneous Linear equations – Cramer's rule for solving non-homogenous linear equations.

Unit III: The Beta and Gamma Functions

(15 hrs)

Beta function: Definition, Symmetry property, Evaluation and other forms – Gamma function: Definition, Evaluation and other forms – Relation between Beta and Gamma functions – Simple Problems.

Unit IV: Laplace Transforms

(15 hrs)

Definition of the Laplace Transforms (Laplace Transform of functions like 1, t,  $t^n$ ,  $e^{at}$ ,  $e^{-at}$ ,  $\sin at$ ,  $\cos at$ ,  $\sinh at$ ,  $\cosh at$ ,  $t \sin at$ ,  $t \cos at$ ,  $e^{at} \sin \omega t$ ,  $e^{at} \cos \omega t$ )– Laplace Transform of Derivatives – Laplace Transform of Integrals – Laplace Transform of Gamma function – Applications of Laplace Transforms to solve simple harmonic equation

Unit V: Statistics

(15 hrs)

Arithmetic Mean – Properties of the Arithmetic Mean – Median – Quartiles – Deciles – Percentiles – Mode – Empirical relation between Mean, Median and Mode – Geometric Mean – Harmonic Mean - Range – The Mean Deviation – Standard Deviation – Mean Square Deviation – Relation between Standard Deviation and Root Mean Square Deviation.

### Text Book

1. Murugesan.R (2016), Mechanics and Mathematical Physics, New Delhi: S.Chand & Company Pvt.Ltd.

Unit I : 7.2 – 7.7, 7.10 – 7.12;

Unit II : 8.1, 8.2, 8.4, 12.1 – 12.4

Unit III : 9.1 – 9.8;

Unit IV : 15.1, 15.8, 15.9, 15.14, 15.27

Unit V : 17.1 – 17.10, 17.12 – 17.16

### Reference Books

1. Gupta.B.D., (2010), Mathematical Physics, 4<sup>th</sup> Edition, Vikas Publishing House Private Ltd.
2. Arfen.G.B , Weber.H.J&Harris.F.E (2013), Mathematical Methods for Physicists 7<sup>th</sup> Edition, Noida Elsevier India Pvt. Ltd.
3. Sathya Prakash, Mathematical Physics, S.Chand, New Delhi, 2<sup>nd</sup> Edition, 2004.

### WEBLINKS/E - Resources:

1. <http://www.youtube.com/@buvanateacher159>
2. [https://youtube.com/playlist?list=PLtyD1JlkFn3Zdwo7bIXELWQUtw1uYKIdi&si=CqhBUXSXVB\\_ki7](https://youtube.com/playlist?list=PLtyD1JlkFn3Zdwo7bIXELWQUtw1uYKIdi&si=CqhBUXSXVB_ki7)
3. <https://youtu.be/u4XYcPdpYb8?si=ojvYYHg0pOgMF7wi>
4. [https://youtube.com/playlist?list=PLU6SqdYcYsfJz9FAzbgocljkw4NXAar-&si=OVVqUtdXuzO2ZK\\_9](https://youtube.com/playlist?list=PLU6SqdYcYsfJz9FAzbgocljkw4NXAar-&si=OVVqUtdXuzO2ZK_9)
5. <https://youtu.be/fZ231k3zsAA?si=VucB2vWS-ZY-Aa8h>
6. <https://youtu.be/vvzTEbp9lrc?si=MKJeRwQd7XdxQWwK>
7. <https://youtu.be/JMjbPh1Mjn8?si=JoNArSumVEvgoaeP>
8. <https://youtu.be/rowWM-MijXU?si=IIC-QiRGkXb-FJF6>
9. <https://youtube.com/playlist?list=PLhSp9OSVmeyIADP2WgrRNsoj3OdItMqSv&si=j9dMIBODYgpAvizc>
10. [https://www.youtube.com/live/njcdN\\_-XPqc?si=7HMI5wLU6u5Nw85Y](https://www.youtube.com/live/njcdN_-XPqc?si=7HMI5wLU6u5Nw85Y)

### Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Video Making Quiz, Group Discussion

### Course Outcomes:

On completion of the course, the students will be able to

**CO1:** Elaborate the fundamentals of Vector and Scalar fields.

**CO2:** Understand the special type of matrices which are relevant to Physics.

**CO3:** Analyse the Special functions like Beta and Gamma functions.

**CO4:** Acquire knowledge on Laplace Transforms and its applications to solve simple harmonic equation.

**CO5:** Correlate measures of Central tendency and Dispersion.

**Mapping of COs with PSOs & POs:**

SEMESTER V	Subject Code:								Title of Paper: Mathematical Physics					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2		1	3	2		1	3	3	2	2	1	23
CO2	3	3		2	3	2			3	3	2	2	1	24
CO3	3	2		1	3	2		1	3	3	2	2	1	23
CO4	3	2		1	3	2		1	3	2	2	2	1	22
CO5	3	3		2	3	3			3	3	2	2	2	26
Grand total of COs with PSOs and Pos													118	
Mean value of COs with PSOs and $POs = \frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{118}{53}\right)$													2.23	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.23
Observation	<b>COs of Mathematical Physics Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**  
**Department of Physics**

**Class : B.Sc. PHYSICS**  
**Semester : V**  
**Subject Code : 22UPYC95**

**Part : III Core-9**  
**Hours : 60**  
**Credit : 4**

**DIGITAL ELECTRONICS**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives**

- To understand and examine the structure of various number systems and their applications.
- To analyse various combinational and sequential circuits.
- To explain and compare the working of multivibrators using IC 555
- To identify basic requirements and memory operations for circuit design.
- To develop skill in writing simple program for 8085 and its applications

**Unit I Number systems, codes & Arithmetic Circuits (12 hours)**

Binary number system – Binary to decimal conversion – Decimal to binary conversion – Octal numbers – Hexadecimal numbers – The ASCII code– the gray code- Binary Addition – Binary Subtraction – complements (1's, 2's, 9's and 10's) – binary addition, binary subtraction using 1's & 2's complement methods Binary Multiplication and Division – Arithmetic Building Blocks (Half Adder & Full Adder)

**Unit II Digital Principles & Combinational Logic Circuits (12 hours)**

Basic logic gates -universal logic gates (NAND & NOR)-Boolean laws and theorems – De-Morgan's theorem –standard representation of logic functions (sum of products method(SOP) & Product of sums method(POS))-Truth table to Karnaugh map 2, 3, 4 variables –Don't care condition – Multiplexers (4:1) and De-Multiplexers(1:4), – (Principles only) – encoder (8-line-to-3- line) and decoder (3-line-to-8-line) (Principles only), BCD to seven segment decoder.

**Unit III Timing Circuits and Flip flops (12 hours)**

555 Timer: Pin configuration –Block diagram-555 Timer application (Astable, Monostable) – Flip Flops: S-R Flip-flop , J-K Flip-flop, T and D type flip-flops, JK master-slave flip-flop, truth tables

**Unit IV Registers, Counters & Memory (12 hours)**

Registers: Types of Registers -Serial IN Serial OUT - Serial IN Parallel OUT - Parallel IN Parallel OUT - Parallel IN serial OUT - counters -asynchronous counter:-mod-8, mod-10, synchronous counter- 4-bit & ring counter – general memory operations, ROM, RAM (static and dynamic), PROM, EPROM, EEPROM, EAROM. IC

**Unit V Microprocessor (12 hours)**

Digital Computers – Pin configuration – Intel 8085 block diagram – Data and address bus– Intel 8085 instructions – Opcode and operands –Addressing modes -Assembly language

programmes for addition (8-Bit & 16-Bit), subtraction (8-Bit & 16-Bit), multiplication (8- Bit), division (8- Bit) – largest and smallest number in an array – BCD to ASCII and ASCII to BCD.

### **Text Books:**

1. Donald P Leach, Albert Paul Malvino, Goutam Saha, 2012, Digital Principles and Applications — Seventh Edition,– Tata McGraw Hill Education Private Limited, New Delhi  
Unit I – Ch.5: 5.1 to 5.8; Ch.6: 6.1, 6.2, 6.5, 6.7, 6.11;  
Unit II – Ch. 2: 2.1, 2.2; Ch.3: 3.1 to 3.8; Ch.4: 4.1, 4.2, 4.3, 4.6;  
Unit III – Ch.7: 7.4, 7.5; Ch.8: 8.1, 8.2, 8.4, 8.5, 8.8;  
Unit IV - Ch.9: 9.1 to 9.5,9.7; Ch.10: 10.1, 10.3,10.6;
2. Ram, 2004, Microprocessor, Dhan Pat Rai Publications, New Delhi.  
(Unit V - Chap.3 related topics).

### **WEBLINKS/E - Resources:**

1. <https://youtu.be/-paFaxtTCKI>
2. [https://youtu.be/s1DSZEaCX\\_g](https://youtu.be/s1DSZEaCX_g)

### **References:**

1. S. Salivahana & S. Arivazhagan, 2018, Digital circuits and design – Fifth Edition, Oxford University Press.
2. Malvino, 1988, Digital Principles and Applications, McGraw Hill, New Delhi.
3. Morris Mano, 2007, Computer Architecture, Pearson Education, New Delhi.
4. Aditya P.Mathur, 1984, Introduction to Microprocessor –Tata McCraw Hill, New Delhi.

### **Teaching Learning Methods:**

- Lecture Method, Demonstration, ICT, Assignment, Quiz, Group Discussion

### **Course Outcomes**

On completion of the course, the students will be able to

**CO1:** Understand and examine the structure of various number systems and their applications in digital design.

**CO2:** Analyse various combinational and sequential circuits.

**CO3:** Explain and compare the working of multivibrators using IC 555

**CO4:** Identify basic requirements for circuit design and propose a cost-effective solution.

**CO5:** Develop skill in writing simple program for 8085 and its applications

**Mapping of COs with PSOs & POs:**

SEMESTER V	Subject Code: 22UPYC95								Title of Paper: Digital Electronics					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	
CO1	3	3		3	3	3	1		3	2	3	3	3	30
CO2	3	2		3	3	3			3	3	3	2	3	28
CO3	3	3		2	3	2		1	3	3	2	3	2	27
CO4	3	2		3	3	2			3	3	3	2	2	26
CO5	3	3		2	3	3	1		3	3	2	3	2	28
Grand total of COs with PSOs and POs													139	
Mean value of COs with PSOs and POs= $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{139}{54}\right)$													2.57	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.57
Observation	<b>COs of Digital Electronics Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**

**Department of Physics**

**Class : B.Sc. PHYSICS**

**Part : III Core Elective-1**

**Semester : V**

**Hours : 45**

**Subject Code : 22UPYE15 (A)**

**Credit : 2**

**ASTROPHYSICS**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives**

- To acquire the knowledge of solar system objects, activities of sun, stars and their evolution
- To classify the galaxies and types of telescopes and its applications in astronomy
- To enlighten the knowledge on latest trends in astronomy

**Unit I Solar System**

**9 Hours**

Solar System -Motion of the Earth -Seasons -Latitudes and Longitudes –Types of Planets - Solar Eclipse -Lunar Eclipse -Asteroids and Meteoroids -Comets – Origin of moon – Lunar craters - The Sun -Internal Layers of the Sun -Atmospheres of the Sun – photosphere – chromosphere – corona.

**Unit II Solar Activities, Stars and their evolution**

**9 Hours**

-Solar Activities –sunspots – coronal holes – coronal mass ejections – solar flares – radio bursts – Sun-Earth relationship -Estimation of surface temperature of the Sun -Solar wind - Nuclear reactions in star -Properties of stars -Classification of stars -Birth of stars – Hertzsprung-Russel diagram -Main sequence stars -Life time of main sequence stars -Stellar evolution - Binary Stars - Star Clusters

**Unit IV Galaxies and Universe**

**9 Hours**

Milkyway Galaxy -Other galaxies -Types of galaxies -Galactic clusters -Cosmology -Origin of Universe -Expanding Universe -Cosmic Microwave Background -Density and Shape of Universe -White dwarf -Quasars and Neutron stars -Black hole

**Unit V Tools of Astronomy**

**9 Hours**

Introduction-Optical Telescopes – Refracting and reflecting telescopes - Comparison of Galilean and Keplerian telescopes -Image – resolving power – magnification power - Aberrations -Spectroscope -Radio Telescopes -Astronomical scales -Multiwavelength Astronomy -Comparison of optical and radio astronomy -Some optical and radio observatories in India

**Unit V Recent Developments in Astronomy**

**9 Hours**

Ground and space based telescopes - Chandrayan 3 – Aditya L1 – XPOSAT – Solar Probe – Solar Dynamic Observatory – Thirty meter telescope (TMT) – James Webb Telescope – LIGO experiment and black holes collision – Exoplanets and TESS satellite – Dark matter and Dark energy.

**Text Books:**

1. Shanmugaraju, A., 2019, Introduction to Astrophysics, Arul Anandar College, Karumathur, Madurai (Units I to IV)
2. Lecture notes (Unit V)

**References:**

1. Baidyanath Basu, 2010, An introduction to astrophysics, 2<sup>nd</sup> ed., PHI Publ.
2. Abell, Morrison and Wolf, 1995, Exploration of the Universe, &<sup>th</sup> ed., Harcourt College Publ.
3. Carrol and Ostlie, 2007, Introduction to Modern Astrophysics, 2nd ed., Pearson International.
4. Krishnaswamy, K.S. 1996, Astrophysics- A modern perspective, New Age International.

**WEBLINKS/E - Resources:**

1. <https://www.space.com/26218-astrophysics.html>
2. <https://web.astro.princeton.edu/academic/undergraduate-program/introduction-astrophysics>
3. <https://www.secretsofuniverse.in/basics-of-astrophysics-sou/>

**Teaching Learning Methods:**

- Lecture Method, Models, ICT, Assignment, Quiz, Group Discussion

**Course Outcomes**

On completion of the course, the students will be able to

**CO 1:** Acquire the knowledge of solar system and occurrence of seasons on the earth.

**CO 2:** Describe the effects of solar activities on the Earth, properties and evolution of stars.

**CO 3:** Discuss the structure of milky way and various types of galaxies.

**CO 4:** Classify the tools of astronomy and the types of telescopes.

**CO 5:** Acquire the knowledge about recent developments in astronomy

**Mapping of COs with PSOs & POs:**

SEMESTER V	Subject Code:								Title of Paper: ASTROPHYSICS					Sum of COs with PSOs and POs
	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	3		2	3	2			3	3	3	2	2	25
CO2	3	3		3	3	2			3	3	3	2	1	26
CO3	2	3		3	3	2			2	2	3	1	2	23
CO4	3	3		3	3	2		1	3	1	3	1	2	25

CO5	3	3		3	3	2			3	1	3	2	1	24
Grand total of COs with PSOs and POs														123
Mean value of COs with PSOs and $POs = \frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left( \frac{123}{51} \right)$														2.41

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.41
Observation	<b>COs of Astrophysics Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**  
**Department of Physics**

**Class : B.Sc. Physics** **Part : III Core Elective - 1**  
**Semester : V** **Hours : 45**  
**Subject Code : 22UPYE15 (B)** **Credit : 2**

**INFORMATION TECHNOLOGY**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives**

- To acquire the knowledge of Computer Networks, Internet and their applications.
- To understand the basics of World wide web, Mobile computing and Email.
- To enlighten the knowledge on latest trends in Information Technology.

**UNIT – I: Introduction to Computer Networks (9 hours)**

Introduction – Types of Computer Networks – Local Area Networks (LAN) – Wide Area Networks (WAN) – Gateways (Routers) – Repeaters – Bridges – Networking Topologies – Star Topology – Ring Topology – Bus Topology – Mesh Topology – Mesh Topology – Tree Topology.

**UNIT – II: Internet & World Wide Web (9 hours)**

Introduction – Client and Servers – Host and Terminals – TCP/IP – World Wide Web (WWW) – Hypertext – Uniform Resource Locator (URL) – Web Browsers – IP Address – Domain Name – Domain Name Service (DNS) – Internet Service Providers (ISP) – Internet Security.

**UNIT – III: Mobile Computing (9 hours)**

Introduction – Wireless Application Protocol (WAP) – Architecture – WAP Internal Structure – Wireless Session Layer – Wireless Transaction layer – Bearers – GSM – CDMA – Mobile Data Transmissions using 2G, 3G, 4G and 5G Technology.

**UNIT – IV: Electronic Mail & IT Applications (9 hours)**

Introduction – Email – History of Email – Impact of Email – Email Technologies – Email Securities – Cloud Storage – MS Office 365 & Google Suite – Web Conferencing – Online Chat – Online Training & Online Classes.

**UNIT – V: Emerging Technologies in IT (9 hours)**

Introduction – Human Computer Interface – Virtual Reality (VR) – Big Data – Artificial Intelligence (AI) – Natural Language Processing – Machine Learning – Deep Learning – Internet of Things (IOT) – Cyber Security – Hacking – Ethical Hacking – Career opportunities in Information Technology.

### **Book for Study**

1. Deepak Bharihoke (2000), *Fundamentals of Information Technology* - 3<sup>rd</sup> Edition, Excel Books, New Delhi.

Unit 1: Chapter 17 (Relevant topics)

Unit 2: Chapter 18 (Relevant topics)

Unit 3: Chapter 19 (Relevant topics)

Unit 4: Chapter 20 (Relevant topics) & Lecture Notes

Unit 5: Study Material & Lecture Notes

### **Books for Reference:**

1. Alexis Leon and Mathews Leon (2009), *Fundamentals of Information Technology* – 2<sup>nd</sup> Edition, Leon Vikas Publishing House Pvt Ltd., Noida.
2. Shambhavi Roy, Clinton Daniel, and Manish Agrawal (2023), *Fundamentals of Information Technology* - Digital Commons @ University of South Florida, [https://digitalcommons.usf.edu/dit\\_tb\\_eng/19](https://digitalcommons.usf.edu/dit_tb_eng/19).
3. Peter Norton (2011), *Introduction to Computers* – 7<sup>th</sup> Edition, Tata McGraw – Hill Education Pvt Ltd., New Delhi.

### **Weblinks/E - Resources:**

1. <http://www.mhhe.com/peternorton>.
2. [https://digitalcommons.usf.edu/dit\\_tb\\_eng/19](https://digitalcommons.usf.edu/dit_tb_eng/19).
3. <https://www.telecomtrainer.com/mobile-network-2g-3g-4g-5g/>
4. <https://developer.ibm.com/articles/cc-beginner-guide-machine-learning-ai-cognitive/>

### **Course outcomes**

On completion of the course, the students will be able to

**CO 1:** Describe the computer networking basics.

**CO 2:** Explain the fundamentals of Internet & World Wide Web.

**CO 3:** Acquire knowledge on the mobile computing.

**CO 4:** Understand the concepts of email and applications of IT.

**CO 5:** Elucidate the future emerging technologies & career opportunities in IT.

Mapping of COs with PSOs & POs:

SEMESTER V	Subject Code: 22UPYE15 (B)								Title of Paper: INFORMATION TECHNOLOGY					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	1	1	1	2	2	1	1	2	1	3	1	3	22
CO2	3	2	1	3	3	2			3	2	3	1	3	26
CO3	3	3	1	2	3	2			3	2	2	2	2	25
CO4	3	2	2	3	3	2			3	2	2	3	2	27
CO5	3	2	2	2	1	3		1	2	2	3	2	3	26
Grand total of COs with PSOs and POs														126
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{126}{52}\right)$														2.42

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.42
Observation	<b>COs of INFORMATION TECHNOLOGY Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**

**Department of Physics**

**Class : B.Sc. PHYSICS Part : III Self Learning Course**  
**Semester : V Hours :**  
**Subject Code : 22UPYSL5 Credit : 3**

**THIN FILM SCIENCE**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives**

- To understand the growth mechanism of thin films
- To study the preparation of various thin films by physical and chemical deposition methods
- To examine the structural, optical and electrical properties of thin films
- To examine the morphological, elemental and mechanical properties of thin films
- To discuss the use of thin films in different industrial applications.

**Unit -I Introduction**

Introduction-Advantages of thin film devices over their bulk counterparts-Thin film growth stages-Applications of thin films-Certain important properties of thin films-Thickness-Density-Structural properties-Optical properties-Electrical properties-Surface morphological properties-Compositional properties-Magnetic properties-Mechanical properties-Epitaxial films

**Unit-II Thin Film Deposition Techniques**

Introduction-Physical deposition methods-Vacuum evaporation technique- Thermal evaporation

Electron beam evaporation (EBE)-Pulsed laser deposition (PLD -Sputter deposition process-Chemical vapor deposition (CVD)- Chemical bath deposition (CBD)-Successive ionic layer adsorption and reaction (SILAR) - Spray pyrolysis technique Sol-gel spin coating technique

**Unit-III Characterization Techniques-I**

Characterization of thin films -Thickness of thin films-Weight gain method-Surface profilometry (or) Stylus technique-Optical interference method-Multiple beam interferometry method- Ellipsometry-Measurement of density-Structural properties-X-ray diffractometry (XRD)-Optical properties-UV-vis- NIR double beam spectrophotometry-Photoluminescence (PL) spectroscopy-Electrical properties-Four point probe technique-van der Pauw technique-Hall effect measurement

**Unit-IV Characterization Techniques-II**

Surface morphological properties-Scanning electron microscopy (SEM)- Atomic force microscopy (AFM)-Transmission electron microscopy (TEM)- Scanning tunnelling microscopy (STM)- Compositional properties- Energy dispersive analysis of X-ray (EDAX)- X-ray photo electron spectroscopy (XPS)- Auger electron spectroscopy (AES)- Rutherford back scattering

spectroscopy (RBS)- Fourier transform infrared (FTIR) spectroscopy - Raman spectroscopy- Magnetic properties- Vibrating sample magnetometer (VSM)- Superconducting quantum interference device- (SQUID) magnetometer- Mechanical properties-Hardness test

### Unit-V Applications

Introduction-Thin films in photo-voltaic (PV) technologies-Dye sensitized solar cells-Thin film based gas sensors-films in disinfectant technologies-as antibacterial agents-as photocatalysts- Bio- medical uses- Magnetic films for data storage applications – Spintronics- Thin film resistors, thermistors and capacitors- film strain gauge elements- Functional / Decorative coatings- Transparent conducting oxide (TCO) thin films- Electrical and optical properties of TCOs- Quality factor (Figure of merit) of TCO films- Pre-requisites for good TCOs- Applications of TCOs- Emerging applications of TCOs

### Reference books

1. Introduction to Thin films, K. Ravichandran, K. Swaminathan, B. Sakthivel, Research India publications, New Delhi, (2013).
2. Nanocoatings and Ultra-Thin Films: Technologies and Applications, 1st Edn., A.S.H. Makhoulf and I. Tiginyanu, Woodhead Publishing, (2011).
3. Thin Film Fundamentals: A. Goswami-New age International, 2007.
4. Thin Film Phenomena, K. L. Chopra, McGraw Hill Inc. (1969)

### Weblinks/E - Resources:

1. <https://www.sciencedirect.com/topics/materials-science/thin-films>

### Teaching Learning Methods:

- Self - learning, Discussion

### Course Outcomes

On completion of the course, the students will be able to

**CO1:** Describe the growth mechanism of thin films

**CO2:** Illustrate the preparation of various thin films by chemical deposition methods

**CO3:** Explain the growth of various thin films by physical deposition methods

**CO4:** Analyze the properties of thin films using different instruments

**CO5:** Discuss the use of thin films in different industrial applications.

### Mapping of COs with PSOs & POs:

SEMESTER V	Subject Code: 22UPYSL5								Title of Paper: THIN FILM SCIENCE					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2		2	1	2	1		3	3	3	2	3	25
CO2	3	1		3	2	2			3	2	3	3	2	24
CO3	2	2		2	2	3			3	2	3	3	3	25

CO4	3	2		2	2	3			3	2	3	3	3	26
CO5	3	2		2	2	3			3	2	3	3	3	26
Grand total of COs with PSOs and POs													126	
Mean value of COs with PSOs and $POs = \frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left( \frac{126}{51} \right)$													2.47	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.47
Observation	<b>COs of Thin Film Science Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**

**Department of Physics - B.Sc. (Physics) Syllabus**

<b>Class</b>	<b>: III year</b>	<b>Part</b>	<b>: III Core -10</b>
<b>Semester</b>	<b>: VI</b>	<b>Total hours</b>	<b>: 75</b>
<b>Code</b>	<b>: 22UPYD06</b>	<b>Credit</b>	<b>: 5</b>

**CLASSICAL, STATISTICAL & RELATIVISTIC MECHANICS**  
**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Objectives:**

- To understand the mechanics of system of particles and to deduce the equations of motion of Lagrangian
- To analyse Hamilton equation by comparing it with Lagrangian and to use it in some applications
- To acquire knowledge in classical and quantum statistical mechanics and to compare all the three statistics
- To elaborate different frames and to interpret the ideas of special theory of relativity
- To study the concept of mass-energy equivalence and general theory of relativity

**Unit 1 Mechanics of a System of Particles & Lagrangian Formulation (15 hours)**

External and Internal force, Centre of Mass – Conservation of Linear momentum – Conservation of Angular momentum – Conservation of Energy (K.E., P.E.) - Constraints – Generalized Coordinates (Transformation Equations)

Principle of Virtual Work – D'Alembert's Principle - Lagrangian Equations from D'Alembert's Principle (Derivation) – Applications (Simple Pendulum, Atwood's Machine, Compound Pendulum), Lagrangian Equations in presence of Non-Conservative force.

**Unit 2 Hamiltonian Formulation (15 hours)**

Hamiltonian Function H and Conservation of energy (Jacobi's Integral) – Physical significance, Hamilton's Equations (Derivation) – Hamilton's equations in different coordinate system (Cartesian) - Applications (Harmonic oscillator, motion of a particle in central force field, Compound Pendulum).

**Unit 3 Statistical Mechanics (15 hours)**

Introduction - Phase space – Maxwell Boltzmann Distribution – Molecular Energies in an Ideal Gas Law – Maxwell Boltzmann Velocity Distribution Law – Quantum Statistics - Bose Einstein Distribution Law (Derivation only) – Fermi Dirac Distribution Law (Derivation only) – Comparison of the Three Distribution Laws.

**Unit 4 Relativistic Mechanics I (15 hours)**

Concept of Space, Time and Mass - Frame of Reference – Newtonian Relativity - Galilean Transformation – Ether Hypothesis – Michelson and Morley Experiment – Explanation of Negative Result - Postulates of Special Theory – Lorentz Transformation Equations – Length Contraction – Time Dilation – Meson Decay – Relativity of Simultaneity.

**Unit 5 Relativistic Mechanics II (15 hours)**

Addition of Velocities – Variation of Mass with Velocity – Mass Energy Equivalence – Minkowski's Four Dimensional Space - Time Continuum - The General Theory of

Relativity – Postulates – Predictions of General Relativity – Deflection of Light in a Gravitational Field – Advance of the Perihelion of Mercury's Orbit – Gravitational Red Shift.

**Text Books:**

1. J.C. Upadhyaya, July 2005, Classical Mechanics, Published by Himalaya Publishing House, Mumbai  
Unit1: 1.7.1, 1.7.2, 1.7.3, 1.7.5, 1.7.8- (a, b, c), 2.3 (2.3.1, 2.3.2), 2.4, 2.5, 2.6, 2.7, (Example 2, 3, 5), 2.9  
Unit2: 3.4, 3.5, 3.6 (1), 3.7 (1, 2, 4)
2. Murugesan, R. & Kiruthiga Sivaprasath, 18e, 2019, Modern Physics, S. Chand and Co., New Delhi.  
Unit 3: 43.1, 43.2, 43.6, 43.7 (Derivation only), 43.8 (Derivation only), 43.9  
Unit 4: 1.1 -1.11  
Unit 5: 1.12 – 1.17

**References:**

1. Gupta, B.D., Satyaprakash, 1991, Classical Mechanics, 9th ed., Ka dernath Ramnath Publ., Meerut
2. Gupta, Kumar, Sharma, 2005, Classical Mechanics, Pragati Prakashan Publ., Meerut.
3. Murray R. Spiegel, 1981, Theoretical Mechanics, Schaum's outline series, Mc Graw Hill Publ. Co., New Delhi.
4. Goldstein, 2001, Classical Mechanics, II Edition, Narosa Publishing Co.
5. B.K. Agarwal and Melvin Eisner, 2023, Statistical Mechanics – New Age International Publ.
6. Brijlal, Subramaniam & Hemne, 2008, Heat & Thermodynamics, S. Chand & Company.
7. French, A.P., 1968, Special theory of relativity, Van Nostran Rainhold Company.

**Weblinks/E - Resources:**

1. <https://epgp.inflibnet.ac.in/> - (Classical Mechanics)
2. <https://web.mst.edu/~sparlin/phys107/lecture/chap09.pdf> - (Statistical Mechanics)
3. <https://www.shobhituniversity.ac.in/pdf/econtent/Relativistic-Mechanics-Dr-R-K-Jain.pdf> - (Relativistic Mechanics)

**Course Outcomes**

On completion of the course, students should be able to

- CO 1:** Understand the concepts of forces, conservation theorems, constraints and to deduce the equations of motion in Lagrangian
- CO 2:** Deduce the equations of motion in Hamiltonian and solve some applications
- CO 3:** Derive the statistical distribution functions, compare the three statistics and analyse their applications
- CO 4:** Analyze the motion of different bodies in different frames of reference and interpret the ideas of special theory of relativity

**CO 5:** To acquire knowledge in general theory of relativity and understand gravitational red shift

**Mapping of COs with PSOs & POs:**

SEMESTER IV	Subject Code: 22UPYD06								Title of Paper: Classical, Statistical and Relativistic Mechanics					
	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3		2	3	3			3	3	3	2	2	27
CO2	3	3		1	3	3			3	2	3	2	2	25
CO3	3	3		2	3	3			3	2	3	2	2	26
CO4	3	3		3	3	3			3	2	3	2	2	27
CO5	3	3		3	3	3			3	2	3	3	2	28
Grand total of COs with PSOs and POs													133	
Mean value of COs with PSOs and $POs = \frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{133}{50}\right)$													2.66	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.66
Observation	<b>COs of Classical, Statistical and Relativistic Mechanics Strongly related with PSOs and POs</b>		

Arul Anandar College (*Autonomous*), Karumathur

Department of Physics

Class : B. Sc. PHYSICS

Part : III Core -11

Semester : VI

Hours : 75

Subject Code : 22UPYD16

Credit : 5

**NUCLEAR PHYSICS**

(For Students admitted from the Academic Year 2022-2023 onwards)

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**Course Objectives:**

To understand constituents, properties and models of nucleus.

To give reason for radioactivity and study their properties.

To learn about the principles of various particle detectors and accelerators.

To acquire knowledge on different types of nuclear reactions and their applications.

To know the reason for cosmic rays and their effect on the surface of earth and also understand the classification of elementary particles.

**Course Outline:**

**Unit - I**

**(15 hours)**

**Properties of Nucleus & Nuclear Models:**

constituents of nucleus – classification of nuclei – general properties of nucleus – binding energy – nuclear stability – theories of nuclear composition – meson theory of nuclear forces.

liquid drop model – applications of semi-empirical mass formula – shell model.

**Unit - II**

**(15 hours)**

**Radio activity:**

radio activity – properties of alpha, beta and gamma rays – range of  $\alpha$ -particles - Gamow's theory of  $\alpha$ -decay (qualitative) –  $\beta$ -ray spectrum – neutrino theory of beta decay – detection of neutrino - laws of radioactive disintegration, (only final formulae) – units of radioactivity - Law of successive disintegration.

**Unit - III**

**(15 hours)**

**Particle Detectors and Accelerators:**

ionization chamber - solid state detectors – proportional counter - Geiger-Muller counter – Wilson cloud chamber - bubble chamber - scintillation counter.

linear accelerators – cyclotron – betatron – synchrotron – proton synchrotron (bevatron).

**Unit - IV**

**(15 hours)**

**Nuclear Reactions:**

Q-value equation for a nuclear reaction – threshold energy - types of nuclear reactions – conservation laws in nuclear reaction – nuclear transmutations - nuclear fission – energy released in fission – chain reaction – critical mass – nuclear reactor – nuclear fusion – sources of stellar energy – thermonuclear reactions.

**Unit - V**

**(15 hours)**

**Cosmic Rays and Elementary Particles:**

latitude effects - altitude effect - primary and secondary cosmic rays – cosmic ray showers - discovery of positron – Van-Allen belts.

particles and antiparticles – types of fundamental interactions – quantum numbers of elementary particles – conservation laws and symmetry – quarks and types – quark model (elementary ideas only).

### Text Books:

R Murugesan & Kiruthiga Sivaprasath, (2019) Modern Physics, S. Chand & Co. 18<sup>th</sup> ed, New Delhi.

<b>Unit I</b>	:	17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7.1, 17.10, 17.11, 17.12
<b>Unit II</b>	:	20.1, 20.4, 20.8, 20.10, 20.10.2, 20.10.3, 20.18, 20.19, 20.20
<b>Unit III</b>	:	18.3, 18.4, 18.5, 18.6, 18.7, 18.8, 18.10, 19.2, 19.3, 19.5, 19.6, 19.7
<b>Unit IV</b>	:	21.2, 21.2.3, 21.2.4, 21.3, 22.1, 22.1.1, 22.2, 22.3, 22.6, 22.6.1, 22.6.2
<b>Unit V</b>	:	23.1, 23.3, 23.4, 23.5, 23.7, 23.9, 24.2, 24.4, 24.5, 24.6, 24.7

### References:

- 1) Basic ideas and concepts in Nuclear Physics, K.Heyde, (2004), 3<sup>rd</sup> Edn., Institute of Physics Pub.
- 2) Nuclear Physics, Tayal, D.C., (1995) Himalaya Publishing House.
- 3) Introductory nuclear Physics, Kenneth S. Krane, (2008), Wiley India Pvt. Ltd.
- 4) Radiation detection and measurement, G.F. Knoll, (2000), John Wiley & Sons.
- 5) Theoretical Nuclear Physics, J.M. Blatt & V. F. Weisskopf (1991), Dover Pub. Inc.
- 6) Elements of Nuclear Physics, M.L. Pandya, R.P.S. Yadav, Amiya Dash, (2020), Kedar Nath Ram Nath,
- 7) Introduction to High Energy Physics, D.H. Perkins, (2000), Cambridge University Press; 4<sup>th</sup> edition
- 8) Introduction to Elementary Particles, D. Griffith, (2008), John Wiley & Son

### Web Resources

- 1) <http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>
- 2) <https://makingphysicsfun.files.wordpress.com/2015/01/photoelectric-effect.pptx>
- 3) <https://www.khanacademy.org/science/in-in-class-12th-physics-india/nuclei>
- 4) <http://hyperphysics.phy-astr.gsu.edu/hbase/nuccon.html>
- 5) <https://www.kent.edu/physics/nuclear-physics-links>
- 6) <https://www2.lbl.gov/abc/links.html>

### Teaching Learning Methods:

Lecture Method, ICT, Assignment, Quiz, Group Discussion

### Course Outcomes:

On completion of the course, the students will be able to

CO1: Understand the basic nuclear properties and applications of NMR.

CO2: Enumerate the different nuclear models.

CO3: Acquire the knowledge of Particle accelerators & Detectors.

CO4: Explain various nuclear reactions and properties of neutron.

CO5: Gain the basic knowledge of nuclear energy and elementary particles

**Mapping of COs with PSOs & POs:**

SEMESTER VI	Subject Code:22UPYD16								Title of Paper: Nuclear Physics					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3		3	3	2			3	3	2	2	2	26
CO2	3	2		2	3	2			1	2	2	1	2	20
CO3	3	2		3	3	2			3	3	3	2	2	26
CO4	3	2		1	3	2			3	3	1	2	2	22
CO5	3	3		3	3	2		1	3	3	2	1	2	26
Grand total of COs with PSOs and POs													120	
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{120}{51}\right)$													2.35	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.35
Observation	<b>COs of Nuclear Physics Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**  
**Department of Physics**

**Class : B.Sc. PHYSICS**  
**Semester : VI**  
**Subject Code : 22UPYD26**

**Part : III Core -12**  
**Hours : 75**  
**Credit : 5**

**SOLID STATE PHYSICS**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives**

- To understand the basics of crystal structure of various materials.
- To appreciate the correlation between bonding and the properties of solids and free electron in metals.
- To discuss the properties of dielectric materials
- To acquire knowledge on magnetism and magnetic materials.
- To classify the types of superconductors and their applications

**Unit 1 Bonding in solids & Elements of Crystallography (15 hours)**

Interatomic Forces and Cohesive Energy - Different Types of Bonds in Solids – Lattice Energy of Cohesive Energy of Ionic Crystals - Some Fundamental Definitions in Crystallography - Miller indices - Lattice Parameters of Unit Cell – Bravais lattices - Crystal Structures of Important Engineering Materials and Stacking Sequences - Other important structures (diamond, Zinc blende, NaCl, CsCl) - Polymorphism and Allotropy.

**Unit 2 Electron theory of metal & Thermal Properties of Solids (15 hours)**

Classical free electron theory –Electrical conductivity of a metal (based on Drude-Lorentz theory) – derivation of Ohm's law –thermal conductivity – Weidemann-Franz' law -Dulong and Petit's Law – specific heat of solids - Einstein and Debye theories of specific heat of solids –  $T^3$  law (qualitative only)

**Unit 3 Dielectric Properties (15 hours)**

Fundamental definitions in di electrics – Different types of electric polarisation: electronic polarisation– calculation of polarisability – ionic, orientational and space charge polarization – dielectric loss –frequency dependence of dielectric constant -local field– Clausius-Mosotti relation

**Unit 4 Magnetic properties (15 hours)**

Origin of Magnetic Moment in Magnetic Materials - Magnetic Quantities - Different Types of Magnetic Material - Langevin Theory of Paramagnetism - Weiss Theory of Paramagnetism - Weiss Theory or Molecular Field Theory of Ferro Magnetism.

**Unit 5 Superconductivity (15 hours)**

Explanations for the Occurrence for Superconductivity-General Properties of Superconductors -Other General Observations-Types of Superconductors-High Temperature Superconductors-Single Particle Tunneling-Josephson Effect (AC & DC)-Applications of Superconductors.

**Text Books:**

1. Arumugam, M, 2004, Solid State Physics, Anuratha Agencies, Kumbakonam.  
(Unit I – Chap.1 Secs.1.1 – 1.4, Chap 2- Secs 2.1 – 2.6.  
Unit II - Chap.6 Secs. 6.1 – 6.3, 6.9-6.11  
Unit III – Chap.7 Secs. 7.1 – 7.8  
Unit IV – Chap.8 Secs. 8.1 – 8.8 (8.7.1. excluded)  
Unit V – Chap.10 Secs. 10.1 – 10.5.1, 10.10 – 10.12
2. Murugesan, R., 2003, Modern Physics, S. Chand and Company, New Delhi.  
Unit II– Chap.16 Secs.16.10 – 16.12

**Weblinks/E - Resources:**

1. <https://nptel.ac.in/courses/115105099/>
2. <https://nptel.ac.in/courses/115106061/>

**References:**

1. Solid state Physics, Rita John, 1st edition, TataMcGraw Hill publishers (2014).
2. Solid State Physics , R L Singhal, Kedarnath Ram Nath & Co., Meerut (2003)
3. P.K.Palanisamy, 2003, Solid State Physics, SCITECH Publ.
4. S.O.Pillai, 2005, Solid State Physics, New Age International.
5. Charles Kittel, Solid State Physics, 2005, Wiley Publishers.

**Teaching Learning Methods:**

- Lecture Method, Models Display, ICT, Assignment, Quiz, Group Discussion

**Course Outcomes**

On completion of the course, the students will be able to

**CO1:** Understand the bonding with the properties of solids and crystal systems and structure of various materials.

**CO2:** Correlate the energy-level spacing of a free electrons in metals and Thermal Properties of Solids

**CO3:** Identify the dielectric materials and their properties

**CO4:** Acquire knowledge on magnetism and magnetic materials.

**CO5:** Analyze the types of superconductors and their applications.

**Mapping of COs with PSOs & POs:**

SEMESTER VI	Subject Code: 22UPYD26								Title of Paper: Solid State Physics					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3		3	3	2			3	3	3	2	2	27
CO2	3	2		3	3	3			3	3	3	2	1	26
CO3	3	3		1	3	3		1	3	3	2	3	2	27
CO4	3	2		3	3	3			3	3	3	3	2	28
CO5	3	3		2	3	2			3	3	3	3	2	27
Grand total of COs with PSOs and POs													135	

<p>Mean value of COs with PSOs and  <math display="block">POs = \frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{135}{51}\right)</math></p>	2.65
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Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.65
Observation	<b>COs of Solid State Physics Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**  
**Department of Physics**

**Class : B.Sc. Physics**

**Part : III Core-13**

**Semester : VI**

**Hours : 60**

**Subject Code : 22UPYD36**

**Credit : 4**

**NANOPHYSICS**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives:**

- To understand the basics of Nanomaterials, Classification and its properties.
- To discuss the various types of quantum materials, Nanotubes and nanostructures.
- To explain different techniques of preparation of nano materials and their advantages.
- To illustrate nanomaterial characteristic tools and its basic concepts.
- To describe the applications of nanomaterials in various fields.

**Unit 1: Introduction to Nanotechnology and Nanomaterials (12 Hours)**

History of nanotechnology – Classification of Nanomaterials – Properties of Nanomaterials – Effects of surface area to volume ratio on the properties of materials – Applications of Nanomaterials – Challenges in nanotechnology- Nanomaterials-Quantum dots – Quantum wires – Quantum well – Fullerenes – Buckminster fullerene – Carbon nanotubes- Nanocomposites – Nanohybrids – Nanoclusters and Nanoparticles

**Unit 2: Preparation of Nanomaterials (12 Hours)**

Top down and bottom up approaches – Top down techniques: Ball Milling – Etching – Nanolithography – Photolithography – Combustion synthesis. Bottom up techniques: Vacuum evaporation technique – Sputter deposition process – Laser ablation – Co-precipitation process – Hydro-thermal method – Sol-gel synthesis.

**Unit 3: Structural, morphological and compositional Characterization Techniques**

**(12 Hours)**

X-ray Diffraction: Principle – Instrumentation – Determination of structural parameters. Scanning electron microscope (SEM) – Atomic Force Microscope (AFM)- Scanning tunnelling Microscope (STEM)-Transmission electron microscope (TEM) –Energy Dispersive X-ray Analysis (EDAX) – X-Ray Photoelectron spectroscope (XPS)- -Raman Spectroscope

**Unit 4: Optical and Magnetic Characterization Techniques**

**(12 Hours)**

Fourier Transform infrared (FTIR) spectroscope-UV-Vis spectroscopy: Some important optical parameters (Absorption coefficient, Optical band gap, Extinction coefficient – Photoluminescence (PL) spectroscopy-Magnetic characterization-introduction-Super conducting Quantum interface Device (SQUID) magnetometer-Vibrating sample magnetometer

## Unit 5: Applications of Nanomaterials

(12 Hours)

Nanoelectronics – Molecular electronics – Nanophotonics – Nanorobotics – Nano mechanics–Biomedical applications: Targeted drug delivery – Cancer therapy – Targeted chemotherapy – Radiation Therapy – Thermo therapy – Immunotherapy – Photodynamic therapy – Anti-angiogenic therapy – Gene therapy – Tissue engineering – Biosensing – Bioimaging.

### Text Book:

1. Dr. K. Ravichandran, Dr.K. Swaminathan, Dr. P.K. Praseetha, Dr. P. Kavitha, Introduction of Nanotechnology, JAZYM Publications, Trichy, India, (2019)  
[Unit 1 - Chapter 1: 1.1 – 1.7, 2.1-2.7, 2.9-2.11  
Unit 2 - Chapter 3.1, 3.2, 3.3 (3.3.1, 3.3.2,3.3.3 (only relevant titles),3.3.4), 3.4(3.4.1-3.4.6)  
Unit 3 – Chapter 4: 4.1, 4.2 (4.2.1), 4.6, Chapter 5: 5.2, 5.3, 5.4, 5.5 Chapter 6: 6.2, 6.3, 6.5, 6.6  
Unit 4 - Chapter 7: 7.1, 7.2, 7.3, 7.4, Chapter 8.1, 8.2, 8.3  
Unit 5 -Chapter 9: 9.1-9.6, 9.12-9.12.1-9.12.6]

### Books for reference:

1. Introduction to Nanotechnology, Charles P.Poole Jr., Frank J. Owens, Wiley – India (2008).
2. Introduction to Nanoscience and Nanotechnology, K.K. Chattopadhyay and A.N. Banerjee – PHI Learning Pvt. Ltd (2009)
3. Nano: The Essentials – T. Pradeep, McGraw-Hill Education.
4. Nanotechnology and Nanoelectronics, W.R.Fahrner (Ed.), Springer (2008)
5. Exploring Nanomaterials, R.Pazhani, Pooja publishers, Ethamozhy (2009).

### Weblinks/E - Resources:

1. <https://phys.org/nanotech-news/nano-physics/>
2. [https://serc.carleton.edu/msu\\_nanotech/nano\\_intro.html](https://serc.carleton.edu/msu_nanotech/nano_intro.html)
3. <https://www.technology.org/2019/08/03/introduction-to-nanotechnology-basic-concepts-explained/>
4. <https://education.nationalgeographic.org/resource/nanotechnology/>

### Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, Group Discussion

### Course Outcomes:

On completion of the course, the students will be able to

**CO1:** Acquire the knowledge of nanomaterials and their properties

**CO2:** Elucidate and compare various quantum confinements and nanotubes

**CO3:** Describe the preparation of nano materials using different techniques

**CO4:** Analyse different characteristics of nanomaterials.

**CO5:** Classify the various applications of nanomaterials.

### Mapping of COs with POs and PSOs

SEMESTER VI	Subject Code: 22UPYD36								Title of Paper: NANOPHYSICS					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3		3	2	2			3	3	3	3	3	28
CO2	3	2		2	3	2			3	3	2	3	3	26
CO3	3	3		3	2	2		1	3	3	3	3	3	29
CO4	3	2		2	2	2			3	3	2	3	2	24
CO5	3	3		3	3	2			3	3	3	3	3	29
Grand total of COs with PSOs and POs													136	
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{136}{51}\right)$													2.67	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.67
Observation	COs of Nanophysics Strongly related with PSOs and POs		

**Arul Anandar College (Autonomous), Karumathur**

**Department of Physics**

**Class : B.Sc. PHYSICS**

**Total hours : 90**

**Semester : V & VI**

**Credit : 3**

**Subject Code : 22UPYP36**

**Hours/Week : 3**

**PHYSICS LAB – III (General)**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives**

- To determine certain physical properties through optical experiments
- To carry out the electrical experiments to find and compare the inductance of coils, impedance, emf and capacitances.
- To construct electrical circuits to measure the thermo emf, temperature coefficient and to find the resonance frequency characteristics.
- To perform ballistic & tangent galvanometer experiments to study the electric and magnetic parameters
- To determine the dielectric constants of air, solid and liquid.

**Any 15 of the following list of experiments:**

1. Determination of thickness of a wire by Air wedge
2. Determination of wavelength of light using Hartmann's interpolation formula - spectrometer
3. Determination of refractive index of material using small angle prism - spectrometer
4. Determination of self-inductance of a coil by Owen's bridge
5. Determination of self-inductance of a coil by Anderson's bridge
6. Determination of emf of a thermocouple by Potentiometer
7. Determination of temperature coefficient of resistance Potentiometer
8. Determination of Impedance and power factor – LR circuit
9. Conversion of Galvanometer in to ammeter
10. Conversion of Galvanometer in to voltmeter
11. Comparison of emf of two cells by B.G.
12. Comparison of capacitances by B.G.
13. Determination of absolute capacitance by B.G.
14. Determination of mutual inductance by B.G.
15. Determination of Horizontal component of Earth's magnetic field – Tangent Galvanometer
16. Study of B-H Hysteresis Curve
17. Determination of resonance frequency of LCR – series resonance circuit
18. Determination of resonance frequency of LCR – Parallel resonance circuit
19. Determination of Dielectric constants of air, solid and liquid
20. Verification of Brewster's law – Polarization
21. Determination of Thickness of a thin film of Bi-prism

22. Determination of Refractive Index - Double refraction ( $\mu_e$  and  $\mu_o$ )
23. Determination of Rydberg's constant – Hydrogen Spectra.
24. Determination of Planck's constant using photo diode

#### Teaching Learning Methods:

- Lecture Method, Demonstration, ICT, Hands-on session.

#### Course Outcomes

On completion of the course, the students will be able to

- CO 1:** Perform optical experiments to determine the thickness of a thin wire and Biprism, optical parameters such as Refractive index, Planck's constant & Rydberg's Constant.
- CO 2:** Carry out the electrical experiments to calculate the self-inductance of coils, impedance and power factor.
- CO 3:** Construct electrical circuits to measure the thermo emf, temperature coefficient and resonance frequency.
- CO 4:** Illustrate the working of ballistic & tangent galvanometer and to study the electric and magnetic parameters
- CO 5:** Determine the dielectric constants of air, solid and liquid.

#### Mapping of COs with PSOs & POs:

SEMESTER V & VI	Subject Code: 22UPYP36								Title of Paper: PHYSICS LAB – III (General)					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3		2	3	2			3	2	3	2	3	26
CO2	3	3		3	3	3			3	3	3	2	3	29
CO3	3	3		2	3	1			3	3	3	1	2	24
CO4	3	3		3	3	2			3	2	3	2	3	27
CO5	3	3		3	3	2			3	3	3	2	3	28
Grand total of COs with PSOs and POs													134	
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{134}{50}\right)$													2.68	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.68
Observation	<b>COs of Physics Lab – III (General) Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**

**Department of Physics**

<b>Class</b>	<b>: B.Sc. PHYSICS</b>	<b>Hours</b>	<b>: 90</b>
<b>Semester</b>	<b>: V &amp; VI</b>	<b>Credit</b>	<b>: 3</b>
<b>Subject Code</b>	<b>: 22UPYP46</b>	<b>Hours/Week</b>	<b>: 3</b>

**PHYSICS LAB – IV (Electronics)**

**(For Students admitted from the Academic Year 2022-202 on3wards)**

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**Course Objectives:**

- To study the various characteristics & applications of operational amplifier IC 741.
- To construct and determine the bandwidth using single stage and two stage amplifiers.
- To construct multivibrators and compare the theoretical and experimental frequency.
- To execute the arithmetic operations of 4 bit and 8-bit microprocessor kit.
- To analyse and verify the various logic gates and theorems.

**Any 14 of the following list of experiments:**

1. Study of V-I characteristics of UJT
2. Study of Frequency response curve study of two stage amplifier with feedback
3. Study of Frequency response curve study of two stage amplifier without feedback
4. Construction of Clippers and clampers using diode and CRO
5. Construction of Colpitt's oscillator using transistor.
6. Construction of Monostable multivibrator using transistor
7. Construction of Schmitt trigger using IC 555
8. Construction of Astable multivibrator using transistor
9. Construction of 5V, IC Regulated power supply
10. Study of V-I characteristics of Opamp – IC 741
11. Construction of differentiator and integrator using Opamp – IC 741
12. Construction of adder and subtractor using Opamp – IC 741
13. Construction of Logic gates using discrete components
14. Construction of Logic gates using ICs
15. Construction of Logic gates – using IC universal gates
16. Verification of Demorgan's theorem using Logic gates
17. Verification of Boolean expressions Logic gates
18. Study of XOR and XNOR – Using ICs
19. Verification of NAND as universal building block.
20. Verification of NOR as universal building block.
21. Construction of Half adder and full adder
22. Construction of R-S, J-K and D flip-flops
23. Study of Mod 5 and Mod 10 counters

24. Construction of Ring counters
25. Construction of Shift registers
26. Write a program using Microprocessor – 8085 and verify for addition, subtraction
27. Write a program to execute 1's and 2's complement subtraction using Microprocessor – 8085
28. Write a program using Microprocessor – 8085 for multiplication and division
29. Write a program to find the 8 bit -largest/smallest of numbers Microprocessor 8085
30. Write a program to perform ascending/descending order using Microprocessor 8085

#### Teaching Learning Methods:

- Lecture Method, Demonstration, ICT, Hands-on session.

#### Course Outcomes

On completion of the course, the students will be able to

**CO 1:** Study the various characteristics of operational amplifier IC 741.

**CO 2:** Calculate the gain and bandwidth using ~~single stage and~~ two stage amplifiers.

**CO 3:** Construct Oscillators, multivibrators and compare the theoretical and experimental frequency

**CO 4:** Perform the arithmetic & Logical operations of 4 bit and 8-bit microprocessor kit.

**CO 5:** Analyze and verify the various logic gates and theorems.

#### Mapping of COs with PSOs & POs:

SEMESTER V & VI	Subject Code:22UPYP46								Title of Paper: PHYSICS LAB IV (Electronics)					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2		2	3	2			2	3	3	2	3	25
CO2	3	3		3	3	2			3	2	3	3	3	28
CO3	3	3		3	2	3			3	2	3	3	3	28
CO4	3	2		3	2	2			2	3	2	3	3	25
CO5	3	3		2	2	2			3	2	3	3	3	26
Grand total of COs with PSOs and POs													132	
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{132}{50}\right)$													2.64	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.64
Observation	<b>COs of Physics Lab – IV (Electronics) Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**  
**Department of Physics - B.Sc. (Physics) Syllabus – 2020 - 21 onwards**

<b>Class</b>	<b>: III Year</b>	<b>Part</b>	<b>: III (Core Elective-2)</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>: 45</b>
<b>Code</b>	<b>: 20UPYE26(A)</b>	<b>Credit</b>	<b>: 2</b>

**BASIC ELECTRIC PRINCIPLES AND APPLICATIONS**

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**COURSE OUTCOMES**

On completion of the course, the students will be able to

- CO 1:** Acquire knowledge on the nature of electricity and fundamental laws.
- CO 2:** Apply the knowledge of the heating effects of electric current in various fields.
- CO 3:** Understand the concept of illumination.
- CO 4:** Study the basics of transformers, generation and transmission of electricity.
- CO 5:** Analyze the working of cells and batteries.

**Unit I Nature of electricity and fundamental laws (9 hours)**

Nature of electricity- electronic theory-flow of electric current –electron drift- electrical circuit- path of electric current –types of electric circuits –electrical terms (definition) –laws of resistance – variation in resistance with temperature- combination of resistances –ammeter- voltmeter. work, power, energy.

**Unit II Chemical and Heating effects of electric current (9 hours)**

Heating effects of electric current, Joule’s law of heating- thermal efficiency- heating unit- materials for heating elements- applications of heating effect (incandescent lamp, arc welding, electric heaters, room heater, soldering iron, electric kettle, electric iron, water heater: immersion water heater, storage water heater). Fuse (classification, parts, types)-precautions for renewing a fuse.

**Unit III Illumination (9 hours)**

Definitions and units, laws of illumination, incandescent lamps. Different types of lamps- gas filled lamp, carbon arc lamp, gas discharge lamp, sodium vapour lamp, mercury vapour lamp, fluorescent tube; used of choke and starter,. Neon- light tubes and neon lamps- solar cells.

**Unit IV Transformer, Generation and transmission of electricity (9 hours)**

Introduction- principle- types of transformers-construction – advantages of transformer- uses. Generation of Thermal power, hydro power, nuclear power and non – conventional power, transmission of power.

**Unit V Cells and Batteries (9 hours)**

Production of EMF, Classification of cells, Characteristics of a cell- Care and maintenance -Secondary cell-Construction of Lead Acid Battery – Charging of battery- Indications of fully charged cell-Capacity of battery- Precautions for battery charging- Maintenance of battery.

**TEXT BOOKS:**

1. P.S.Dhokal –, Basic electrical engineering ,Vol -I ,Tata McGraw-Hill Publishing Company limited.  
UNIT I – Ch.3, 4 (relevant sections)  
UNIT II – Ch.5 (relevant sections)
2. P.S.Dhokal – Basic electrical engineering ,Vol- II, Tata McGraw – Hill Publishing Company limited.  
UNIT III – Ch. 20(relevant sections)  
UNIT IV- Ch.14 (relevant sections)  
UNIT V- Ch 24 (relevant sections)
3. G.D RAI, Non- conventional energy sources.  
UNIT V- Ch 9 (relevant sections)

**REFERENCES:**

1. M.L Anwani , Basic electrical engineering-Dhamp at Rai& co (p)LTD.
2. B.L .THERAJA, A.K THERAJA, Electrical technology, S.Chand& Company Ltd, New Delhi.

**WEBLINKS/E - Resources:**

- 1) [https://www.anixter.com/en\\_au/resources/literature/technical-references/the-basic-principles-of-electricity.html](https://www.anixter.com/en_au/resources/literature/technical-references/the-basic-principles-of-electricity.html)
- 2) <https://energizer.com/science-center/the-principles-of-electricity/>

**Mapping of COs with PSOs & POs:**

Semester: VI	Subject Code: 22UPYE26A								Title of Paper: BASIC ELECTRIC PRINCIPLES AND APPLICATIONS					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2	1	2	2	1			3	2	2	3	3	24
CO2	3	3	3	2	3	2			3	3	3	3	2	30
CO3	3	3	2	2	3	3			3	3	3	2	3	30
CO4	3	2	3	3	3	2			3	3	2	3	3	30
CO5	3	3	3	3	2	2			3	3	2	3	2	29
Grand total of COs with PSOs and POs													143	
Mean value of COs with PSOs and $POs = \frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left( \frac{143}{52} \right)$													2.75	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.75
Observation	<b>COs of Basic Electric Principles and Applications Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**  
**Department of Physics**

<b>Class</b>	<b>: B.Sc. PHYSICS</b>	<b>Part</b>	<b>: III (Core Elective-2)</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>: 45</b>
<b>Subject Code</b>	<b>: 22UPYE26 (B)</b>	<b>Credit</b>	<b>: 2</b>

**MEDICAL PHYSICS**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives:**

- To understand basic human physiological system and simple medical instruments
- To explain the designing and working of bio signal amplifiers and recorders
- To elaborate the concepts behind physiological assist devices and understand its importance
- To interpret the working of specialized medical equipment
- To realize and cognize the basic ethics involved in medical physics practice

**UNIT I: Biopotential Electrodes and Transducers** **(9 Hrs)**

Cell and their structure - Transport of ions through cell membrane – Resting potential & action potential; Bio electric potential - Design of medical instruments - Electrodes – Micro, Depth & Surface - Transducers (active, passive, resistive transducers only) – Bio-sensors (definition only).

**UNIT II: Bio-Signal Amplifiers and Recorders** **(9 Hrs)**

Isolation amplifier - Medical pre amplifier design - Chopper amplifier (Mechanical and non-mechanical chopper)- Bio signal analysis (Analog and digital methods, signal to noise improvement (methods only)) - Characteristics of recording systems (writer and pen damping effects) - Electrocardiography (origin of cardiac action potential) – Electroencephalography (origin of EEG) - Electromyography (recording setup) –Recorders with high accuracy.

**UNIT III: Physiological Assist Devices** **(9 Hrs)**

Pace makers (energy requirements to excite heart muscle)- Artificial heart valves (requirements, different neutral heart valve, different types of artificial heart valve)– Defibrillators (internal and external) - Nerve and muscle stimulators (stimulation of nerves) - Heart lung machine (mechanical function of heart) - Kidney machine (renal function and dialysis).

**UNIT IV: Medical Equipments & Modern Imaging Systems** **(9 Hrs)**

Oximeters (in-vitro and in-vivo) - Blood cell counters - Electron microscope - Radiation detectors (Geiger Muller counter only) - Digital thermometers – X-ray tube - X-ray Machine (Block diagram of X-ray machine only) – Lasers in medicine (laser action only) - Endoscopes – Ultrasonic imaging system (principle) – Magnetic resonance imaging (principle) – positron emission tomography (principle)

## UNIT V: Ethics In Medical Physics Practice

(9 Hrs)

General workplace ethics – professional relationships – practice audits – code of conduct – maintenance of competence – resources – communicating medical errors – whistle blower protection – professional conflict of interest - research – integrity in dealing with healthcare data and patients – need for human research ethics committee clearance – General medical ethics – interaction with patients and public.

### Text Book

1. M. Arumugam, Bio-Medical Instrumentation, Third edition - Anuradha Publication - 2016.  
Unit – I Chapter –1: 1.2, 1.4, 1.5, 1.6; Chapter–2: 2.2, 2.4, 2.4.4, 2.4.5, 2.4.6, 2.4.7, 2.5, 2.5.1 – 2.5.7  
Unit – II Chapter –3: 3.3, 3.4, 3.8, 3.8.1, 3.8.2, 3.9, 3.9.1, 3.9.2  
Chapter –4: 4.2, 4.2.1, 4.3, 4.3.1, 4.4, 4.4.1, 4.5, 4.5.1, 4.7  
Unit – III Chapter –5: 5.2, 5.2.1, 5.4, 5.4.1, 5.4.2, 5.4.3, 5.5, 5.5.1, 5.6, 5.6.1, 5.7, 5.7.1, 5.8, 5.8.1, 5.8.2  
Unit – IV Chapter –6: 6.15; Chapter –7: 7.2, 7.4, 7.5, 7.5.1, 7.5.2, 7.6, 7.8, 7.9;  
Chapter –10: 10.3, 10.4, 10.9 (principle only), 10.10 (principle only), 10.11
2. IAEA, Guidelines on professional Ethics for medical physicists, International Atomic Energy Agency – Training Course Series (78) - 2023  
Unit – V: Section - 4: 4.1, 4.1.1 – 4.1.8; 4.3, 4.3.1-4.3.2, 4.4, 4.4.1-4.4.2

### Books for Reference:

1. R. S. Khandpur - Handbook of Biomedical Instrumentation - Tata McGraw-Hill, New Delhi - 1999.
2. Leslie Cromwell, Fred J. Weibell & Erich A. Pfeiffer - Biomedical Instrumentation and Measurements, II edition - Prentice Hall of India Private Limited, New Delhi - 2003.

### Teaching Learning Methods:

- Lecture Method, Demonstration, ICT, Assignment, Quiz, Group Discussion

### Weblinks/E - Resources:

1. [https://www-pub.iaea.org/MTCD/publications/PDF/TCS-78\\_web.pdf](https://www-pub.iaea.org/MTCD/publications/PDF/TCS-78_web.pdf)
2. <https://ijarsct.co.in/Paper988.pdf>
3. [https://www-pub.iaea.org/MTCD/Publications/PDF/TCS-78\\_web.pdf](https://www-pub.iaea.org/MTCD/Publications/PDF/TCS-78_web.pdf)

### Course Outcomes

On completion of the course, the students will be able to

**CO1:** Understand the simple medical instruments

**CO2:** Explain the working of bio signal amplifiers and recorders

**CO3:** Discuss the basic concepts of physiological assist devices

**CO4:** Interpret the working of specialized medical equipment

**CO5:** Cognize the basic medical physics ethics

**Mapping of COs with PSOs & POs:**

Semester: VI	Subject Code: 22UPYE26B								Title of Paper: MEDICAL PHYSICS					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	3	0	3	2	3	0	1	3	2	3	2	3	27
CO2	2	3	0	3	3	3	0	0	3	1	3	2	3	26
CO3	2	3	0	3	2	3	0	0	3	2	3	2	3	26
CO4	3	3	0	3	2	3	0	1	3	3	3	2	3	29
CO5	3	2	0	2	2	3	0	0	3	3	2	2	3	25
Grand total of COs with PSOs and POs													133	
Mean value of COs with PSOs and $POs = \frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left( \frac{133}{52} \right)$													2.56	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.56
Observation	<b>COs of Medical Physics Strongly related with PSOs and POs</b>		

**Arul Anandar College (Autonomous), Karumathur**

**Department of Physics**

<b>Class</b>	<b>: B.Sc. PHYSICS</b>	<b>Part</b>	<b>: III (Core Elective-2)</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>: 45</b>
<b>Subject Code</b>	<b>: 22UPYE26 (C)</b>	<b>Credit</b>	<b>: 2</b>

**OPTOELECTRONICS**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives:**

- To understand phenomena of light such as Polarisation, Birefringence, electro-optic, magneto-optic and acousto-optic effect and NLO.
- To explain the principle and working of Display devices
- To elaborate the concepts of Lasers, Laser Sources such as Semiconductor, Dye and Gas Lasers.
- To describe the principle and working of specialized optical instruments like Photodiode, Photoresistors, Phototransistors
- To elucidate the basic ideas of optical communication systems

**Unit I Light** **(9 Hrs)**

Nature of light- wave nature of light, light sources, polarisation, Birefringence, optical activity- electro-optic effect, Kerr Modulators, Scanning and switching, magneto-optic effect, acousto-optic effect, Non-linear optics.

**Unit II Display Devices** **(9 Hrs)**

Radiative and non-radiative transitions, direct and indirect band gap materials, light emitting electronic materials, SC quantum dots, photon absorption and emission in semiconductors, Electron-Hole pair generation. Luminescence, Photoluminescence, cathode luminescence, cathode ray tube, electroluminescence, Plasma displays, display brightness, liquid crystal displays- numeric displays.

**Unit III Lasers** **(9 Hrs)**

Emission and absorption of radiation- population inversion and threshold condition- properties of lasers, Types of lasers: Doped insulator lasers- semiconductor lasers- gas lasers- dye lasers; laser applications- measurement of distance- holography- industrial applications- medical applications- laser induced nuclear fusion.



**CO2:** Explain the principle and working of Display devices

**CO3:** Elaborate the concepts of Lasers, Laser Sources such as Semiconductor, Dye and Gas Lasers.

**CO4:** Describe the principle and working of specialized optical instruments like Photodiode, Photoresistors, Phototransistors

**CO5:** Elucidate the basic ideas of optical communication systems

**Mapping of COs with PSOs & POs:**

Semester: VI	Subject Code: 22UPYE26C								Title of Paper: OPTOELECTRONICS					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	3	0	3	2	3	0	3	3	2	3	3	3	30
CO2	2	3	0	3	3	3	0	1	3	1	3	2	3	27
CO3	2	3	0	3	2	3	0	2	3	2	3	3	3	29
CO4	3	3	0	3	2	3	0	1	3	3	3	2	3	29
CO5	3	2	0	2	2	3	0	3	3	3	2	2	3	25
Grand total of COs with PSOs and POs													140	
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{133}{52}\right)$													2.56	

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.56
Observation	COs of Medical Physics Strongly related with PSOs and POs		

**Arul Anandar College (Autonomous), Karumathur**

**Department of Physics**

<b>Class</b>	<b>: B.Sc. PHYSICS</b>	<b>Part</b>	<b>: Self Learning Course</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>:</b>
<b>Subject Code</b>	<b>: 22UPYSL6</b>	<b>Credit</b>	<b>: 3</b>

**Optical Communication**

**(For Students admitted from the Academic Year 2022-2023 onwards)**

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**Course Objectives**

- To understand the basic concepts of Optical communications
- To study the optical fibre modes, classification of optical fibers
- To acquire the knowledge of optical phenomena such as attenuation, absorption, bending losses, dispersion, Intra & Inter modal dispersion.
- To examine the various optical sources and detectors
- To discuss the various optical networks, and their optical components .

**UNIT – I Overview of Optical Communication**

Introduction, Free space communications, Historical development, general system, advantages, disadvantages, and applications of optical fiber communication, Total internal reflection, Acceptance angle, Numerical Aperture construction of Optical Fiber and its Properties, propagation of light, refractive index profile.

**Unit II Optical Fibers**

Optical fiber waveguides, Ray theory, cylindrical fiber (no derivations) single mode fiber, cutoff wave length, mode field diameter. Optical Fibers: fiber materials, photonic crystal, fiber optic cables specialty fibers.

**UNIT - III Transmission Characteristics of Optical Fibers**

Introduction, Attenuation, absorption, scattering losses, bending loss, dispersion, Intra modal dispersion, Inter modal dispersion.

**UNIT - IV Optical Sources and Detectors**

Introduction, LED's, LASER diodes, Photo detectors, Photo detector noise, Response time, double hetero junction structure, Photo diodes, comparison of photo detectors. 7 Hours

**UNIT - V Optical Networks**

Introduction, fiber alignment and joint loss, single mode fiber joints, fiber splices, fiber connectors and fiber couplers, SONET / SDH, Optical Interfaces, SONET/SDH rings, High – speed light – waveguides.

**Text Books:**

1. Optical Fiber Communication – Gerd Keiser, 4th Ed., MGH, 2008.

2. Optical Fiber Communications– – John M. Senior, Pearson Education. 3 rd Impression, 2007.

**Books for Reference:**

1. Fiber Optic Communications – D.K. Mynbaev , S.C. Gupta and Lowell L. Scheiner, Pearson Education,2005.
2. Text Book on Optical Fiber Communication and its Applications – S.C.Gupta, PHI, 2005.
3. Fiber Optic Communication Systems – Govind P. Agarwal , John Wiley, 3rd Edition, 2004.
4. Fiber Optic Communications – Joseph C. Palais, 4th Edition, Pearson Education, 2004.

**Teaching Learning Methods:**

- Lecture Method, Demonstration, ICT, Assignment, Quiz, Group Discussion

**WEBLINKS/E - Resources:**

1. <https://www.geeksforgeeks.org/optoelectronic-devices/>
2. <https://www.allaboutcircuits.com/technical-articles/an-introduction-to-optoelectronics/>
3. <https://www.elprocus.com/optoelectronics-devices-with-their-applications/>
4. <https://www.techopedia.com/definition/2622/optoelectronics>

**Course Outcomes**

On completion of the course, the students will be able to

**CO1:** Understand the phenomena of light such as Polarisation, Birefringence, electro-optic, magneto-optic and acousto-optic effect and NLO

**CO2:** Explain the principle and working of Display devices

**CO3:** Elaborate the concepts of Lasers, Laser Sources such as Semiconductor, Dye and Gas Lasers.

**CO4:** Describe the principle and working of specialized optical instruments like Photodiode, Photoresistors, Phototransistors

**CO5:** Elucidate the basic ideas of optical communication systems

**Mapping of COs with PSOs & POs:**

Semester: VI	Subject Code:								Title of Paper: MEDICAL PHYSICS					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	3	0	3	2	3	0	1	3	2	3	2	3	27
CO2	2	3	0	3	3	3	0	0	3	1	3	2	3	26
CO3	2	3	0	3	2	3	0	0	3	2	3	2	3	26
CO4	3	3	0	3	2	3	0	1	3	3	3	2	3	29
CO5	3	2	0	2	2	3	0	0	3	3	2	2	3	25
Grand total of COs with PSOs and POs														133

Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{133}{52}\right)$	2.56
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Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.56
Observation	<b>COs of Medical Physics Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF PHYSICS**  
**VALUE ADDED COURSE**

**Course Code**

**:**

**Semester** : Odd / Even

**Hours**

**: 30**

**MOBILE PHONE HARDWARE TECHNICIAN**

(To be introduced from the academic year 2023-24)

**Learning Outcomes**

*At the end of the course, the students will be able*

1. To acquire the knowledge of basics of electronics and parts of mobile phone
2. To practice and check the tools in electronics
3. To practice and check the parts of mobile phone

**UNIT I:**

**(10 Hours)**

**A. Theory Syllabus**

1. Basics of Electronics: 1.1 Resistor, 1.2 Capacitor, 1.3 Transistor, 1.4 Diode, 1.5 Fuse, 1.6 Crystal Oscillator, 1.7 Inductor, 1.8 ICs
2. Power Supply Unit: 2.1 AC, 2.2 DC, 2.3 Frequency, 2.4 Voltage, 2.5 current
3. Mobile phone Charging Circuit, 4. Serial and Parallel Circuits 5. Mobile External Parts – Names, 6. Mobile Internal Parts – Names, 6. Hot Testing, 7. Cold Testing, 8. Tracking, 9. What are the tools used for mobile repairing?, 10. Trouble Shooting

**UNIT II:**

**(10 Hours)**

**Practical Syllabus**

1. External Part Checking
  - 1.1 How to use Multimeter?
    - 1.1.1 How to check a microphone?
    - 1.1.2 How to check an ear speaker?
    - 1.1.3 How to check a loudspeaker?
    - 1.1.4 How to check a vibration motor?
    - 1.1.5 How to check an LED?
    - 1.1.6 How to check a battery?
2. Warm-up
  - 2.1 How to use an ultrasonic cleaner
    - 2.1.1 Manual Warm-up Method
3. IC Remove / Fixing
  - 3.1 How to use an SMD Rework station
    - 1.1.1 IC Remove
    - 1.1.2 IC Fix
    - 1.1.3 SMD Components Remove/fixing
    - 1.1.4 Soldering Display remove

- 1.1.5 charger connector remove/fixing
- 1.1.6 Battery connector remove/fixing
- 1.1.7 SIM connector remove/fixing
- 4. Soldering & De-soldering
  - 4.1 How to use a solder machine
    - 4.1.1 Jumper
    - 4.1.2 Soldering
    - 4.1.3 De-soldering
- 5. Mobile Opening Method
  - 5.1 Dismantle
  - 5.2 Assemble

**UNIT III:**

**(10 Hours)**

**Practical Syllabus**

- 6. Trouble Shooting
  - 6.1 How to check short circuits in mobile phone
  - 6.2 How to remove short circuits in mobile phone
  - 6.3 How to repair water damage in mobile phone
- 7. Hot Testing in ON condition Mobile PCB
  - 7.1 How to check a vibration motor voltage
  - 7.2 How to check a battery connector
  - 7.3 How to check an ON / OFF switch
  - 7.4 How to check a charger connector
  - 7.5 How to check a SIM connector
- 8. Cold Testing in ON condition Mobile PCB
  - 8.1 How to check a vibration motor voltage
  - 8.2 How to check a battery connector
  - 8.3 How to check an ON / OFF switch
  - 8.4 How to check a charger connector
  - 8.5 How to check a SIM connector

**Mapping of COs with PSOs & POs:**

SEMESTER	Subject Code:								Title of Paper: Mobile Phone Hardware Technician					Sum of COs with PSOs and POs
	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
Course Outcomes (CO'S)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	3			3	3		3	3	3	3	3	30
CO2	3	3	3			3	2		3	3	3	3	3	29
CO3	3	3	2			3	3		3	3	3	3	3	29

Grand total of COs with PSOs and POs	88
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{88}{39}\right)$	2.25

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.25
Observation	<b>COs of Mobile Phone Hardware Technician strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF PHYSICS**  
**VALUE ADDED COURSE**

**Course Code**

**:**

**Semester** : Odd / Even

**Hours**

**: 30**

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**MOBILE PHONE SOFTWARE TECHNICIAN**

(To be introduced from the academic year 2023-24)

**Learning Outcomes**

***At the end of the course, the students will be able***

- 1. To acquire the knowledge of basics of electronics and parts of mobile phone**
- 2. To practice and check the tools in electronics**
- 3. To practice and check the parts of mobile phone**

**UNIT I:**

**(10 Hours)**

**Basic Software Theory**

1. Mobile phone software introduction
2. Purpose of studying mobile software
3. What are software complaints in mobile? : 3.1 hang on logo problem, 3.2 Auto restart problem, 3.3 FRP lock, 3.4 Network lock
4. What are the types of software in smart mobile?: 4.1 Android OS, 4.2 Apple iOS, 4.3 Blackberry OS, 4.4 Symbian OS
5. What are Android OS, Its types, and different versions?
6. How to find the mobile model and Android version on the website
7. What are the software boxes and software tools and explain: 7.1 Z3X, 7.2 Miracle, 7.3 BST, 7.4 UMT
8. How to download Mobile USB / MODEM / ADB / Boot-loader drivers
9. How to choose Mobile flash tool by chipset: 9.1 MediaTek, 9.2 Qualcomm, 9.3 Spectrum, etc.,

**UNIT II:**

**(20 Hours)**

**Practical:**

1. How to enter modes in mobile like fast boot chipset EDL mode recovery mode download mode
2. How to download Mobile firmware
3. How to download a Mobile USB driver
4. How to flash Samsung mobile using the odin3 tool
5. What boot loader and how do unlock and relock
6. What is FRP lock and how to remove?

**Mapping of COs with PSOs & POs:**

SEMESTER	Subject Code:								Title of Paper: Mobile Phone Software Technician					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	3			3	2		3	3	3	3	3	29
CO2	3	3	3			2	2		3	3	3	3	3	28
CO3	3	3	3			3	3		3	3	3	3	3	30
Grand total of COs with PSOs and POs														87
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{87}{39}\right)$														2.23

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.23
Observation	<b>COs of Mobile Phone Software Technician strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF PHYSICS**  
**VALUE ADDED COURSE**

**Course Code** : 23VPYO1 **Semester** : Odd / Even  
**Hours** : 30

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**House wiring**

**(To be introduced from the academic year 2023-24)**

**Learning Outcomes**

The trainee will be able to

- Observe the safety precautions while working.
- List out the necessary hand tools and their uses.
- Draw and describe simple electrical circuits.
- Know the different system of wiring used for domestic installation.
- Know the necessity of good earthing in an electrical installation.
- Do the electrical installation testing before energising a domestic installation.

**UNIT I:** **(10 Hours)**

**A. Theory Syllabus**

Basic Electrical safety - Electrical terms, definitions & measurements - Types of wires & selection of wire size

**B. Practical Syllabus**

Electrical safety practice - Simple problems related to Electrical circuits - Using SWG plate - Using Micrometer - Load classification & calculation

**UNIT II:** **(10 Hours)**

**A. Theory Syllabus**

Electrical accessories fixing method - Electrical wiring - Circuit distribution

**B. Practical Syllabus**

Identifying & Fixing the electrical accessories - Simple wiring practice - Distribution box wiring

**UNIT III:** **(10 Hours)**

**A. Theory Syllabus**

Power & Light load classification - Energy meter wiring - Earthing and its classification - Trouble shooting in house wiring

**B. Practical Syllabus**

Splitting the power & light load - Energy meter installation - Measuring the earth resistance - Using tester - Using Multimeter - Using Megger

**Mapping of COs with PSOs & POs:**

SEMESTER	Subject Code:								Title of Paper: House wiring					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2	3			3	3		3	3	3	3	3	29
CO2	3	3	3			3	3		3	3	3	3	3	30
CO3	3	3	3			3	3		3	3	3	3	3	30
Grand total of COs with PSOs and POs														89
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{89}{39}\right)$														2.28

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.28
Observation	<b>COs of House wiring strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF PHYSICS**  
**VALUE ADDED COURSE**

**Course Code** : 23VPYO2 **Semester** : Odd / Even  
**Hours** : 30

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**Servicing of Electrical Appliances**  
**(To be introduced from the academic year 2023-24)**

**Learning Outcomes**

The trainee will be able to

- Observe the safety precautions while working, testing the wire connections.
- Identify the faulty component of an appliance and replace it.
- Dismantle and reassemble an electric appliance such as water heater, iron box, room heater, hair dryer, mixer/juicer, wet grinder, etc.

**UNIT I:** **(10 Hours)**

**A. Theory Syllabus**

Basic Electrical safety - Electrical terms, definitions & measurements - Testing methods of electrical appliances.

**B. Practical Syllabus**

Electrical safety practice - Simple problems related to Electrical circuits - Using line tester - Using test lamp - Using multimeter.

**UNIT II:** **(10 Hours)**

**A. Theory Syllabus**

Construction & Working principle of electrical appliances - Fluorescent tube light - Electrical iron box.

**B. Practical Syllabus**

Test, connect and run the electrical appliances - Servicing of fluorescent tube light - Servicing of electrical iron box.

**UNIT III:** **(10 Hours)**

**A. Theory Syllabus**

Water heater / Geyser - Fan (Table / Ceiling / Exhaust ) - Wet Grinder - Mixer grinder / Juicer

**B. Practical Syllabus**

Servicing of water heater / Geyser - Servicing of Fan (Table / Ceiling / Exhaust) - Servicing of wet grinder - Servicing of Mixer grinder / Juicer

**Mapping of COs with PSOs & POs:**

SEMESTER	Subject Code:								Title of Paper: Servicing of Electrical Appliances					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	3			3	3		3	3	3	3	3	30
CO2	3	3	3			3	3		3	3	3	3	3	30
CO3	3	3	3			3	3		3	3	3	3	3	30
Grand total of COs with PSOs and POs														90
Mean value of COs with PSOs and POs = $\frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \left(\frac{90}{39}\right)$														2.30

Strong – 3, Medium – 2, & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.30
Observation	<b>COs of Servicing of Electrical Appliances strongly related with PSOs and POs</b>		



**DEPARTMENT OF CHEMISTRY**



**DEPARTMENT OF CHEMISTRY**  
**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**Programme Outcomes (POs)**

After completion of this three-year programme, the students will be able to

- PO1:** disseminate and demonstrate the knowledge of the concepts in the concerned discipline.
- PO2:** comprehend the essentials of Humanities/ arts/ science/ commerce subject matters efficiently and think effectively.
- PO3:** develop the spirit of cooperation, team work and leadership qualities with the wide awareness of his social responsibility towards the transformation of the community and to the nation at large.
- PO4:** apply the obtained knowledge for assessing social, economic, legal and cultural issues and the consequent responsibilities relevant to the present situations.
- PO5:** create a favourable ambience for pursuing higher degree in their respective discipline for further application of knowledge and to open vistas for lifelong learning.
- PO6:** acquire analytical reasoning, problem solving skills, technical skills, critical and reflective thinking through modern methods of learning for enhancing employability and entrepreneurship.
- PO7:** communicate the higher educational experience after testing and evaluating to meet the growing demands in the field of science and technology with the unification of multidisciplinary competency.
- PO8:** conceptualize the comprehensive background in humanities/arts/science/physical/mathematical and computing sciences and blend with the ameliorating technology developments and digital literacy for broadening the creativity.

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**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**Programme Specific Outcomes (PSOs)**

*The programme enables the students to*

**PSO1:** recognise the basic concepts of Chemistry and to provide students with the skills required to succeed in future career prospects in Chemistry

**PSO2:** acquire the ability to identify and describe the principles of pure and applied Chemistry

**PSO3:** apply the contextual knowledge of Chemistry to identify and solve problems, think significantly and to function effectively as an individual in multidiscipline

**PSO4:** synthesise, compare, evaluate, classify, interpret and effectively apply the basic laws, principles, process and mechanism involved in the domain of Chemistry

**PSO5:** impart a broad foundation in Chemistry and enable them to evaluate and analyse critically the scientific facts

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF CHEMISTRY**

**B.Sc. Chemistry – Course Structure under CBCS**

<b>I SEMESTER</b>				
<b>PART</b>	<b>Sub. Code</b>	<b>PAPER</b>	<b>Hrs</b>	<b>Cr</b>
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil / Hindi / French	6	4
II	22UENA11 22UENB11	English through Prose & Short Story (Stream-A) English through Prose & Short Story (Stream-B)	5	4
III	22UCHC11	Core-1 General Chemistry	6	5
	22UCHP12	Core Lab-I Volumetric Estimations	3	--
	22UCHB11	Allied Chemistry-I (for Mathematics)		
	22UCHR12	Allied Chemistry Lab (for Mathematics)		
	22UCHA11 22UMAB11	Allied Biochemistry-I/ Allied Mathematics-1	3/ 5	3/ 4
	22UCHQ12	Allied Biochemistry Lab	2	--
IV	22USBE11	Skill Based Elective-1 (Computer Literacy) Office Automation & Design	1	1
	22USBP11	Office Automation & Design - Practical	2	1
	22UFCE11	FC-Personality Development	1	1
	22UCSH12	Communication Skills	1	--
	22UBRC11	Bridge Course		1
V	22UNSS/NCC/Y RC/PHY.EDU./R OT/ACF/NCB12	Extension Activities NSS / NCC/Phy. Edn/ YRC/ROTARACT/AICUF/NATURE CLUB	--	--
		<b>Total</b>	<b>30</b>	<b>20/21</b>
<b>II SEMESTER</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil / Hindi / French	6	4
II	22UENA22 22UENB22	English through Prose & Poetry (Stream-A) English through Prose & Poetry(Stream-B)	5	4
III	22UCHC22	Core-2 Inorganic Chemistry-I	6	5
	22UCHP12	Core Lab-I Volumetric Estimations	3	3
	22UCHB22	Allied Chemistry-II (for Mathematics)		
	22UCHR12	Allied Chemistry Lab (for Mathematics)		
	22UCHA22 22UMAB22	Allied Biochemistry-II/ Allied Mathematics-II	3 5	3 4
	22UCHQ12	Allied Biochemistry Lab	2	2
IV	22USBE22	Skill Based Elective-2 Programming in C	1	1
	22USBP22	Programming in C Lab	2	1
	22UFCH22	FC-Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skills	1	1
V	22UNSS/NCC/ YRC/PED/ROT/A	Extension Activities NSS / NCC/Phy. Edn/ YRC/ROTARACT/AICUF/NATURE CLUB	---	1

	CF/ NCB12			
		<b>Total</b>	<b>30</b>	<b>26/25</b>
<b>III SEMESTER</b>				
I	22UTAL33/ 22UHNL33/ 22UFNL33	Tamil / Hindi / French	6	4
II	22UENA33 22UENB33	English through Literature-I (Stream-A) English through Literature-I (Stream-B)	6	4
III	22UCHC33	Core-3 Organic Chemistry-I	6	6
	22UCHP24	Core Lab-II Inorganic Qualitative Analysis	3	---
	22UCHB13	Allied Chemistry-I (for Physics)	3	3
	22UCHR14	Allied Chemistry Lab (for Physics)	2	---
		Allied-3 Physics Allied Physics Lab		
IV	22UCHN13	Basic Tamil/Advanced Tamil/Non-Major Elective- 1 Chemistry in Your Life	3	2
	22UFCE33	FC-Environmental Studies	1	1
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NSS/ NCC/ Phy. Edn./ YRC/ROTARACT/AICUF/NATURE CLUB	---	---
	22UARE14	ARISE		---
			<b>30</b>	<b>20</b>
<b>IV SEMESTER</b>				
I	22UTAL44/ 22UHNL44/ 22UFNL44	Tamil / Hindi / French	6	4
II	22UENA44 22UENB44	English through Literature-II (Stream-A) English through Literature-II (Stream-B)	6	4
III	22UCHC44	Core-4 Physical Chemistry-I	6	6
	22UCHP24	Core Lab-II Inorganic Qualitative Analysis	3	3
	22UCHA24	Allied Chemistry-II (for Physics)		
		Allied Chemistry Lab (for Physics)		
		Allied-4 Physics Allied Physics Lab	3 2	3 2
IV	22UCHN24	Basic Tamil/Advanced Tamil/Non-Major Elective- 2 Chemicals for Life and Living	3	2
	22UFCH44	Fc -Religious Literacy and Peace Studies	1	1
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NSS/ NCC/ Phy. Edn./ YRC/ ROTARACT/ AICUF/ NATURE CLUB	---	1
	22UARE14	ARISE		1
			<b>30</b>	<b>27</b>

V SEMESTER				
III	22UCHC55	Core-5 Organic Chemistry-II	6	5
	22UCHC65	Core-6 Inorganic Chemistry-II	5	5
	22UCHC75	Core-7 Physical Chemistry-II	5	5
	22UCHP35	Core Lab-III Organic Analysis	4	3
	22UCHP45	Core Lab-IV Organic Estimation & Preparation	4	3
	22UCHE15	Elective-1 (out of four)	4	3
	22UINT15	Internship (Holidays)		1
	22USSI16	Soft Skills	2	-
			<b>30</b>	<b>25</b>
VI SEMESTER				
III	22UCHC86	Core-8 Organic Chemistry-III	6	5
	22UCHC96	Core-9 Inorganic Chemistry-III	5	5
	22UCHD06	Core-10 Physical Chemistry-III	5	5
	22UCHP56	Core Lab-V Gravimetry and Preparation	4	3
	22UCHP66	Core Lab-VI Physical Chemistry	4	3
	22UCHE26	Elective-2 (out of four)	4	3
	22USSI16	Soft Skills	2	2
			<b>30</b>	<b>26</b>

Core Elective-1 : Medicinal Chemistry  
Analytical Chemistry  
Polymer Chemistry  
Soil Chemistry

Core Elective-2 : Industrial Chemistry  
Pharmaceutical Chemistry  
Environmental Chemistry  
Nutritional Chemistry

Non-Major Elective-1 : Chemistry in Your Life

Non-Major Elective-2 : Chemicals for Life and Living

Semester:	I	II	III	IV	V	VI	TOTAL	
Credits:	20/21	26/25		20	27	25	26	144*

\* 144 credits from 2022-2023 onwards

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHC55 Organic Chemistry-II		Hours	90
			Credit	5
<b>Class</b>	III B.Sc. Chemistry	Semester	V	
<b>Cognitive Levels</b>	K1, K2, K3			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• explain the preparation and properties of aldehydes and ketones and predict their stability of mechanisms (K2, K3)</li> <li>• explain the preparation, properties of saturated and unsaturated carboxylic acids and their reaction mechanisms (K2, K3)</li> <li>• identify the nature of polycyclic hydrocarbons and the effect Carcinogenic hydrocarbons (K1, K2)</li> <li>• compare and contrast the preparation, reactions of aromatic nitrogen compounds, amines and diazocompounds (K2, K3)</li> <li>• explain the properties and the importance of Amino acids, peptides and Proteins (K2, K3)</li> </ul>			
<b>UNIT</b>	<b>Contents</b>			<b>No. of Hours</b>
I	<p style="text-align: center;"><b>Carbonyl Compounds</b></p> <p>Nomenclature. Structure of carbonyl group. General methods of preparation and properties of aliphatic aldehydes and ketones- Acidity of <math>\alpha</math>-hydrogen. Chemical reactions- Haloform reaction. Nucleophilic addition reactions. Addition of ammonia derivatives. Condensation reactions- Mechanism of Aldol and Cannizarro reactions. Oxidation – Reaction with Tollen’s and Fehling’s reagents. Baeyer-Villiger oxidation of ketones. Reduction by MPV, Clemmensen, Wolff-Kishner and Metal Hydrides (<math>\text{LiAlH}_4</math> Vs. <math>\text{NaBH}_4</math>).</p> <p>Aromatic Aldehydes: Benzaldehyde – Preparation and properties – Claisen, Perkin, Benzoin and Knoevenagel reactions.</p> <p>Aromatic Ketones: Preparation, properties and reactions of Acetophenone, Benzophenone and p-Benzoquinone.</p>			18
II	<p style="text-align: center;"><b>Carboxylic acids and their Derivatives</b></p> <p>Preparation and reactions. Acidity of carboxylic acid. Effect of substituents on the acidity. Conversion to functional derivatives. Reduction. HVZ reaction.</p> <p>Preparation and reactions of Acrylic acid, Benzoic acid and Cinnamic acid.</p> <p>Substituted acids: Preparation and reactions of Glycolic acid,</p>			18

	<p>Lactic acid, Salicylic acid, Anthranilic acid. Action of heat on <math>\alpha</math>, <math>\beta</math>- and <math>\gamma</math>- hydroxy- and amino acids.</p> <p>Saturated dicarboxylic acids: Preparation and reactions of Oxalic, Malonic, and Succinic acids. Action of heat on dicarboxylic acids. Phthalic acid, Phthalic anhydride and Phthalimide.</p> <p>Unsaturated dicarboxylic acids: Preparation and reactions of Maleic and Fumaric acids.</p>	
III	<p style="text-align: center;"><b>Polycyclic Hydrocarbons</b></p> <p>Isolated Systems: Diphenyl and Diphenylmethane. Preparation and reactions</p> <p>Fused ring systems: Preparation and reactions of Naphthalene, Anthracene and Phenanthrene. Structural elucidation of Naphthalene and Anthracene.</p> <p>Preparation and reactions of Naphthols, Naphthylamines and Anthraquinone.</p> <p>Carcinogenic hydrocarbons. Preparation and properties of Methylcholanthrene.</p>	18
IV	<p style="text-align: center;"><b>Nitrogen Compounds</b></p> <p>Aromatic Nitro compounds – Nitrobenzene. Preparation and reactions. Reduction products of Nitrobenzene.</p> <p>Amines: Classification. Preparation and reactions. Basicity of amines. Separation of a mixture of primary, secondary and tertiary amines. Basicity of aliphatic amines. Effect of substituents on the basicity of aromatic amines.</p> <p>Aliphatic diazo compounds: Diazomethane, Diazoacetic ester. Preparation and reactions.</p> <p>Benzenediazonium chloride: Preparation and reactions.</p>	18
V	<p style="text-align: center;"><b>Amino acids, peptides and Proteins</b></p> <p>Aminoacids – definition, classification, structure – Zwitter ion – isoelectric point – separation of aminoacids: electrophoresis. Preparation and reaction of amino acids: Glycine, Alanine.</p> <p>Peptides: Nomenclature, classification and structure. Determination of structure of peptide, end group analysis, synthesis of peptides.</p> <p>Proteins- Classification according to composition and function, colour tests of proteins. Protein structure (<math>1^{\circ}</math>, <math>2^{\circ}</math>, <math>3^{\circ}</math> and <math>4^{\circ}</math>).</p>	18
<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. B. S. Bahl &amp; Arun Bahl. Advanced Organic Chemistry. S. Chand. 6<sup>th</sup> Edition (2022).</li> <li>2. P.L. Soni and H.W. Chawla, Text Book of Organic Chemistry, 21<sup>th</sup> Edition. Chand and company (2014).</li> <li>3. S.N Sanyal, Reactions, Rearrangements &amp; Reagents. 4<sup>th</sup> Edition, Bharati</li> </ol>	

	and Bhawan Publishers and Distributors (2019). <b>Reference Books</b> 1. Morrison Boyd & Bhattacharjee. Organic Chemistry. Pearson Education. 7 <sup>th</sup> Edition (2010). 2. Y. R. Sharma, Elementary Organic Spectroscopy. S. Chand. Revised Edition (2013). 3. I. L. Finar, Organic Chemistry: Volume 1, 6 <sup>th</sup> edition. Pearson (2012).
<b>Course Outcomes (COs)</b>	<b>On completion of the course, students will be able to</b> CO1: explain the preparation and properties of aldehydes and ketones and predict their stability of mechanisms. CO2: explain the preparation and properties of saturated and unsaturated carboxylic acids and their reaction mechanisms. CO3: identify the nature of polycyclic hydrocarbons and the effect carcinogenic hydrocarbons. CO4: compare and contrast the preparation, reactions of aromatic nitrogen compounds, amines and diazo compounds. CO5: explain the properties and the importance of amino acids, peptides and proteins.

#### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs With PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	3	2	3	3	2	3	3	-	-	3	2	2	2	28
	2	2	3	3	2	2	2	2	-	-	2	2	2	2	24
	3	2	2	2	2	2	2	2	-	-	1	2	2	2	21
	4	3	2	2	2	2	2	1	-	-	2	2	2	2	22
	5	2	2	2	2	2	3	2	-	-	2	1	2	2	22
Grand total of COs with PSOs & POs														117	
Mean value of COs with PSOs & POs = 114/55														2.13	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.13
Observation	COs of organic Chemistry-II strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHC65 Inorganic Chemistry-II		Hours	75
			Credit	5
<b>Class</b>	III B.Sc. Chemistry	Semester	V	
<b>Cognitive Levels</b>	K2, K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• describe and explain the general methods for extracting elements from their ores and their refining methods (K2, K3)</li> <li>• comprehend and discuss the properties and compounds of s-block metals (K2, K3)</li> <li>• explain and illustrate the general properties and compounds of group 13, 14 and 15 of p-block elements. (K3, K4)</li> <li>• explain and illustrate the general properties and compounds of group 16, 17 and 18 of p-block elements. (K2, K3)</li> <li>• describe the types of solids, types of crystals, their characteristic features, arrangements, imperfections and calculate the necessary parameters. (K2, K3, K4)</li> </ul>			

<b>UNIT</b>	<b>Contents</b>	<b>No. of Hours</b>
<b>I</b>	<p><b>General Methods of Extraction of metals</b></p> <p>Occurrence of metals – ore and mineral – Forms of occurrence of ores – Metallurgy – Steps involved – Concentration of the Ore – Hand picking, gravity separation, magnetic separation, electrostatic separation, froth floatation</p> <p>Conversion of concentrated ore into metallic oxide – calcination and roasting.</p> <p>Reduction of metal oxides into metal – smelting, air reduction, self reduction and electrolytic Reduction</p> <p>Specialised Techniques – Amalgamation, Hydrometallurgy, Solvent Extraction and Ion exchange chromatography.</p> <p>Refining of metals –Liquation, Distillation, Oxidation, Thermal (Mond’s and van Arkel de Boer processes), Electro-refining and Zone refining.</p>	15
<b>II</b>	<p><b>Representative Elements – I (s-Block elements)</b></p> <p>Alkali metals – General Characteristics – solubility and hydration – anomalous behaviour of lithium – comparative study of elements – oxides, hydroxides and halides – Diagonal relationship of lithium with magnesium.</p> <p>Compounds of Alkali metals – preparation and properties – <math>\text{LiAlH}_4</math>, <math>\text{Li}_2\text{CO}_3</math>, <math>\text{NaCN}</math> and <math>\text{NaNH}_2</math>. Uses of alkali metals</p>	15

	Alkaline earth metals – General Characteristics – size of atoms and ions, ionisation energy, hydration energy – anomalous behaviour of beryllium. Diagonal relationship of beryllium with aluminium – comparative study – oxides, hydroxides, sulphates and carbonates Compounds of alkaline earth metals – preparation and structure of beryllium hydride and beryllium chloride – Uses of alkaline earth metals	
III	<p style="text-align: center;"><b>Representative Elements – II (p-Block elements-I)</b></p> <p>Group 13 elements – General characteristics – diagonal relationship of boron with silicon – Preparation, properties and structure of orthoboric acid, borax and diborane – Borax bead test – Relative strengths of boron trihalides and aluminum trihalides as Lewis acids.</p> <p>Group 14 elements – general characteristics – allotropes of carbon – structure of diamond, graphite and fullerene classification of metal carbides – preparation and uses of silicones</p> <p>Group 15 elements – general characteristics – compounds of nitrogen and phosphorous – preparation, properties and structure of hydrazine, hydroxylamine, nitrous acid, nitric acid, orthophosphoric acid and pyrophosphoric acid</p>	15
IV	<p style="text-align: center;"><b>Representative Elements – III (p-Block elements-II)</b></p> <p>Group 16 elements – Anomalous behaviour of oxygen – allotropes of sulphur – hydrides of sulphur and oxygen – oxy acids of sulphur – sulfurous acid, sulphuric acid, Caro's acid and Marshall's acid.</p> <p>Group 17 elements: unique character of fluorine – comparative study of halides and oxides – preparation and structure of <math>\text{OF}_2</math>, <math>\text{Cl}_2\text{O}</math> and <math>\text{I}_2\text{O}_5</math> – comparison of acidic strengths of Oxoacids of halogens – preparation, and structure of inter-halogen compounds (<math>\text{AX}</math>, <math>\text{AX}_3</math>, <math>\text{AX}_5</math> and <math>\text{AX}_7</math>) – Pseudohalogens</p> <p>Group 18 elements: Occurrence and position of Noble gases in periodic table – compounds of Noble gases – hydrates and clathrates – preparation, properties and structure of <math>\text{XeOF}_2</math>, <math>\text{XeOF}_4</math> and <math>\text{XeO}_3</math>.</p>	15
V	<p style="text-align: center;"><b>Solid State Chemistry</b></p> <p>General Characteristics of Solid State – Types of solids – Classification of crystalline solids – on the basis of inter-molecular forces and lattice parameters – Bravais lattices – unit cell – Miller indices – types of crystalline arrangements – hcp and ccp – types and importance of voids – calculation of edge length (a), radius of sphere (r) and interplanar distance (d) for cubic crystals – structure of rock salt, wurtzite, rutile, fluorite</p>	15

	and antifluorite – imperfections in solids – types of point defects.
<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. R. D. Madan. “Modern Inorganic Chemistry”, 4<sup>th</sup> Edition, S. Chand (2006)</li> <li>2. B. R. Puri, L. R. Sharma, K. C. Kalia. “Principles of Inorganic Chemistry”. 33<sup>rd</sup> Edition, Vishal Publishing Co. (2018)</li> <li>3. B. R. Puri, L. R. Sharma, Madan S. Pathania. “Principles of Physical Chemistry”. 48<sup>th</sup> Edition, Vishal Publishing Co. (2020)</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. John D. Lee. “Concise Inorganic Chemistry”, 5<sup>th</sup> edition, Wiley Publications (2014)</li> <li>2. Satya Prakash, G. D. Tuli, S. K. Basu, R. D. Madan, “Advanced Inorganic Chemistry”, 19<sup>th</sup> Edition, S.Chand (2008)</li> <li>3. Gary Miessler, Paul Fischer, Donald Tarr, “Inorganic Chemistry”, 5<sup>th</sup> Edition, Pearson Education (2014)</li> <li>4. Anthony R. West, “Solid State Chemistry and its Applications”, 2<sup>nd</sup> Edition, Wiley Publications (2022)</li> </ol>
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: describe and explain the general methods for extracting elements from their ores and their refining methods.</p> <p>CO2: comprehend and discuss the properties and compounds of s-block metals.</p> <p>CO3: explain and illustrate the general properties and compounds of group 13, 14 and 15 of p-block elements.</p> <p>CO4: explain and illustrate the general properties and compounds of group 16, 17 and 18 of p-block elements.</p> <p>CO5: describe the types of solids, types of crystals, their characteristic features, arrangements, imperfections and calculate the necessary parameters.</p>

#### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs with PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	2	2	2	3	2	2	3	-	-	3	2	2	-	23
	2	3	2	3	2	2	3	2	-	-	2	2	2	-	23
	3	2	3	3	2	2	2	2	-	-	2	2	2	-	22
	4	3	3	2	2	2	3	2	-	-	2	3	2	-	24
	5	2	2	3	2	2	3	3	-	-	2	3	2	-	24
Grand total of COs with PSOs & POs														116	
Mean value of COs with PSOs & POs = 114/55														2.11	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.11
Observation	COs of Inorganic Chemistry-II strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHC75 Physical Chemistry-II		Hours	75
			Credit	5
<b>Class</b>	III B.Sc. Chemistry	Semester	V	
<b>Cognitive Levels</b>	K2, K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• explain the principle of solutions (K2, K4)</li> <li>• derive and to apply the physical aspects of chemical kinetics (K2, K3)</li> <li>• discuss and to apply phase rule concept in heterogeneous equilibrium</li> <li>• apply the principles of photochemistry (K3, K4)</li> <li>• apply and analyse basic principles of quantum mechanics (K3, K4)</li> </ul>			

UNIT	Contents	No. of Hours
I	<p style="text-align: center;"><b>Solutions</b></p> <p>Ideal solutions – Vapour pressure-composition diagram of solution – Raoult's law – Positive and negative deviations from the law.</p> <p>Principle of fractional distillation. Steam distillation. Binary systems – Azeotropic distillation – Partially miscible binary liquid systems – Critical Solution Temperature. –UCST, LCST, both UCST and LCST – Effect of addition of solute on CST. Solubility of gases in liquids –Henry's law.</p> <p>Distribution law: Thermodynamic derivation – Limitation of the law – Application of studying association, dissociation and salvation - study of formation of complex ions – solvent extraction – efficiency of extraction – distribution law and colligative property.</p>	15
II	<p style="text-align: center;"><b>Chemical Kinetics</b></p> <p>Introduction – Rate of reaction – Rate law and rate constants – Order and molecularity of reactions – Derivation of rate constant and half life period for first and second order reactions – Examples for first and second order reactions – Third order reactions (No Derivation) – Methods of determining the order of a reaction –Complex reactions- parallel, opposite and consecutive reactions –Elementary idea. Influence of</p>	15

	temperature on the rate of a reaction. Arrhenius rate equation and its significance – Enzyme kinetics: Introduction – Factors affecting enzyme action – mechanism of enzyme action – Michaelis Menten equation – derivations.	
III	<p style="text-align: center;"><b>Phase Rule</b></p> <p>Phase rule – Concepts of phase, component and degrees of freedom – Gibbs phase rule- derivation – Clapeyron and Clausius-Clapeyron equation and their applications to equilibria in phase transitions (solid-liquid, liquid-vapour, solid-vapour). One component system: Water and Sulphur systems. Condensed phase rule: Two component systems: i) Simple eutectic- Lead-Silver system ii) Formation of compound with congruent and incongruent melting point <math>\text{FeCl}_3\text{-H}_2\text{O}</math> and <math>\text{Na}_2\text{SO}_4\text{-H}_2\text{O}</math> systems</p>	15
IV	<p style="text-align: center;"><b>Photochemistry</b></p> <p>Comparison of thermal and photochemical reactions – Laws of Photochemistry – Beer-Lambert law – Grothus-Draper law – Stark-Einstein law – Quantum efficiency and its determination, reason for low and high efficiency – Consequences of light absorption by atoms and molecules – Jablonski energy level diagram – Primary and secondary photo physical processes – Radiationless transition – internal conversion and intersystem crossing. Fluorescence and Phosphorescence – Applications – Chemiluminescence – Bioluminescence – Photosensitized reactions and applications.</p>	15
V	<p style="text-align: center;"><b>Quantum Chemistry</b></p> <p>Probability concept of electron – Schrodinger wave equation (No derivation) – Postulates of Quantum mechanics, Interpretation of wave function – Eigen values and Eigen function.(Problems excluded) Operator – Commuting, Hermitian – Solution of wave equation for particle in a one dimensional box – Schrodinger equation for hydrogen atom.</p>	15
<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>Principles of Physical Chemistry. B. R. Puri, Sharma and L. R. Pathania. Vishal Publishing (2018)</li> <li>Text Book of Physical Chemistry. M. V. Sankaranarayanan and V. Mahadevan. Universities Press (2011)</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>K. J. Laidler, Chemical Kinetics, 2<sup>nd</sup> edition, Tata McGraw Hill (1975)</li> <li>A. Frost and R. G. Pearson, Kinetics and Mechanisms, John Wiley &amp; Sons</li> </ol>	

	(1953) 3. J. C. Kuriacose and J. Rajaram, Kinetics and Mechanisms Transformations, MacMillan & Co., (1993)
<b>Course Outcomes (COs)</b>	<b>On completion of the course, students will be able to</b> CO1: explain the principle of solutions CO2: derive and to apply the physical aspects of chemical kinetics CO3: discuss and to apply phase rule concept in heterogeneous equilibrium CO4: apply the principles of photochemistry CO5: apply and analyse basic principles of quantum mechanics

### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs With PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	2	3	3	2	2	3	3	-	-	2	3	2	2	27
	2	3	2	2	2	3	2	3	-	-	2	2	3	2	26
	3	2	2	2	2	2	2	2	-	-	3	2	2	2	23
	4	3	3	2	2	2	3	2	-	-	2	2	2	2	25
	5	2	3	2	2	2	2	2	-	-	3	3	3	2	26
Grand total of COs with PSOs & POs														127	
Mean value of COs with PSOs & POs = 127/55														2.31	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.31
Observation	COs of Physical Chemistry-II strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHP35 Organic Analysis		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	V	
<b>Cognitive Levels</b>	K1, K2, K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• recognize the methods of organic compound analysis (K2)</li> <li>• explain the reactions involved in the organic analysis (K2)</li> <li>• find the functional group and to prepare a suitable derivative (K3, K4)</li> <li>• compare the properties of various functional groups (K3)</li> <li>• estimate the amount of given organic compounds quantitatively (K3, K4)</li> </ul>			

UNIT	Contents	No. of Hours
I	Preliminary Tests, (Test for Nature, aliphatic & aromatic and saturation and unsaturation nature of compounds)	60
II	Detection of elements – N, S and halogens	
III	<b>Identification of functional groups</b> Carboxylic acids – mono & di (saturated and unsaturated), Aldehydes, Ketones,	
IV	Reducing sugars, Primary Amines, anilides. Nitro Compounds, Esters, aromatic- mono amides, and aliphatic diamides, Aromatic- mono and dihydric phenols	
V	Preparation of Derivatives	
<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. V. Venkateswaran, R. Veerasamy, and A. R. Kulandaivelu, “Basic Principles of Practical Chemistry”, Sultan Chand &amp; Sons (2017)</li> <li>2. N. S. Gnanpragasam, Prof. G. Ramamurthy “Organic Chemistry: Lab Manual”, S. Viswanathan Co Printers &amp; Publishers Pvt. Ltd (2009)</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Thomas, A.O, <i>B.Sc. Main Practical Chemistry</i>, Scientific Book Centre (2003)</li> <li>2. Furniss Brian S, Hannaford and Antony J, “Vogel’s Textbook of Practical Organic Chemistry” Pearson India, 5<sup>th</sup> Edition (2016)</li> </ol>	

<b>Course Outcomes (COs)</b>	<b>On completion of the course, students will be able to</b> CO1: recognize the methods of organic compound analysis CO2: explain the reactions involved in the organic analysis CO3: identify the functional group and to prepare a suitable derivative CO4: compare the properties of various functional groups CO5: estimate the amount of given organic compounds quantitatively
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#### Mapping Course outcome with

Outcomes		PSO					PO								Sum of COs With PSOs & POs
		1	2	3	4	5	1	2	3	4	5	6	7	8	
CO	1	3	3	3	2	2	2	2	-	-	3	3	2	-	25
	2	3	3	2	2	2	3	2	-	-	3	3	2	-	25
	3	3	2	2	2	2	3	2	-	-	3	3	2	-	24
	4	3	3	3	3	2	3	2	-	-	3	3	2	-	27
	5	3	3	3	3	3	3	2	-	-	3	3	2	-	28
Grand total of COs with PSOs & POs														129	
Mean value of COs with PSOs & POs = 129/50														2.58	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.58
Observation	COs of Organic Analysis strongly related with PSOs and POs		

#### Continuous Internal Assessment (50 Marks)

S. No.	Components	Marks
1.	Observation Note book & Viva Voce	10
2.	Reports of the regular practical – Analysis	20
3.	Internal Test-I	10
4.	Internal Test-II	10
	<b>TOTAL</b>	<b>50</b>

**End-Semester Examination (50 Marks)**

<b>S. No.</b>	<b>Components</b>	<b>Marks</b>
1.	Record Note book & Viva Voce	10
2.	Procedure – Analysis & Estimation	10
3.	Organic Analysis – Preliminary Tests	20
4.	Confirmatory Tests – Functional group & derivative preparation	10
	<b>TOTAL</b>	<b>50</b>

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHP45 Organic Estimation & Preparation		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	V	
<b>Cognitive Levels</b>	K2, K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• explain the basics of organic estimation (K2)</li> <li>• describe the reactions involved in organic estimation (K3)</li> <li>• predict and describe the mechanism underlying organic estimation (K3, K4)</li> <li>• estimate the amount of given organic compounds quantitatively (K3, K4)</li> <li>• synthesise various organic molecules using oxidation, hydrolysis, nitration and benzylation (K4)</li> </ul>			

UNIT	Contents	No. of Hours
I	Estimation of Phenol	60
II	Estimation of Aniline	
III	Estimation of Ketone	
IV	Estimation of Glucose	
V	Organic Preparation involving (i) Oxidation of aldehydes (ii) Hydrolysis of amides (iii) Hydrolysis of esters (iv) Nitration of aromatic substrates (v) Benzylation of phenolic compounds	
<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>V. Venkateswaran, R. Veerasamy, and A. R. Kulandaivelu, "Basic Principles of Practical Chemistry", Sultan Chand &amp; Sons (2017)</li> <li>N. S. Gnanpragasam, Prof. G. Ramamurthy "Organic Chemistry: Lab Manual", S. Viswanathan Co Printers &amp; Publishers Pvt Ltd (2009)</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>Thomas, A.O, B.Sc. Main Practical Chemistry, Scientific Book Centre (2003)</li> <li>Furniss And Brian S And Hannaford And Antony J, "Vogel's Textbook of Practical Organic Chemistry" Pearson India, 5<sup>th</sup> Edition (2016)</li> </ol>	
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: explain the basics of organic estimation            CO2: describe the reactions involved in the organic estimation            CO3: predict and describe the mechanism underlying organic estimation            CO4: estimate the amount of given organic compounds quantitatively            CO5: synthesise various organic molecules using oxidation, hydrolysis, nitration and benzylation</p>	

### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs with PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	3	3	3	2	2	2	2	-	-	3	3	2	-	25
	2	3	3	2	2	2	3	2	-	-	3	3	2	-	25
	3	3	2	2	2	2	3	2	-	-	3	3	2	-	24
	4	3	3	3	3	2	3	2	-	-	3	3	2	-	27
	5	3	3	3	3	3	3	2	-	-	3	3	2	-	28
Grand total of COs with PSOs & POs														129	
Mean value of COs with PSOs & POs = 129/50														2.58	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.58
Observation	COs of Organic Estimation & Preparation strongly related with PSOs and POs		

### Continuous Internal Assessment (50 Marks)

S. No.	Components	Marks
1.	Observation Note book & Viva Voce	10
2.	Reports of the regular practical – Estimation	10
3.	Results of the regular practical – Preparation	10
4.	Internal Test-I	10
5.	Internal Test-II	10
	<b>TOTAL</b>	<b>50</b>

### End-Semester Examination (50 Marks)

S. No.	Components	Marks
1.	Record Note book & Viva Voce	10
2.	Procedure – Organic Estimation	10
3.	Preparation and display of the prepared organic compound	10
4.	Result of the estimation within prescribed limit	20
	<b>TOTAL</b>	<b>50</b>

<b>Course Code &amp; Title</b>	22UCHE15 (A) Medicinal Chemistry		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	V	
<b>Cognitive Levels</b>	K2, K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>state and explain the terminology of drugs.</li> <li>explain the fundamental knowledge about the nature of drugs, drug activity, structure-activity relationship, and drug synthesis.</li> <li>discuss a basic idea of drugs used for treating various diseases.</li> <li>discuss the uses of drugs in chemotherapy.</li> <li>identify the compositions and drugs used for blood.</li> </ul>			

<b>UNIT</b>	<b>Contents</b>	<b>No. of Hours</b>
<b>I</b>	<p align="center"><b>Unit I</b></p> <p>Introduction – history of medicinal chemistry – different systems of medicine-ayurveda, Siddha, homeopathy and allopathy – drugs – terminologies – pharmacy, pharmacology, pharmacognosy – Pharmacophore – pharmacodynamics – antimetabolites – chemotherapy – pharmacopoeia – sources of drugs – drug classification – biological and chemical classification – Mechanism of drug action and metabolism of drugs – Biotransformation, Absorption of drugs – Factors affecting the absorption.</p>	12
<b>II</b>	<p align="center"><b>Unit II</b></p> <p>Principles of drug discovery and synthesis – lead compounds – synthetic considerations – use of computers in drug design – relationship between chemical structure and pharmacological activity – effect of unsaturation, chain length-isomerism functional group-hydroxyl-alkyl – shortage of pharmaceutical substances – temperature – humidity – gases – light – containers – encapsulation.</p>	12
<b>III</b>	<p align="center"><b>Unit III</b></p> <p>Analgesics – Types – Nitrous Oxide, Ether, CHCl<sub>3</sub> – antipyretics – synthesis and uses of aspirin, paracetamol and phenactin and anti-inflammatory Agents – Classification based on structure – Salicylates – Paracetamol – Opioid analgesics – morphine and its analogues – NSAIDS – Important drugs – Antidepressant Drugs –</p>	12

	Definition Sedatives and Hypnotics Anxiety – Classification – Benzodiazepines and barbiturates.	
<b>IV</b>	<p style="text-align: center;"><b>Unit IV</b></p> <p>Cancer – types – causes – treatment of cancer – chemotherapy – basic principles of chemotherapy – molecular basis of chemotherapy – antibacterials – sulphonamides – antibiotics – beta-lactam antibiotics, tetracyclins, chloramphenicol, aminoglycosides, macrolides and flouroquinolones- Antimalarials – derivatives of 4 and 8-aminoquinoline – synthesis and structure.</p>	12
<b>V</b>	<p style="text-align: center;"><b>Unit V</b></p> <p>Blood- Composition-grouping – Rh factor – buffers in blood. Functions of plasma proteins – clotting mechanism – blood pressure, hypertension – cause, prevention and treatment, Antihypertensive Agents – aldomet and reserpine coagulants and anticoagulants- definition and examples.</p> <p>Antianemic drugs-drugs effective in iron deficiency anaemias- megsloblaticsanaemias- Cardiovascular drugs- definition and names of drugs used for each of the following –antiarrythmic agents, antihypertensives – antianginals, vasodilators – lipid lowering agents.</p> <p>Drug abuse and dependence – nature of drug dependence – nicotine, ethanol and cannabis</p>	12
<b>References</b>	<p><b>Text Books</b></p> <p>1. Jayashree Ghosh. A Textbook of Pharmaceutical Chemistry. S.Chand (2014). 2. P. L. Soni, Textbook of Organic Chemistry, Sultan Chand (1983).</p> <p><b>Reference Books</b></p> <p>1. H. P. Rang, J.M. Ritter, R.J. Flower, and G. Henderson. Rang &amp; Dale's Pharmacology, 8<sup>th</sup> Edition. Elsevier (2015). 2. Ashutosh Kar, Medicinal Chemistry Paperback –1 Nov 2018, Seventh edition, New Age International Publishers (2018).</p>	
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: state and explain the terminology of drugs. CO2: explain the fundamental knowledge about the nature of drugs, drug activity, structure-activity relationship, and drug synthesis. CO3: discuss a basic idea of drugs used for treating various diseases. CO4: discuss the uses of drugs in chemotherapy. CO5: identify the compositions and drugs used in blood.</p>	

### Mapping Course outcome with

Outcomes		PSO					PO								Sum of COs With PSOs & POs
		1	2	3	4	5	1	2	3	4	5	6	7	8	
CO	1	2	2	2	3	2	2	3	-	-	3	2	2	-	23
	2	3	2	3	2	2	3	2	-	-	2	2	2	-	23
	3	2	3	3	2	2	2	2	-	-	2	2	2	-	22
	4	3	3	2	2	2	3	2	-	-	2	3	2	-	24
	5	2	2	2	2	2	2	2	-	-	2	3	2	-	21
Grand total of COs with PSOs & POs														113	
Mean value of COs with PSOs & POs = 113/50														2.26	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.26
Observation	COs of Medicinal Chemistry strongly related with PSOs and POs		

<b>Course Code &amp; Title</b>	22UCHE15 (B) Analytical Chemistry		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	V	
<b>Cognitive Levels</b>	K2, K3			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• explain the usage of chemicals and the general purification techniques. (K2, K3)</li> <li>• explain the principles and applications of different types of chromatography. (K2, K3)</li> <li>• describe the principles of titrimetric methods of analysis. (K2, K3)</li> <li>• describe the principles of gravimetric methods of analysis. (K2, K3)</li> <li>• predict and calculate the errors of analysis of experimental results. (K2, K3)</li> </ul>			

<b>UNIT</b>	<b>Contents</b>	<b>No. of Hours</b>
I	<p style="text-align: center;"><b>Unit I</b></p> <p>Storage and handling of chemicals – Toxic and poisonous chemicals – Waste and fume disposal – Precautions and first-aid procedure – Uses of different glassware – Hazard symbols – Laboratory safety measures.</p> <p>General purification techniques – Purification of solid organic compounds – Recrystallisation – Use of mixed solvents – Use of drying agents and their properties – Sublimation.</p> <p>Extraction – use of immiscible solvents – Solvent extraction – Soxhlet extraction.</p>	12

II	<p style="text-align: center;"><b>Unit II</b></p> <p>Chromatography – Principle of adsorption and partition chromatography.</p> <p>Column chromatography: Adsorbents. Classification of adsorbents – Solvents – Preparation of column – Adsorption – Recovery of substances and application.</p> <p>Thin layer Chromatography: Choice of adsorbent. Choice of solvent – Preparation of chromatogram – R<sub>f</sub> value.</p> <p>Paper chromatography: Solvent used – R<sub>f</sub> value. Factors which affect R<sub>f</sub> value. Different types paper chromatography.</p> <p>Gas chromatography: Principle. Experimental techniques and application.</p>	12
III	<p style="text-align: center;"><b>Unit III</b></p> <p>General principle of titrimetric methods of analysis – Requirements – Expressing concentration – molarity, molality, normality, weight %. Primary and secondary standards – Criteria for primary standards – Endpoint and equivalence point – Acid-base titrations – Indicators – Choice of indicators.</p> <p>Complexometric titrations: Principle – Titrations involving EDTA – General principle – Metal ion indicators and characteristics.</p> <p>Precipitation titrations: Argentometric titrations – Indicators for precipitation titrations involving silver – Determination of chloride by Volhard’s method – Adsorption indicators.</p>	12
IV	<p style="text-align: center;"><b>Unit IV</b></p> <p>Principle of gravimetric analysis – Formation of precipitates – Characteristics of precipitating agents – Choice of precipitants and conditions of precipitation – Specific and selective precipitants – DMG, oxine, cupron, cupferron, salicylaldoxime, ethylene diamine – Use of sequestering agents. Co-precipitation and post precipitation. Precipitation from homogeneous solution.</p>	12
V	<p style="text-align: center;"><b>Unit V</b></p> <p>Error analysis – Definition of terms – Absolute and relative error – Precision and accuracy – Classification of errors – Sources and elimination of errors – Significant figures and computation.</p> <p>Analysis of experimental results: Graphical method – Curve fitting – Method of least squares.</p>	12
<b>References</b>	<p><b>Text Books</b></p> <p>1. R. Gopalan, P. S. Subramanian and K. Rangarajan. Elements of Analytical Chemistry, Sultan Chand &amp; Sons.</p>	

	<p><b>Reference Books</b></p> <p>1. David T Harvey. Modern Analytical Chemistry. Mc Graw-Hill (2000).</p> <p>2. Gary D. Christian, Purnendu K. Dasgupta, Kevin A. Schug. Analytical Chemistry, 7<sup>th</sup> Edition, Wiley (2020).</p> <p>3. Harold H. Trimm. Analytical Chemistry: Methods and Applications. CRC Press (2011).</p>
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: explain the usage of chemicals and the general purification techniques.</p> <p>CO2: explain the principles and applications of different types of chromatography.</p> <p>CO3: describe the principles of titrimetric methods of analysis</p> <p>CO4: describe the principles of gravimetric methods of analysis.</p> <p>CO5: predict and calculate the errors of analysis of experimental results.</p>

#### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs with PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	2	2	2	3	2	2	2	-	-	3	2	2	-	20
	2	2	2	2	2	2	3	2	-	-	2	2	2	-	21
	3	2	3	2	2	2	2	2	-	-	2	2	2	-	21
	4	2	2	2	2	2	3	2	-	-	2	2	2	-	21
	5	2	2	2	2	2	2	2	-	-	2	2	2	-	20
Grand total of COs with PSOs & POs														103	
Mean value of COs with PSOs & POs = 103/50														2.06	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.06
Observation	COs of Polymer Chemistry strongly related with PSOs and POs		

<b>Course Code &amp; Title</b>	22UCHE15 (C) Polymer Chemistry		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	V	
<b>Cognitive Levels</b>	K2, K3			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>state and explain the terminology and classification of polymers. (K2, K3)</li> <li>explain the chemistry of polymerisation. (K2, K3)</li> <li>describe the T<sub>g</sub> and the molecular weight determination of polymers. (K2, K3)</li> <li>discuss the bond forces and the properties of polymers. (K2, K3)</li> <li>identify and discuss some of the important polymers. (K2, K3)</li> </ul>			

UNIT	Contents	No. of Hours
I	<p style="text-align: center;"><b>Unit I</b></p> Introduction to polymers – Monomers and polymers – Definition – Classification of polymers on the basis of microstructures, macrostructures and applications – Distinction among plastics, elastomers and fibers – Homo and heteropolymers – Copolymers.	12
II	<p style="text-align: center;"><b>Unit II</b></p> Chemistry of Polymerisation – Chain polymerization – Free radical, ionic, coordination and step polymerization – Polyaddition and poly condensation.	12
III	<p style="text-align: center;"><b>Unit III</b></p> Physical properties and Reactions – Glass transition temperature – Definition – Factors affecting T <sub>g</sub> . Relationship between T <sub>g</sub> and molecular weight and melting point. Importance of T <sub>g</sub> – Molecular weight of polymers – Number average, weight average, sedimentation and viscosity average molecular weights. Molecular weights and degree of polymerization. Reactions – hydrolysis, hydrogenation. Addition/ Cross-linking-vulcanisation – Polymer degradation.	12
IV	<p style="text-align: center;"><b>Unit IV</b></p> Primary and secondary bond forces in polymers – coherence energy – structure – property relationship – Mechanical properties, thermal stability, flame resistance, chemical resistance, degradability and electrical conductivity.	12

<b>V</b>	<b>Unit V</b> Important polymers – Teflon, PMMA, polyethylene, polystyrene, PAN, polyesters, polycarbonates, polyamides, polyurethanes, PVC, epoxy resins, rubber-styrene and neoprene rubbers. Phenol-formaldehyde and urea-formaldehyde resins.	12
<b>References</b>	<p><b>Text Books</b></p> <p>1. M. S. Bhatnagar. A Textbook of Polymer Chemistry. S.Chand (2004).</p> <p><b>Reference Books</b></p> <p>1. V. R. Gowariker, N. V. Viswanathan, Jayadev Sreedhar. Polymer Science. 5<sup>th</sup> Edition, New Age International (2023).</p> <p>2. B. K. Sharma. Polymer Chemistry. Goel Publishing House (2014).</p> <p>3. F. W. Billmeyer, Text Book of Polymer Science, 3<sup>rd</sup> Edition, Wiley (2007).</p>	
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: state and explain the terminology and classification of polymers.</p> <p>CO2: explain the chemistry of polymerisation.</p> <p>CO3: describe the Tg and the molecular weight determination of polymers.</p> <p>CO4: discuss the bond forces and the properties of polymers.</p> <p>CO5: identify and discuss some of the important polymers.</p>	

#### Mapping Course outcome with

Outcomes		PSO					PO								Sum of COs with PSOs & POs
		1	2	3	4	5	1	2	3	4	5	6	7	8	
<b>CO</b>	<b>1</b>	2	2	2	3	2	2	2	-	-	3	2	2	-	22
	<b>2</b>	3	2	2	2	2	3	2	-	-	2	2	2	-	22
	<b>3</b>	2	3	3	2	2	2	2	-	-	2	2	2	-	22
	<b>4</b>	2	2	2	2	2	3	2	-	-	2	3	2	-	22
	<b>5</b>	2	2	1	2	2	2	2	-	-	2	3	2	-	20
Grand total of COs with PSOs & POs														108	
Mean value of COs with PSOs & POs = 108/55														2.16	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.16
Observation	COs of Polymer Chemistry strongly related with PSOs and POs		

<b>Course Code &amp; Title</b>	22UCHE15 (D) Soil Chemistry		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	V	
<b>Cognitive Levels</b>	K2, K3			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• explain the chemical composition of earth crust. (K2, K3)</li> <li>• explain the chemistry of soil colloids. (K2, K3)</li> <li>• describe the theories and basic concepts of soil chemistry. (K2, K3)</li> <li>• discuss the fixation in soils covering specific and non-specific sorption. (K2, K3)</li> <li>• discuss the chemistry of acid and salt-affected soils. (K2, K3)</li> </ul>			

<b>UNIT</b>	<b>Contents</b>	<b>No. of Hours</b>
<b>I</b>	<p style="text-align: center;"><b>Unit I</b></p> Introduction to soil chemistry – chemical (elemental) composition of the earth’s crust and soils – elements of equilibrium thermodynamics, chemical equilibria, electrochemistry and chemical kinetics.	12
<b>II</b>	<p style="text-align: center;"><b>Unit II</b></p> Soil colloids: inorganic and organic colloids – origin of charge, concept of point of zero-charge (PZC) and its dependence on variable-charge soil components – surface charge characteristics of soils – diffuse double layer theories of soil colloids – sorption properties of soil colloids – soil organic matter – fractionation of soil organic matter and different fractions – clay-organic interactions.	12
<b>III</b>	<p style="text-align: center;"><b>Unit III</b></p> Ion exchange processes in soil – cation exchange – theories based on law of mass action, adsorption isotherms, donnan-membrane equilibrium concept, clay-membrane electrodes and ionic activity measurement, anion and ligand exchange – inner-sphere and outer-sphere surface complex formation, fixation of oxyanions – experimental methods to study ion exchange phenomena and practical implications in plant nutrition.	
<b>IV</b>	<p style="text-align: center;"><b>Unit IV</b></p> Potassium, phosphate and ammonium fixation in soils covering specific and non-specific sorption – precipitation-dissolution equilibria – step and constant-rate K; management aspects.	12

<b>V</b>	<b>Unit V</b> Chemistry of acid soils – active and potential acidity – lime potential, sub-soil acidity – chemistry of salt-affected soils and amendments – chemistry and electrochemistry of submerged soils.	12
<b>References</b>	<p><b>Text Books</b></p> <p>1. Kim H. Tan. Principles of Soil Chemistry. 4<sup>th</sup> Edition, CRC Press. (2011)</p> <p><b>Reference Books</b></p> <p>1. Shivanand Tolanur. Soil Chemistry. 2<sup>nd</sup> Edition, CBS Publishers. (2018)</p> <p>2. Saroj Kumar Sanyal. A Textbook of Soil Chemistry. Daya Publishing House. (2020)</p> <p>2. F. Knowles and J. Elphin Watkin. The Chemistry of Soils. Hall Press. (2013)</p> <p>3. D. G. Strawn, H. L. Bohn and G. A. O'Connor. Soil Chemistry. 5<sup>th</sup> Edition, Wiley-Blackwell. (2020)</p>	
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: explain the chemical composition of earth crust.</p> <p>CO2: explain the chemistry of soil colloids.</p> <p>CO3: describe the theories and basic concepts of soil chemistry.</p> <p>CO4: discuss the fixation in soils covering specific and non-specific sorption.</p> <p>CO5: discuss the chemistry of acid and salt-affected soils.</p>	

#### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs with PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	2	2	2	3	2	2	2	-	-	2	2	2	-	21
	2	2	2	2	2	2	3	2	-	-	2	2	2	-	21
	3	2	3	2	2	2	2	2	-	-	2	2	2	-	21
	4	2	2	2	2	2	2	2	-	-	2	2	2	-	20
	5	2	2	2	2	2	2	2	-	-	2	2	2	-	20
Grand total of COs with PSOs & POs														103	
Mean value of COs with PSOs & POs = 103/55														2.06	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.06
Observation	COs of Soil Chemistry strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHSL5 Fuel Chemistry		Hours	-
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	V	
<b>Cognitive Levels</b>	K2, K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• describe the classification and calorific value of fuels</li> <li>• explain the role, composition and the preparation of fuels</li> <li>• discuss the advantages and to apply the fuels</li> <li>• explain about rocket fuel, nuclear fuels and nuclear power plants in India</li> <li>• illustrate the sources and usage of alternative fuels</li> </ul>			

UNIT	Contents	No. of Hours
I	<p style="text-align: center;"><b>Classification and Calorific Value of Fuels</b></p> Fuels and Combustion - Introduction - Classification of Fuels – Calorific Value – Theoretical Calculation of Calorific Value of a Fuel Gross calorific value and net calorific value – Characteristics of a Good Fuel - Solid fuels - Wood. Coal - Classification of Coal by Rank - Selection of Coal - Analysis of Coal and its significance.	-
II	<p style="text-align: center;"><b>Role, Components and Preparation of Fuels</b></p> Types of cooking – Types of Carbonization of Coal – Role of Sulphur in Coal - Role of Ash in Coal. Gaseous fuels – Producer Gas – Water Gas – Natural Gas – Oil Gas – Biogas – Components – composition – preparation – advantages – disadvantages and applications of Coal gas – Gobar gas – LPG.	-
III	<p style="text-align: center;"><b>Quality Analysis and applications of Fuels</b></p> Liquid fuels – Petroleum – Cracking – Synthetic Petrol – Refining of Gasoline – Reforming – Knocking – Octane number of Gasoline - Diesel Engine Fuels – Diesel – Diesel index. Residual fuel oils – Asphalt – Aviation fuel – advantages – Kerosene as a fuel. Analysis and testing of liquid and gaseous fuels – Utilization of fuels – Solar power.	-
IV	<p style="text-align: center;"><b>Rocket Fuels and Nuclear Fuels</b></p> Rockets fuels – Introduction – Propellants and guided missiles. Nuclear fuels – Production of uranium and thorium compounds – production of spent nuclear fuel- Nuclear fuel cycle in India. Indian Nuclear power plants.	-
V	<p style="text-align: center;"><b>Alternative Fuels</b></p> Other sources of energy – Electricity Power – Modern Concept of Fuel - Fuels for Metallurgy. Power Alcohol – Recent Advances in Fuel	-

	Technology. Alternative Fuels – Alcohols – Promising Biofuel: An Alternative Source to Diesel and Gasoline – Control of Pollution in Refineries.
<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. B.K. Sharma. Industrial Chemistry. Goel Publishing House (2016)</li> <li>2. P.C. Jain and M. Jain, Engineering Chemistry, Dhanpat Rai &amp; Sons, Delhi (2017)</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Jayashree Ghosh. Fundamental Concepts of Applied Chemistry. S.Chand (2010)</li> <li>2. K. Bagavathi Sundari. Applied Chemistry. MJP Publishers (2006)</li> </ol>
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: outline and to discuss the classification and calorific value of fuels  CO2: identify and to explain the role, composition and the preparation of fuels  CO3: analyze the advantages and to apply the fuels  CO4: explain about rocket fuel, nuclear fuels and nuclear power plants in India  CO5: to investigate the usage of alternative fuels</p>

#### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs with PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	2	1	2	2	2	3	2	-	-	2	2	2	2	22
	2	2	3	2	2	2	2	2	-	-	2	2	2	2	23
	3	2	2	2	2	3	2	2	-	-	2	2	2	2	23
	4	2	1	3	2	2	2	2	-	-	2	2	3	2	23
	5	1	2	2	2	2	2	2	-	-	2	1	2	3	21
Grand total of COs with PSOs & POs														112	
Mean value of Cos with PSOs & POs = 112/55														2.04	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.04
Observation	COs of Fuel Chemistry strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHC86		Hours	90
	Organic Chemistry-III		Credit	5
<b>Class</b>	III B.Sc. Chemistry	Semester	VI	
<b>Cognitive Levels</b>	K2, K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• explain the preparation and reactions of heterocycles and to classify dyes and discuss its preparation (K2, K3)</li> <li>• classify carbohydrates and explain its reactions and elucidate the structural determination of alkaloids and terpenoids (K3, K4)</li> <li>• discuss and explain various rearrangements with examples (K3, K4)</li> <li>• discussing the importance of organic synthesis and pericyclic reactions (K3, K4)</li> <li>• explain the fundamentals and applications of UV-Visible Spectroscopy, IR Spectroscopy and NMR spectroscopy (K4)</li> </ul>			

<b>UNIT</b>	<b>Contents</b>	<b>No. of Hours</b>
<b>I</b>	<p style="text-align: center;"><b>Heterocyclic Compounds and Dyes</b></p> <p>Nomenclature – Preparation, properties and reactions of Pyrrole, Furan, Thiophene, Pyridine, Indole, Quinoline and Isoquinoline.</p> <p>Dyes – Theories of colour and constitution. Classification according to structure and applications – Preparation and uses of Methyl orange, Bismarck brown, Malachite green, Phenolphthalein, Fluorescein, Indigo and Alizarin</p>	18
<b>II</b>	<p style="text-align: center;"><b>Natural Products</b></p> <p>Alkaloids: General methods of isolation – General structure determination – Structural elucidation of Coniine.</p> <p>Terpenes: Classification – Occurrence – Isolation – General properties – Isoprene rule – Structural elucidation of Citral.</p> <p>Carbohydrates: Classification. Monosaccharides- Structure and properties of glucose and fructose. Epimerisation and Mutarotation – Descending, Ascending and inter-conversions of glucose and fructose.</p> <p>Disaccharides – Structure and properties of sucrose (No structural elucidation).</p> <p>Polysaccharides – Properties and Uses of Starch.</p>	18

<b>III</b>	<p style="text-align: center;"><b>Rearrangements and Reagents</b></p> <p>Rearrangements: Anionotropic and Cationotropic rearrangements. Intramolecular and intermolecular rearrangements. Mechanism of the following reactions – Pinacol-Pinacolone, Beckmann, Hoffman, Fries and Wagner-Meerwein rearrangements</p> <p>Reagents: Synthetic applications of Acetoacetic ester and Malonic ester, Grignard reagents, Gilman's reagent.</p>	18
<b>IV</b>	<p style="text-align: center;"><b>Organic Synthesis and Pericyclic reactions</b></p> <p>Organic Synthesis: Importance of organic synthesis, Carbon-Carbon bond forming reactions-Michael addition, Aldol and benzoin condensations, Fittig reaction, Wittig reaction. Retrosynthesis-Introduction, Definition- Disconnection, Synthons, Synthetic equivalent, Functional group Interconversion. Pericyclic reactions: Definition, classification- electrocyclic, cycloaddition and sigmatropic reactions. Mechanism of Diels-Alder reactions, Cope and Claisen rearrangements.</p>	18
<b>V</b>	<p style="text-align: center;"><b>Spectrometric Identification of Organic Compounds</b></p> <p>UV-Visible Spectroscopy: Types of electronic transition. Chromophore, Auxochrome. Bathochromic, Hypsochromic, Hyperchromic and Hypochromic shifts. UV spectrum of conjugated dienes. Carbonyl compounds. Woodward-Fieser rules applied to conjugated dienes and <math>\alpha,\beta</math>-unsaturated carbonyl compounds. Simple examples.</p> <p>IR Spectroscopy: Molecular Vibrations. Fingerprint region. Characteristic absorption of functional groups. Applications of IR spectroscopy.</p> <p>NMR Spectrum: Fundamental concepts. Chemical shift. Shielding and de-shielding. Area of signals. Spin-Spin splitting. Coupling constants. Interpretation of PMR spectra of Ethyl bromide, Ethanol, Acetaldehyde.</p>	18
<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. B. S. Bahl &amp; Arun Bahl. Advanced Organic Chemistry. S. Chand. 6<sup>th</sup> Edition (2022).</li> <li>2. P. S. Kalsi. Spectroscopy of Organic compounds. New Age International, (2007)</li> <li>3. P.Y. Bruce. Organic Chemistry. Seventh Edition, Pearson. (2014)</li> <li>4. S.N Sanyal, Reactions, Rearrangements &amp; Reagents. 4<sup>th</sup> Edition, Bharati and Bhawan Publishers and Distributors (2019).</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Morrison Boyd &amp; Bhattacharjee. Organic Chemistry. Pearson Education. 7<sup>th</sup> Edition (2010).</li> <li>2. William Kemp. Organic Spectroscopy. Third Edition. Sixth Reprint. Palgrave (2002)</li> </ol>	

<b>Course Outcomes (COs)</b>	<b>On completion of the course, students will be able to</b> CO1: explain the preparation and reactions of heterocycles and to classify dyes and discuss its preparation CO2: classify carbohydrates and explain its reactions and elucidate the structural determination of alkaloids and terpenoids CO3: discuss and explain various rearrangements with examples CO4: discussing the importance of organic synthesis and pericyclic reactions CO5: explain the fundamentals and applications of UV-Visible Spectroscopy, IR Spectroscopy and NMR spectroscopy
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### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs With PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	3	2	3	3	2	3	3	-	-	3	2	2	2	28
	2	2	3	3	2	2	2	2	-	-	2	2	2	2	24
	3	2	2	2	2	2	2	2	-	-	1	2	2	2	21
	4	3	2	2	2	2	2	1	-	-	2	2	2	2	22
	5	2	2	2	2	2	3	2	-	-	2	1	2	2	22
Grand total of COs With PSOs & POs														117	
Mean value of COs With PSOs & POs = 117/55														2.13	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.13
Observation	COs of Organic Chemistry-III strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHC96 Inorganic Chemistry-III		Hours	75
			Credit	5
<b>Class</b>	III B.Sc. Chemistry	Semester	VI	
<b>Cognitive Levels</b>	K2, K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• describe the characteristics and properties of transition &amp; inner transition elements (K2, K3)</li> <li>• outline the nomenclature and to classify coordination compounds (K2, K3)</li> <li>• define and describe the bonding and properties of coordination compounds (K2, K3)</li> <li>• describe the reaction mechanism of coordination compounds and the chemistry of metal carbonyls (K3, K4)</li> <li>• predict and explain the role of metal complexes in biological systems (K3)</li> </ul>			

<b>UNIT</b>	<b>Contents</b>	<b>No. of Hours</b>
<b>I</b>	<p style="text-align: center;"><b>Transition &amp; Inner Transition Elements</b></p> <p>First, second and third transition series – General characteristics – Metallic character, atomic and ionic radii – oxidation states, color, complex formation, catalytic and magnetic properties – Non-stoichiometric compounds Preparation, properties and uses of potassium dichromate, potassium permanganate and manganese dioxide</p> <p>Lanthanides - Electronic Structure &amp; Oxidation States. Magnetic Properties. Spectral Properties. Lanthanide contraction.</p> <p>Actinides – Electronic Structure &amp; Oxidation States – Magnetic Properties – Actinide contraction.</p>	15
<b>II</b>	<p style="text-align: center;"><b>Introduction to Coordination Compounds</b></p> <p>Double salts – complex compounds – complex ion and coordination number – Nomenclature. Types of ligands – Chelation – chelate effect. Factors affecting Chelation. Structure of EDTA and DMG. Isomerism in coordination compounds: Structural Isomerism – ionization, hydration, linkage, coordination, ligand, polymerization. Stereo Isomerism – geometrical and optical isomerism. Werner's theory – Sidgwick's electronic interpretation – EAN concept.</p>	15

<b>III</b>	<p style="text-align: center;"><b>Bonding in Coordination Compounds</b></p> <p>Theories: Valence Bond Theory (VBT) – postulates, prediction of hybridization, geometry, and magnetic moment – Uses and Limitations of VBT.</p> <p>Crystal Field Theory (CFT) – postulates, splitting of d orbitals under different geometries – octahedral, tetrahedral and square planar – spectrochemical series – High-spin &amp; Low-spin complexes – CFSE – calculation – factors affecting CFSE – Colour of complexes – d-d transition, charge transfer (LMCT &amp; MLCT) – Jahn-Teller distortion – Uses and Limitations of CFT.</p>	15
<b>IV</b>	<p style="text-align: center;"><b>Reaction Mechanism in Coordination Compounds &amp; Bonding in Metal Carbonyls</b></p> <p>Substitution reactions of octahedral complexes – <math>S_N1</math>, <math>S_N2</math>. Acid and Base hydrolysis of Octahedral complexes. <i>Electron transfer reactions</i>: Outer-sphere and Inner sphere electron transfer reactions – Marcus theory – complementary and non-complementary reactions. Substitution reactions of square-planar complexes – Trans effect – theories – trans-directing series – application of trans-effect in preparation of cis &amp; trans complexes.</p> <p>Metal Carbonyls – structure and bonding – EAN rule and its application to the carbonyls of V, Cr, Mn, Fe, Co and Ni. – General methods of preparation of carbonyls – direct combination and reductive carbonylation</p>	15
<b>V</b>	<p style="text-align: center;"><b>Bioinorganic Chemistry</b></p> <p>Introduction. Role of metal ions in biological systems - Metal complexes in biological systems – chlorophyll, cyanocobalamin. Iron containing oxygen carriers – Introduction. Myoglobin and hemoglobin. Structure of the prosthetic group. Mechanism of binding of oxygen and CO to myoglobin and hemoglobin. Copper containing enzyme – Structure and functions of superoxide dismutase (SOD). Zinc containing enzyme – Structure and functions of carbonic anhydrase.</p>	15

<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. R. Gopalan, V. Ramalingam, Concise Coordination Chemistry, 1<sup>st</sup> Edition, Vikas Publishing House (2001)</li> <li>2. Modern Inorganic Chemistry, 4<sup>th</sup> Edition. R. D. Madan. S. Chand (2006)</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. J. E. Huheey, E. A. Keiter, R. L. Keiter, O. K. Medhi, Inorganic Chemistry – Principles of Structure and Reactivity, 4<sup>th</sup> Edition, Pearson Education (2008).</li> <li>2. B. R. Puri, L. R. Sharma, K. C. Kalia, Principles of Inorganic Chemistry, 33<sup>rd</sup> Edition, Milestone Publishers &amp; Distributors (2016).</li> <li>3. R. M. Roat-Malone, Bioinorganic Chemistry – A Short Course, John Wiley &amp; Sons (2013).</li> </ol>
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: describe the characteristics and properties of transition &amp; inner transition elements</p> <p>CO2: outline the nomenclature and to classify coordination compounds</p> <p>CO3: define and describe the bonding and properties of coordination compounds</p> <p>CO4: describe the reaction mechanism of coordination compounds and the chemistry of metal carbonyls</p> <p>CO5: predict and explain the role of metal complexes in biological systems</p>

#### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs with PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	3	2	3	3	2	3	3	-	-	3	2	2	2	28
	2	2	3	3	2	2	2	2	-	-	2	2	2	2	24
	3	2	2	2	2	2	2	2	-	-	2	2	2	2	22
	4	3	2	2	2	2	2	1	-	-	2	2	2	2	22
	5	2	2	2	3	2	3	2	-	-	2	2	2	2	24
Grand total of COs with PSOs & POs														120	
Mean value of COs with PSOs & POs = 114/55														2.18	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.18
Observation	COs of Inorganic Chemistry-III strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHD06 Physical Chemistry-III		Hours	75
			Credit	5
<b>Class</b>	III B.Sc. Chemistry	Semester	VI	
<b>Cognitive Levels</b>	K2, K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• identify the various electrolytes, electrolytic conductance and determination of ionic mobilities (K2, K3)</li> <li>• define and to describe the basics of electrodes, electrode potential and electrochemical cells and to calculate the pH using various electrodes. (K2, K3)</li> <li>• Discuss and basic principle of adsorption, surface phenomena and colligative properties (K2, K3)</li> <li>• state the basic concepts of Group Theory and construct the group multiplication table. (K2, K4)</li> <li>• discuss and to apply the principles of instrumentation of spectroscopic techniques- Microwave, IR, Raman, and NMR (K2, K3)</li> </ul>			

UNIT	Contents	No. of Hours
I	<p style="text-align: center;"><b>Electrolytes – Electrolytic Conductance</b></p> <p>Electrolytic conduction. Faradays law of electrolysis. Specific equivalent and molar conductance. Variation of conductance with dilution. Strong and weak electrolytes. Ionic mobility. Determination of ionic mobilities. Transport number. Determination of transport number by Hittorf and moving boundary method. Kohlrausch's law and its Applications. Ostwald's dilution law. Theory of strong electrolytes – Debye-Huckel theory. Onsager equation and its significance. Applications of conductance measurements: Conductometric titrations (Strong Acid Vs Strong Base, Weak Acid Vs Strong Base and Mixer of acids).</p>	15
II	<p style="text-align: center;"><b>Electrochemical Cells</b></p> <p>Reversible and irreversible cells. Galvanic cells – Single electrode potential - Emf and its measurements. Standard cells. Electrode reactions -Standard electrode potentials – Electrochemical series and its significance -Sign convention –Thermodynamics of reversible electrodes and cells -Derivation of Nernst equation for emf of cells. Reference electrodes – Standard hydrogen, Calomel. Concentration cells with and without transference. Liquid junction</p>	15

	potentials. Applications of emf measurements: Determination of pH using Glass electrodes – Determination of solubility product. Potentiometric titrations- redox titrations. Fe <sup>2+</sup> Vs Cr <sup>3+</sup>	
III	<p style="text-align: center;"><b>Surface Chemistry and Colligative Properties</b></p> <p>Adsorption: adsorption phenomena, physisorption and chemisorption, Freundlich and Langmuir Adsorption, factors affecting adsorption and applications – catalysis: characteristics of catalysts, types of catalytic reactions – homogeneous and heterogeneous catalysts – autocatalysis.</p> <p>Colligative properties: types of colloids – Preparation: Dispersion method &amp; Condensation methods – Purification of colloids – properties – Electrophoresis and Electroosmosis - applications.</p> <p>Colligative properties – Definition – Relative lowering of Vapour pressure – osmotic pressure – elevation of boiling point – depression of freezing point – abnormal results and the van't Hoff factor.</p>	15
IV	<p style="text-align: center;"><b>Group Theory</b></p> <p>Molecular symmetry- Types of Symmetry elements - symmetry operations - Products of symmetry operations. Properties of group-classes and subgroups. Construction of Group Multiplication table – NH<sub>3</sub> and H<sub>2</sub>O molecules. Point groups – C<sub>nv</sub>, C<sub>nh</sub>, D<sub>nh</sub> – Identification and determination – comparison of molecular and crystallographic symmetry.</p>	15
V	<p style="text-align: center;"><b>Spectroscopy</b></p> <p>Molecular Spectroscopy: Introduction – Regions of the electromagnetic spectrum. Microwave spectroscopy: Rotation of molecules. Rotational spectrum of simple diatomic molecules. IR Spectroscopy: Vibration of diatomic molecules – Types of vibrations. Raman Spectroscopy: Introduction – Molecular polarisability – Selection rules – Mutual exclusion principle – Magnetic resonance: Theory of PMR spectroscopy – Instrumentation. Chemical shift and Spin-Spin coupling.</p>	15
References	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. Puri, Sharma &amp; Pathania. "Principles of Physical Chemistry". 1<sup>st</sup> edition, Vishal Publishing &amp; Co (2018).</li> <li>2. Puri, Sharma "Principles of Physical chemistry", 46<sup>th</sup> edition, Vishal Publishing &amp; Co (2013).</li> <li>3. ArunBahl &amp; B. S. Bahl, "Essentials of Physical Chemistry, 28<sup>th</sup> edition, S. Chand Publishing (2020).</li> <li>4. K. V. Raman, "Group Theory and its Applications to Chemistry" Tata McGraw-Hill Publishing Company, 3<sup>rd</sup> edition (1990)</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. S. K. Dogra &amp; S. Dogra. "Physical Chemistry through Problems", 2<sup>nd</sup></li> </ol>	

	<p>Edition. New Age International (2015).</p> <p>2. Colin N. Banwell, Elaine M. McCash, Fundamentals of Molecular Spectroscopy, 4<sup>th</sup> Edition, McGraw Hill Publications (2017).</p> <p>3. R. GurdeepChatwall, Advanced Physical Chemistry, Goel publishing (2016).</p> <p>4. K. Veera Reddy, "Symmetry And Spectroscopy Of Molecules", New Age International (1998)</p>
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: identify the various electrolytes, electrolytic conductance and determination of ionic mobilities.</p> <p>CO2: state and derive ionic equilibria, explain the principles of pH, buffer solutions and salt hydrolysis.</p> <p>CO3: define and to describe the basics of electrodes, electrode potential and electrochemical cells and to calculate the pH using various electrodes.</p> <p>CO4: discuss and to apply the principles of instrumentation of spectroscopic techniques – Microwave, IR, Raman, NMR and ESR.</p> <p>CO5: state the basic concepts of Group Theory and construct the group multiplication table.</p>

#### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs with PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	2	2	3	3	2	3	3	-	-	3	2	2	-	25
	2	2	2	2	2	2	3	2	-	-	2	2	2	-	21
	3	2	2	2	2	2	2	3	-	-	2	2	2	-	21
	4	2	2	2	3	2	2	2	-	-	3	3	3	-	24
	5	3	3	3	2	2	2	2	-	-	2	2	2	-	23
Grand total of COs with PSOs & POs														114	
Mean value of COs with PSOs & POs = 114/55														2.07	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.07
Observation	COs of Physical Chemistry-III strongly related with PSOs and POs		

<b>Course Code &amp; Title</b>	22UCHP56 Gravimetry and Preparation		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	VI	
<b>Cognitive Levels</b>	K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>estimate the metals lead and barium as their salts gravimetrically (K4)</li> <li>estimate the metals calcium and copper as their salts gravimetrically (K4)</li> <li>prepare and to recrystallise simple inorganic compounds (K3, K4)</li> <li>prepare and to recrystallise inorganic complex compounds (K3, K4)</li> </ul>			

UNIT	Contents	No. of Hours
I	<p align="center"><b>Gravimetry-I</b></p> Estimation of lead as lead chromate Estimation of barium as barium chromate Estimation of barium as barium sulphate	60
II	<p align="center"><b>Gravimetry-II</b></p> Estimation of calcium as calcium oxalate monohydrate Estimation of copper as CuSCN	
III	<p align="center"><b>Inorganic preparations-I</b></p> Potash alum Chrome alum Prussian blue	
IV	<p align="center"><b>Inorganic preparations-II</b></p> Tetraamminecopper(II) sulphate Trithioureacopper(I) chloride Hexaamminecobalt(III) chloride	
<b>References</b>	<p><b>Text Books</b></p> 1. Jeyavarthana Samuel, Chemistry Practical Book, S.S. Printers (2018)	
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> CO1: identify the suitable precipitating agent and methodology for the quantitative estimate of metal ions gravimetrically CO2: estimate the amount of various metals like lead, barium, calcium and copper in real samples. CO3: prepare pure simple inorganic compounds CO4: prepare pure inorganic complex compounds	

### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs With PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	3	2	3	3	3	3	3	-	-	3	3	3	2	31
	2	3	3	3	3	2	3	3	-	-	2	3	3	2	30
	3	3	3	2	3	3	3	2	-	-	3	3	3	2	30
	4	3	3	3	2	3	3	3	-	-	3	2	3	2	30
Grand total of COs with PSOs & POs														121	
Mean value of COs with PSOs & POs = 121/44														2.75	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.75
Observation	COs of Gravimetry and Preparation strongly related with PSOs and POs		

### EVALUATION

#### Continuous Internal Assessment (50 Marks)

S. No.	Components	Marks
1.	Regular practical Observation & Viva	10
2.	Results of the regular practical – Gravimetry	10
3.	Results of the regular practical – Preparation	10
4.	Internal Test-I	10
5.	Internal Test-II	10
	<b>TOTAL</b>	<b>50</b>

#### End-Semester Examination (50 Marks)

S. No.	Components	Marks
1.	Record Notebook & Viva	10
2.	Procedure – Gravimetry & Preparation	10
3.	Experiment – Final Result within the prescribed error limit	20
4.	Preparation – Final Result	10
	<b>TOTAL</b>	<b>50</b>

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHP66		Hours	60
	Physical Chemistry Practical		Credit	3
<b>Class</b>	III B.Sc. Chemistry	<b>Semester</b>	VI	
<b>Cognitive Levels</b>	K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• determine molecular weight of the unknown solute by Transition temperature and Rast's method (K3, K4)</li> <li>• comprehend and calculate critical solution temperature (CST) of phenol –water system and how impurities influence CST (K3, K4)</li> <li>• calculate the rate constant of hydrolysis of ester by mineral acids and also their relative strength of the acids (K3, K4)</li> <li>• calculate the strength of the base or acid by Conductometric Titration (K3, K4)</li> <li>• calculate the strength of the acid or base by Potentiometric Titration (K3, K4)</li> </ul>			

UNIT	Contents	No. of Hours
I	<p style="text-align: center;"><b>Determination of molecular weights</b></p> (a) Transition temperature method – Using sodium thiosulphate pentahydrate as the solvent. (b) Cryoscopic method – Rast's method using Naphthalene as the solvent	60
II	<p style="text-align: center;"><b>Phase equilibria</b></p> (a) Determination of CST of phenol-water system (b) Estimation of NaCl by studying the CST of phenol-water system (c) Construction of phase diagrams – Two component systems (i) Simple eutectic	
III	<p style="text-align: center;"><b>Chemical kinetics</b></p> Determination of rate constant of hydrolysis of methyl/ethyl acetate by an acid. (Ester Hydrolysis)	
IV	<p style="text-align: center;"><b>Electrochemistry</b></p> <b>Conductometric titration</b> Strong Acid Vs Strong Base (HCl Vs NaOH)	
V	<b>Potentiometric titrations:</b> Redox Titration (FAS Vs $K_2Cr_2O_7$ )	

<b>References</b>	<b>Text Books</b> 1. Jeyavarthana Samuel, Chemistry Practical Book, S.S. Printers (2018) 2. D. N. Bajpai, O. P. Pandey & S. Giri "Practical Chemistry" S.Chand Publishing (2013)
<b>Course Outcomes (COs)</b>	<b>On completion of the course, students will be able to</b> CO1: describe and explain the theory and underlying concepts of physical chemistry CO2: apply knowledge of physical chemistry to select the appropriate technique for the determination of physical parameters CO3: examine the procedures and instrumental methods applied in analytical and practical tasks of physical chemistry CO4: analyze, interpret and predict data to solve conceptual and theoretical problems, including those from experimental work CO5: critically evaluate data, maintain a detailed scientific notebook and summarize findings in writing in a clear and concise manner

#### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs With PSOs & POs
	1	2	3	4	5	1	2	3	4	5	6	7	8	
CO	1	3	3	3	3	3	3	-	-	3	3	3	2	32
	2	3	2	2	3	3	3	-	-	3	3	3	2	29
	3	2	2	3	3	3	3	-	-	3	3	3	2	29
	4	3	3	3	3	3	3	-	-	3	3	3	2	32
	5	2	3	3	3	3	3	-	-	3	3	3	2	31
Grand total of COs with PSOs & POs													153	
Mean value of COs with PSOs & POs = 153/55													2.78	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.78
Observation	COs of Physical Chemistry Practical strongly related with PSOs and POs		

*Continuous Internal Assessment (50 Marks)*

<b>S. No.</b>	<b>Components</b>	<b>Marks</b>
1.	Regular practical Observation & Viva	10
2.	Results of the regular practical	20
4.	Internal Test-I	10
5.	Internal Test-II	10
	<b>TOTAL</b>	<b>50</b>

*End-Semester Examination (50 Marks)*

<b>S. No.</b>	<b>Components</b>	<b>Marks</b>
1.	Record Notebook & Viva	10
2.	Procedure	10
3.	Calculation and Graph	10
4.	Experiment – Final Result within the prescribed error limit	20
	<b>TOTAL</b>	<b>50</b>

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHE26 (A) Industrial Chemistry		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	VI	
<b>Cognitive Levels</b>	K2, K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• describe the basic process involved in petrochemical industries (K2, K3)</li> <li>• explain the process involved in manufacturing of sugar in sugar industry (K2, K3)</li> <li>• define and classify various ingredients in fertilizers and pesticides (K2, K3)</li> <li>• explain the process of water treatment methods (K2, K3)</li> <li>• illustrate the principle and applications of green chemistry (K3, K4)</li> </ul>			
<b>UNIT</b>	<b>Contents</b>			<b>No. of Hours</b>
I	<p style="text-align: center;"><b>Petrochemicals</b></p> <p>Fuel-Characteristics, Classification, Crude oil-Constitution, composition, classification, refining and fractional distillation. Composition of different distillates. Manufacture of synthetic petrol-Bergius and Fischer-Tropsch processes – Ignition point, flash point, Knocking, Anti-knocking agent/leaded petrol, octane number, and cetane number. Cracking. Manufacture of petrochemicals-ethanol, ethyleneglycol, glycerine, phenol, isopropanol.</p>			12
II	<p style="text-align: center;"><b>Sugar Industry</b></p> <p>Sugar Industry in Tamilnadu and India. Sugar cane and sugar beet – manufacture of cane sugar. Extraction of juice – concentration – separation of crystals – sulphitation and carbonation – testing and estimation of sugar. Bagasse – use of Bagasse for the manufacture of paper and electricity.</p>			12
III	<p style="text-align: center;"><b>Fertilizers and Pesticides</b></p> <p>Fertilizer – Classification, sources, Granulation. Nitrogenous Fertilizer – urea, Ammonium nitrate – Phosphate Fertilizer-Normal super phosphate and Triple super phosphate. Potassium Fertilizer – potassium nitrate – Mixed fertilizer–NPK – Effect of fertilizer, Fertilizer industry in India. Insecticides and pesticides – Definition, Classification. Inorganic insecticides- Lead arsenate, Calcium arsenate, Paris</p>			12

	Green, Lime, sulphur, hydrocyanic acid. Natural Insecticides – Nicotine, Pyrethrins, Rotenone, Allethrin. Organic insecticides- DDT, BHC – Fungicides – Repellants – Pollution caused and effect of pesticides.	
<b>IV</b>	<p style="text-align: center;"><b>Water Treatment</b></p> <p>Introduction: Hardness of Water – temporary and permanent hardness – units of hardness – disadvantages of hardness. Estimation of hardness – EDTA method.</p> <p>Water softening methods: sedimentation, coagulation, filtration -removal of microorganisms – chlorination, UV irradiation and ozonation. Ion exchange – Permutit process- demineralization – deionization process. Reverse Osmosis. BOD and COD</p>	12
<b>V</b>	<p style="text-align: center;"><b>Principles of Green Chemistry</b></p> <p>Definition – Need for Green chemistry – Difference between Green Chemistry and Environmental Chemistry – Waste minimization techniques – 12 principles of green chemistry. One example illustrating each principle.</p> <p>Green synthesis Methods – Ultra sonication, Microwave assisted solvent free synthesis – Applications – PTC.</p>	12
To visit to the above industries and to submit the report of the same.		
<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. B. K. Sharma, "Industrial Chemistry" Goel Publishing House (2019)</li> <li>2. H. L. White, "Introduction to Industrial Chemistry". John Wiley (2015)</li> <li>3. H. Krishnamoorthy, "Engineering Chemistry" 2<sup>nd</sup> Edition (2019)</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Schreve, "Chemical Process Industries", McGraw Hill (2015)</li> <li>2. V. K. Ahluwalia, "Green Chemistry", Narosa Publishing House (2012)</li> <li>3. Balasubramaniam, "Applied Chemistry" 2<sup>nd</sup> Edition (2022)</li> </ol>	
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1:describe the basic process involved in petrochemical industries</p> <p>CO2:explain the process involved in manufacturing of sugar in sugar industry</p> <p>CO3:define and classify various ingredients in fertilizers and pesticides</p> <p>CO4:explain the process of water treatment methods</p> <p>CO5:illustrate the principle and applications of green chemistry</p>	

### Mapping Course outcome with

Outcomes		PSO					PO								Sum of COs with PSOs & POs
		1	2	3	4	5	1	2	3	4	5	6	7	8	
CO	1	2	3	2	2	2	3	2	3	-	2	2	2	-	25
	2	2	3	2	1	2	2	2	2	-	2	3	2	-	23
	3	3	2	2	2	2	2	3	2	-	2	3	2	-	25
	4	2	2	2	3	2	2	2	2	-	2	2	2	-	23
	5	3	2	3	2	2	3	3	3	-	2	2	2	-	27
Grand total of COs with PSOs & POs														123	
Mean value of COs with PSOs & POs = 123/55														2.24	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.24
Observation	COs of Industrial Chemistry strongly related with PSOs and POs		

<b>Course Code &amp; Title</b>	22UCHE26 (B) Pharmaceutical Chemistry		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	VI	
<b>Cognitive Levels</b>	K2, K3			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>state and explain the terminology of drugs. (K2, K3)</li> <li>explain the principles of drug synthesis. (K2, K3)</li> <li>describe how to treat various diseases. (K2, K3)</li> <li>discuss the basic principles and the molecular basis of chemotherapy. (K2, K3)</li> <li>describe the characteristic features of blood. (K2, K3)</li> </ul>			

UNIT	Contents	No. of Hours
I	<p style="text-align: center;"><b>Unit I</b></p> Introduction – history of medicinal chemistry – different systems of medicine-ayurveda, siddha, homeopathy and allopathy – Terminology – pharmacy, pharmacology, pharmacognosy, pharmacophore, pharmacodynamics, antimetabolites – discovery of drugs – sources of drugs – classification of drugs – mechanism of drug action and metabolism of drugs.	12
II	<p style="text-align: center;"><b>Unit II</b></p> Principles of drug discovery and synthesis – lead compounds – Synthetic considerations – use of computers in drug design – relationship between chemical structure and pharmacological activity – effect of unsaturation, chain length-isomerism functional group-hydroxyl-alkyl – shortage of pharmaceutical substances – temperature – humidity – gases – light – containers – encapsulation.	12
III	<p style="text-align: center;"><b>Unit III</b></p> Analgesics, antipyretics and anti-inflammatory Agents – classification based on structure – salicylates – paracetamol – opioid analgesics – morphine and its analogues. NSAID – anxiolytic drugs – definition – anxiety – classification. benzodiazepines and barbiturates.	12
IV	<p style="text-align: center;"><b>Unit IV</b></p> Chemotherapy – basic principles of chemotherapy – molecular basis of chemotherapy – antibacterials – sulphonamides – antibiotics – beta-lactam antibiotics, tetracyclins, chloramphenicol, aminoglycosides, macrolides and flouroquinolones.	12

<b>V</b>	<b>Unit V</b> Blood – composition-grouping – Rh factor – buffers in blood – functions of plasma proteins – clotting mechanism – blood pressure, hypertension – cause, prevention and treatment, antihypertensive agents – aldomet and reserpine coagulants and anticoagulants – definition and examples.	12
<b>References</b>	<p><b>Text Books</b></p> <p>1. Jayashree Ghosh. A Textbook of Pharmaceutical Chemistry. S.Chand (2010).</p> <p><b>Reference Books</b></p> <p>1. H. P. Rang, J.M. Ritter, R. J. Flower, and G. Henderson. Rang &amp; Dale's Pharmacology. 8<sup>th</sup> Edition, Elsevier (2015).</p> <p>2. Ashutosh Kar, Medicinal Chemistry. 7<sup>th</sup> Edition, New Age International (2018).</p> <p>3. David G. Watson. Pharmaceutical Chemistry. Churchill Livingstone Elsevier. (2011)</p> <p>4. N. V. Chenchu Lakshmi. Pharmaceutical Inorganic Chemistry: Theory and Practice. Pearson. (2012)</p>	
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: state and explain the terminology of drugs.</p> <p>CO2: explain the principles of drug synthesis.</p> <p>CO3: describe how to treat various diseases.</p> <p>CO4: discuss the basic principles and the molecular basis of chemotherapy.</p> <p>CO5: describe the characteristic features of blood.</p>	

#### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs With PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
<b>CO</b>	<b>1</b>	2	2	2	3	2	2	3	-	-	2	2	2	-	22
	<b>2</b>	3	2	2	2	2	3	2	-	-	2	2	2	-	22
	<b>3</b>	2	3	3	2	2	2	2	-	-	2	2	2	-	22
	<b>4</b>	3	3	2	2	2	2	2	-	-	2	3	2	-	23
	<b>5</b>	2	2	2	2	2	2	2	-	-	2	3	2	-	21
Grand total of COs with PSOs & POs														110	
Mean value of COs with PSOs & POs = 110/50														2.20	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.20
Observation	COs of Pharmaceutical Chemistry strongly related with PSOs and POs		

<b>Course Code &amp; Title</b>	22UCHE26 (C) Environmental Chemistry		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	VI	
<b>Cognitive Levels</b>	K2, K3			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>state and explain the terminology and basic concepts of environmental chemistry. (K2, K3)</li> <li>describe the sources and harmful effects of air pollution. (K2, K3)</li> <li>describe the types, sources and harmful effects of water pollution. (K2, K3)</li> <li>describe the types, sources and harmful effects of soil pollution. (K2, K3)</li> <li>analyse the air and water quality parameters. (K2, K3)</li> </ul>			

UNIT	Contents	No. of Hours
I	<p style="text-align: center;"><b>Unit I</b></p> Introduction to environmental chemistry – ecology – ecosystem – cycling of mineral elements and gases – carbon cycle – hydrogen cycle – nitrogen cycle – pollution and its types – effects and control – remedial measures.	12
II	<p style="text-align: center;"><b>Unit II</b></p> Air Pollution – introduction – sources of air pollution – air pollutants – classification and effects of air pollutions – oxides of nitrogen, sulphur and carbon – acid rain – effects – green house effect – global warming – effects and control – ozone layer – ozone depletion – chlorofluoro carbons – effects and control photochemical smog – effects and control – fly ash – effects and control.	12
III	<p style="text-align: center;"><b>Unit III</b></p> Water Pollution – introduction – types of water – water pollution – sources of water pollution – water pollutants – classification – physical, chemical and biological – inorganic pollutants and toxic metals – organic pollutants – radioactive pollutants in water-pesticides and fertilizers – suspended particles – water quality – water quality index – ill effects of water pollutants – fluorosis – water pollution control – water treatment – desalination – reverse osmosis – sewage and industrial waste water treatment.	12

<b>IV</b>	<b>Unit IV</b> Soil Pollution – introduction – types of soil – soil pollution – types – indicators of soil pollution – plants as indicators of pollution – sources of soil pollution – fertilizers and pesticides – radioactive pollutants – solid wastes – soil sediments as pollutant – soil erosion – treatment of soil pollutants – treatment of solid wastes – remedial measures for soil pollution.	12
<b>V</b>	<b>Unit V</b> Analysis of air pollutants – units – sampling – devices and methods for sampling – measurement – analysis of water pollutants – units – sampling – devices and methods for sampling – measurement: UV Visible spectrometry – titration – analysis of different water quality parameters – BOD-COD – analysis and monitoring of pesticides and industrial pollutants.	12
<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. Anil Kumar De. Environmental Chemistry. 7<sup>th</sup> Edition, New Age International. (2007)</li> <li>2. B. K. Sharma and H. Kaur, Environmental Chemistry, Goel Publishing House (2014).</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. V. Subramanian. A Textbook of Environmental Chemistry. Wiley Publications. (2020)</li> <li>2. Ashutosh Kar, Medicinal Chemistry. 7<sup>th</sup> Edition, New Age International (2018).</li> <li>3. Arvind Kumar and Manish C. Varma. Environmental Pollution and Health Hazards. A.P.H. Publishing Corporation. (2009)</li> <li>4. N. Manivasakam, Physicochemical Examination of Water, Sewage and Industrial Effluents, 2<sup>nd</sup> Edition, Pragati Prakashan. (2000)</li> </ol>	
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: state and explain the terminology and basic concepts of environmental chemistry.</p> <p>CO2: describe the sources and harmful effects of air pollution.</p> <p>CO3: describe the types, sources and harmful effects of water pollution.</p> <p>CO4: describe the types, sources and harmful effects of soil pollution.</p> <p>CO5: analyse the air and water quality parameters.</p>	

### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs With PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	2	2	2	3	2	2	3	-	-	2	2	2	-	22
	2	3	2	2	2	2	3	2	-	-	2	2	2	-	22
	3	2	3	3	2	2	2	2	-	-	2	2	2	-	22
	4	3	2	2	2	2	2	2	-	-	2	3	2	-	22
	5	2	2	2	2	2	2	2	-	-	2	2	2	-	20
Grand total of COs with PSOs & POs														108	
Mean value of COs with PSOs & POs = 108/50														2.16	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.16
Observation	COs of Environmental Chemistry strongly related with PSOs and POs		

<b>Course Code &amp; Title</b>	22UCHE26 (D) Nutritional Chemistry		Hours	60
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	VI	
<b>Cognitive Levels</b>	K2, K3			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• explain the relationship between nutrition and human health. (K2, K3)</li> <li>• describe the functions, importance of nutrients. (K2, K3)</li> <li>• analyse the metabolism of nutrients. (K2, K3)</li> <li>• apply the basic principles of biochemistry to nutrition. (K2, K3)</li> <li>• analyse the importance of nucleic acids &amp; hormones. (K2, K3)</li> </ul>			

<b>UNIT</b>	<b>Contents</b>	<b>No. of Hours</b>
<b>I</b>	<p align="center"><b>Unit I</b></p> <p>Introduction to nutrition – Food as source of nutrients, Food classification based on nutritive values function of foods – definition of nutrition, nutrients, adequate, optimum and good nutrition, malnutrition – Inter-relationship between nutrition and health-visible symptoms of good health.</p>	12
<b>II</b>	<p align="center"><b>Unit II</b></p> <p>Energy-giving Nutrients Carbohydrates – Classification, functions, food sources, digestion, absorption and transport, Mobilization of carbohydrates – Metabolism of carbohydrates, glycolysis – Kreb cycle and storage – Effect of deficiency and excess of carbohydrates. Lipids – Classification, functions, food sources – saturated &amp; unsaturated fatty acids digestion, absorption and transport. Mobilization of fat. Effect of excess and deficiency of Lipids.</p>	12
<b>III</b>	<p align="center"><b>Unit III</b></p> <p>Body-building Nutrient Classification, functions, food sources, essential amino acids, non essential amino acid digestion, absorption and transport of amino acids, transport, mobilization of protein – Metabolism of proteins – Effects of excess and deficiency of proteins.</p>	12

IV	<p style="text-align: center;"><b>Unit IV</b></p> <p>Regulating Nutrients Minerals – functions, sources, bio-availability, and deficiency effects of minerals. Vitamins – classification, sources, units of measurement, sources, functions and deficiency effects of vitamins. Water – as a nutrient, function, sources, requirement, purification – importance of drinking water, characteristic of purified water – water as a medicine.</p>	12
V	<p style="text-align: center;"><b>Unit V</b></p> <p>Nucleic acids – RNA, DNA components, genetic code – protein biosynthesis, DNA and bioengineering. Hormones – importance of hormones, hormones in our body pituitary, adrenal, thyroid, pancreatic and reproductive hormones and their functions.</p>	12
<b>References</b>	<p><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. S. Sumathi. Food Chemistry and Nutrition. BSP Books. (2020)</li> <li>2. T. Anand and Rakesh Kumar Sharma. Food Chemistry. New Delhi Publishers. (2019)</li> </ol> <p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Harbans Lal and Rajesh Pandey. Textbook of Biochemistry. CBS Publishers and Distributers Limited. (2017)</li> <li>2. Lillian H. Meyer. Food Chemistry. CBS Publishers &amp; Distributors. (2006)</li> <li>3. Sunita Roy Chowdhury and Bani Tamber Aeri. Textbook of Food Science and Nutrition. Aarahan Publishers. (2023)</li> <li>4. B. Srilakshmi. Food Science. New Age International. (2023)</li> <li>5. Alex V. Ramani. Food Chemistry. MJP Publishers. (2024)</li> </ol>	
<b>Course Outcomes (COs)</b>	<p><b>On completion of the course, students will be able to</b></p> <p>CO1: explain the relationship between nutrition and human health. CO2: describe the functions, importance of nutrients. CO3: analyse the metabolism of nutrients. CO4: apply the basic principles of biochemistry to nutrition. CO5: analyse the importance of nucleic acids &amp; hormones</p>	

### Mapping Course outcome with

Outcomes		PSO					PO								Sum of COs with PSOs & POs
		1	2	3	4	5	1	2	3	4	5	6	7	8	
CO	1	3	2	2	3	2	2	3	-	-	2	2	2	-	23
	2	2	3	2	2	2	3	2	-	-	2	2	2	-	23
	3	2	2	3	2	2	3	2	-	-	2	2	2	-	22
	4	3	2	2	2	2	2	2	-	-	2	3	2	-	22
	5	2	2	2	2	2	2	3	-	-	2	2	2	-	21
Grand total of COs with PSOs & POs														111	
Mean value of COs with PSOs & POs = 111/50														2.22	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.22
Observation	COs of Nutritional Chemistry strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF CHEMISTRY**

<b>Course Code &amp; Title</b>	22UCHSL6 Chemistry for Competitive Exams		Hours	-
			Credit	3
<b>Class</b>	III B.Sc. Chemistry	Semester	VI	
<b>Cognitive Levels</b>	K3, K4			
<b>Course Educational Objectives (CEOs)</b>	<p><b>The course aims to make the students to</b></p> <ul style="list-style-type: none"> <li>• Justify, reason-out and apply the concepts in General Chemistry (K3, K4)</li> <li>• justify, reason-out and apply the concepts in Inorganic Chemistry (K3, K4)</li> <li>• justify, reason-out and apply the concepts in Organic Chemistry (K3, K4)</li> <li>• justify, reason-out and apply the concepts in Physical Chemistry (K3, K4)</li> <li>• justify, reason-out and apply the concepts in Applied and Analytical Chemistry (K3, K4)</li> </ul>			

<b>UNIT</b>	<b>Contents</b>	<b>No. of Hours</b>
<b>I</b>	Short answer and Multiple choice questions in atomic structure, classification of periodic table, periodic properties, chemical bonding, nuclear chemistry	-
<b>II</b>	Short answer and Multiple choice questions in acids & bases, representative, transition and inner-transition elements, coordination chemistry	-
<b>III</b>	Short answer and Multiple choice questions in carbonyl compounds, alcohols, ethers, organometallic reagents, rearrangements, stereochemistry, name reactions, reaction mechanisms, spectroscopy	
<b>IV</b>	Short answer and Multiple choice questions in solid state, thermodynamics, chemical equilibrium, ionic equilibrium, chemical kinetics, electrochemistry, phase rule, group theory	-
<b>V</b>	Short answer and Multiple choice questions in applied and analytical chemistry	-
<b>References</b>	<p><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. T. S. Rao &amp; T. Sampurna, "Chemistry for Competitive Exams". CBS Publishers &amp; Distributors, New Delhi</li> <li>2. IIT Objective Chemistry-Arul Syamal – Atlantic Publishers &amp; Distributors Pvt</li> </ol>	

	(Ltd) 3. Objective Question Bank in Chemistry – B.K. Sharma 4. Objective Chemistry- K.L.Chugh – Kalyani Publishers, New Delhi. 5. Previous NET, SET, GATE question papers
<b>Course Outcomes (COs)</b>	<b>On completion of the course, students will be able to</b> CO1: justify, reason-out and apply the concepts in General Chemistry CO2: justify, reason-out and apply the concepts in Inorganic Chemistry CO3: justify, reason-out and apply the concepts in Organic Chemistry CO4: justify, reason-out and apply the concepts in Physical Chemistry CO5: justify, reason-out and apply the concepts in Applied and Analytical Chemistry

#### Mapping Course outcome with

Outcomes	PSO					PO								Sum of COs with PSOs & POs	
	1	2	3	4	5	1	2	3	4	5	6	7	8		
CO	1	2	2	2	2	3	2	2	-	-	2	2	2	2	23
	2	2	2	2	3	2	2	2	-	-	2	2	2	2	23
	3	2	2	3	2	2	2	2	-	-	2	2	2	2	23
	4	3	2	2	2	2	2	2	-	-	2	2	2	2	23
	5	2	3	2	2	2	2	2	-	-	2	2	2	2	23
Grand total of COs with PSOs & POs														115	
Mean value of COs with PSOs & POs = 115/55														2.09	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.09
Observation	COs of Chemistry for Competitive Exams strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF CHEMISTRY

NUTRITIONAL BIOCHEMISTRY

Semester : Odd Hours : 30  
Sub. Code : 23VCHO1 Credits :

**Objective:**

**The course aims to make the students to**

- explain the relationship between nutrition and human health. (K2)
- describe the functions, importance of nutrients. (K2, K3)
- analyse the metabolism of nutrients. (K3)
- apply the basic principles of biochemistry to nutrition. (K2, K3)
- analyse the importance of nucleic acids & hormones (K2, K3)

**Unit – 1 Introduction to Nutrition (12 hours)**

Food as source of nutrients, Food classification based on nutritive values function of foods, definition of nutrition, nutrients, adequate, optimum and good nutrition, malnutrition. Inter-relationship between nutrition and health-visible symptoms of good health

**Unit – 2 Energy-giving Nutrients (12 hours)**

***Carbohydrates***

Classification, functions, food sources, digestion, absorption and transport, Mobilization of carbohydrates. Metabolism of carbohydrates, glycolysis – Krebs cycle and storage – Effect of deficiency and excess of carbohydrates

***Lipids***

Classification, functions, food sources – saturated & unsaturated fatty acids digestion, absorption and transport. Mobilization of fat. Effect of excess and deficiency of Lipids

**Unit – 3 Body-building Nutrient (12 hours)**

***Protein***

Classification, functions, food sources, essential amino acids, non essential amino acid digestion, absorption and transport of amino acids, transport, mobilization of protein. Metabolism of proteins. Effects of excess and deficiency of proteins

**Unit – 4 Regulating Nutrients (12 hours)**

***Minerals***

Functions, sources, Bio-availability, and deficiency effects of minerals

### ***Vitamins***

Classification, sources, units of measurement, sources, functions and deficiency effects of vitamins

### ***Water***

As a nutrient, function, sources, requirement, purification. importance of drinking water, characteristic of purified water. Water as a medicine

## **Unit – 5      Nucleic acids & Hormones      (12 hours)**

### **Nucleic acids**

RNA, DNA components, genetic code – protein biosynthesis, DNA and bioengineering

### **Hormones**

Importance of hormones, Hormones in our body Pituitary, adrenal, thyroid, pancreatic and reproductive hormones and their functions

### **Clinical Experiments**

#### **Haematology**

1. Blood grouping
2. Estimation of Haemoglobin: Drabkin's method
3. Estimation of Cholesterol in the blood

#### **Biochemistry**

1. Instrumentation and scan technique: MRI, ECG, X-Ray and Ultrasonic (Demo)

#### **References**

1. Rao, K.R. Textbook of Bio-Chemistry, 3<sup>rd</sup> Edition – Prentice Hall of India Private Ltd., New Delhi (1986)
2. Lehninger, A.L. Principles of Biochemistry, IV Edition – CBS Publishers and Distributors. (2004)

#### **Course Outcomes**

##### **On completion of the course, students will be able to**

- CO1: explain the relationship between nutrition and human health. (K2)
- CO2: describe the functions, importance of nutrients. (K2, K3)
- CO3: analyse the metabolism of nutrients. (K3)
- CO4: apply the basic principles of biochemistry to nutrition. (K2, K3)
- CO5: analyse the importance of nucleic acids & hormones (K2, K3)

### Mapping Course outcome with

Outcomes		PSO					PO								Sum of COs with PSOs & POs
		1	2	3	4	5	1	2	3	4	5	6	7	8	
CO	1	2	2	2	2	2	2	2	2	-	2	2	2	2	24
	2	2	2	1	2	2	2	2	2	-	2	2	2	2	23
	3	2	2	2	2	2	2	2	2	-	2	2	2	2	24
	4	3	3	2	2	2	3	2	2	-	2	2	2	2	27
	5	2	2	2	2	2	2	2	3	-	2	3	3	2	27
Grand total of COs with PSOs & POs														125	
Mean value of COs with PSOs & POs = 125/60														2.08	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.08
Observation	COs of Nutritional Biochemistry strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF CHEMISTRY

CLINICAL NUTRITION AND DIETETICS

Semester	: Even	Hours	: 30
Sub. Code	: 23VCHE1	Credits	:

**Objective:**

**The course aims to make the students to**

- describe and explain energy metabolism and nutritive values of food groups. (K2, K3)
- describe food cooking, food microbiology & hygiene regarding effects of cooking and food microbiology. (K2, K3)
- state and explain the nutrient requirement at different ages. (K2, K3)
- Predict the modifications in nutrient and dietary requirements for various diseases. (K2, K3)
- acquire ability to plan and prepare diets for various diseases. (K2, K3)

**Unit – 1 Energy Metabolism & Nutritive Values of Food Groups (12 hours)**

Basal energy, Basal metabolic rate (BMR), factors influencing BMR – Energy requirement of different ages – Nutritive value of food groups, cereals and millets, pulses, nuts and oil seeds, fat and oils, sugar, milk and milk products, egg and animal foods, vegetables, fruits, spices, condiments, beverages, novel proteins. Recommended dietary allowances, planning of balance diet

**Unit – 2 Food Cooking, Food Microbiology & Hygiene (12 hours)**

Selection of foods, preliminary treatment of foods, method of cooking, changes occurring in nutrients during cooking, effect of cooking on different foods groups

Microorganism in foods, beneficial effect of microorganism, ill effects of microorganism, micro organism and hygiene – Common adulterants in different foods

**Unit – 3 Nutrition & Dietetics (12 hours)**

Nutritional requirements of infancy, pre-school children, adolescence, adults and old age

Role of dietitian – The hospital and community – Basic concepts – Diet therapy. Therapeutic adaptation – The normal diet. Routine hospital diets – Regular diet, light diet, soft diet, full liquid diet and tube feedings

**Unit – 4 Obesity and Leanness (12 hours)**

Diet in Allergy and skin disturbances

Classification, manifestations, common food allergies, tests and dietetic treatment – Feeding infants and children – problems in feeding children in the hospital.

**Unit – 5      Diet in disturbances and diseases****(12 hours)**

Diarrhoea (child and adult), Constipation, flatulence, Gastritis, ulcers, Diet in Influenza, Typhoid fever, Jaundice, Recurrent Malaria and Tuberculosis

**Practical Experiments****Clinical Nutrition**

1. Assessment of nutritional status by measuring height and weight – BMI
2. Preparation of meal plan – Normal Person and sport person
3. Preparing a meal plan for a diabetic person

**Biochemistry**

1. Estimation of blood sugar-glucose by ortho-Toluidine method
2. Estimation of blood urea by DAM-TSC method

**References**

1. Anita F.P. Clinical Dietetics and Nutrition 3<sup>rd</sup> edition. Oxford University Press, Bombay (1989).
2. Passmore P. and M.A. Eastwood. Human Nutrition and Dietics, 8<sup>th</sup> Ed. ELPS, Churchill, Livingstone (1986).
3. Anderson. L., M.C. Dibble, P.R. Turki, H.S Mitchell and H.J. Rynbergen: Nutrition in Health and Disease, 17<sup>th</sup> Ed. J.B. Lippincott Co., Philadelphis (1982).
4. Bennion M., Clinical Nutrition, Harper and Row Pub., N.Y. (1979).
5. Francis, D.E.M. Diets for sick children, Blackwell Scientific Publications (1987).

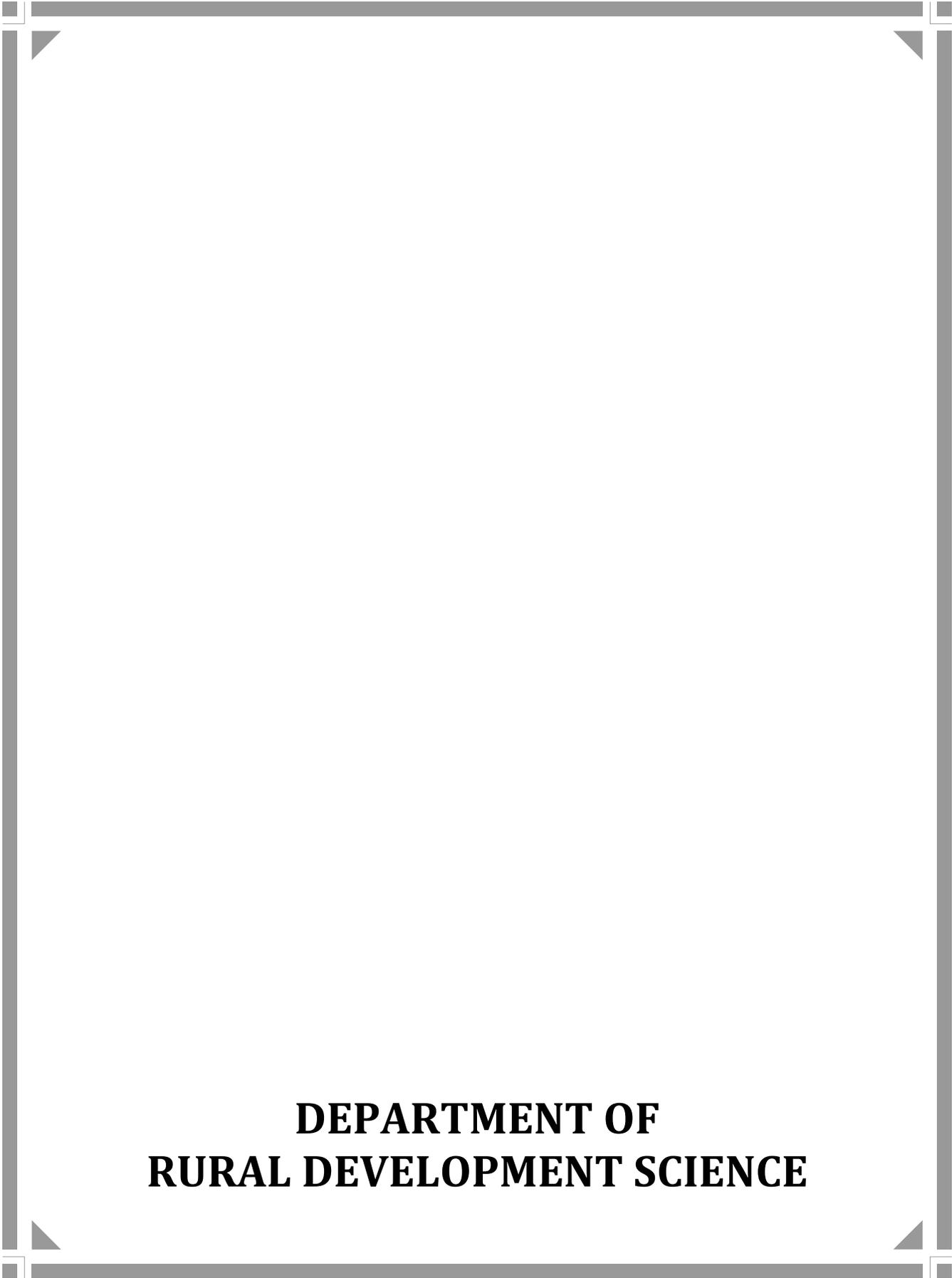
**Course Outcomes****On completion of the course, students will be able to**

- CO1: explain the relationship between nutrition and human health. (K2)  
CO2: describe the functions, importance of nutrients. (K2, K3)  
CO3: analyse the metabolism of nutrients. (K3)  
CO4: apply the basic principles of biochemistry to nutrition. (K2, K3)  
CO5: analyse the importance of nucleic acids & hormones (K2, K3)

### Mapping Course outcome with

Outcomes		PSO					PO								Sum of COs with PSOs & POs
		1	2	3	4	5	1	2	3	4	5	6	7	8	
CO	1	2	2	2	2	2	2	2	2	-	2	2	2	2	24
	2	3	2	1	2	2	2	2	2	-	2	2	3	2	25
	3	2	2	2	3	2	2	2	2	-	3	2	2	2	26
	4	3	3	2	2	2	3	2	2	-	2	2	2	2	27
	5	2	2	2	2	2	2	2	2	-	2	3	2	2	25
Grand total of COs with PSOs & POs														127	
Mean value of COs with PSOs & POs = 127/60														2.12	

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
Mean value of COs with POs & PSOs			2.12
Observation	COs of Clinical Nutrition and Dietetics strongly related with PSOs and POs		



**DEPARTMENT OF  
RURAL DEVELOPMENT SCIENCE**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**CBCS Pattern (From 2022-23 onwards)**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

<b>SEMESTER I</b>				
<b>Part</b>	<b>Sub. Code</b>	<b>Title of the Paper</b>	<b>Hours</b>	<b>Credits</b>
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil/Hindi/French	6	4
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream - B	5	4
III	22URDC11	Core-1 Fundamentals of Life Sciences	5	4
	22URDC21	Core-2 Basics of Farm Animal Management	5	4
	22URDP11	IRD Practical	2	2
	22URDA11	Allied-1 Introduction to Rural Society	5	4
IV	22UFCE11	FC – Personality Development	1	1
	22UCSH12	Communication Skill	1	-
	22UBRC11	Bridge Course	-	1
V	22UNCC/NSS/ PHY.EDU./ YRC/ ROT/ACF/NCB12	Extension Activities NCC/NSS/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	-	-
<b>Total</b>			<b>30</b>	<b>24</b>
<b>SEMESTER II</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil / Hindi /French	6	4
II	22UENA22/ 22UENB22	English through Prose & Short Story – Stream A English through Prose & Short Story – Stream B	5	4
III	22URDC32	Core-3 Dynamics of Rural Development	5	4
	22URDC42	Core-4 Introduction to Agriculture	5	3
	22URDP22	IRD Practical	2	2
	22URDA22	Allied-2 Energy Science	5	4
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skill	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NCC/NSS/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	-	1
<b>Total</b>			<b>30</b>	<b>24</b>
<b>SEMESTER III</b>				
III	22URCA53/ 22URCH53/ 22URCS53	Core-5 Agronomy of Field Crops/ Dairy Husbandry/ Participatory Rural Appraisal	4	3
	22URCA63/ 22URCH63/ 22URCS63	Core-6 Agronomy of Horticultural Crops/ Milk and Milk Products/Gender, Society and Development	4	3
	22URCA73/ 22URCH73/ 22URCS73	Core-7 Agricultural Entomology / Farm Management Practice-I /Human Behaviour in Rural Society	4	3

	22URAP33/ 22URHP33/ 22URSP33	IRD Practical	5	4
IV	22URDA33	Allied-3 Community Based Disaster Management	6	4
	22URDN13	NME-1 Contemporary Social Problems in India (for Science students)	3	2
	22USBZ13	SBE-1- Fundamentals of Computer, Internet and Office Automation	1	1
	22USBY13	SBE-1- Fundamentals of Computer, Internet and Office Automation – Practical	2	1
	22UFCE34	Environmental Studies	1	1
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC / NSS / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
	22UARE14	ARISE	-	-
		<b>Total</b>	<b>30</b>	<b>22</b>
<b>SEMESTER IV</b>				
III	22URCA84/ 22URCH84/ 22URCS84	Core-8 Plant Pathology/ Poultry Husbandry/ Rural Economics	4	3
	22URCA94/ 22URCH94/ 22URCS94	Core-9 Organic Farming/ Pig Farming / Science and Technology for Rural Development	4	3
	22URCA04/ 22URCH04/ 22URCS04	Core-10 Agricultural Bio-Technology / Farm Management Practice-II / Youth Empowerment and Policies	4	3
	22URAP44/ 22URHP44/ 22URSP44	IRD Practical	5	4
	22URDA44	Allied-4 Communication and Extension	6	4
IV	22URDN24	NME-2 Food Preservation	3	2
	22USBZ34	SBE-1- Web Design	1	1
	22USBP34	SBE-1- Web Design – Practical	2	1
	22UFCH44	FC-Religious Literacy and Peace Ethics	1	1
V	22UNSS/NCC/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
	22UARE14	ARISE	-	1
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>SEMESTER V</b>				
III	22URDD15	Core-11 Social Welfare Administration	6	5
	22URDD25	Core-12 Community Based Organisation	4	3
	22URDD35	Core-13 Rural Social Problems	4	3
	22URDD45	Core-14 Social Research Methodology	<b>6</b>	<b>5</b>
	22URDP55	IRD Practical	<b>5</b>	<b>5</b>
	22URDE15	Core Elective-1 Commercial Agriculture	3	3

IV	22USS16	Soft Skills	2	
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>SEMESTER VI</b>				
III	22URDD56	Core-15 Development of the Marginalised	6	5
	22URDD66	Core-16 Corporate Social Responsibility for Rural Development	5	4
	22URDD76	Core-17 Rural Community Health	4	3
	22URDD86	Core-18 Rural Industries and Management	<b>5</b>	<b>4</b>
	22URDP66	IRD Practical – 15 day internship programme	<b>5</b>	<b>5</b>
	22URDE26	Core Elective-2 Animal Products Marketing	3	3
IV	22USS16	Soft Skills	2	2
		<b>Total</b>	<b>30</b>	<b>26</b>

SEMESTER	I	II	III	IV	V	VI	TOTAL
CREDITS	24	24	22	24	25	25	144

Part – I		08
Part – II		08
Part – III		
	Core	87
	Allied	16
	Core Electives	06
	Total	108
Part – IV		
	Non-Major Electives	04
	Skill based Electives	04
	Value Education	04
	Total	12
Part – V		02
	Bridge Course	01
	Arise	01
	Communication Skill	01
	Soft Skill	02

<b>SELF LEARNING COURSES</b>			
Semester	Sub. Code	Paper	Credit
III	22URDSL3	Human Rights	3
IV	22URDSL4	Aquaculture	3
V	22URDSL5	Mushroom Production	3
VI	22URDSL6	Milk Products	3

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**Programme Specific Outcome of the Department of Rural Development  
Science**

- PSO1: To understand the nature and basic concepts of Biological Sciences, Agriculture, Animal Husbandry and Social Sciences.
- PSO2: To integrate various aspects of Biological Sciences, Agriculture, Animal Husbandry and Social Sciences.
- PSO3: To develop the specific skills of Biological Sciences, Agriculture, Animal Husbandry and Social Sciences through practical, field exposure and training.
- PSO4: To analyse the usefulness of these subjects in becoming “Rural Development Personnel” and Entrepreneur.
- PSO5: To apply the knowledge and skills acquired in Biological Sciences, Agriculture, Animal Husbandry and Social Sciences in training the farmers.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

<b>Class</b>	<b>: III B.Sc. RDS</b>	<b>Part</b>	<b>: Core 11</b>
<b>Semester</b>	<b>: V</b>	<b>Hours</b>	<b>: 90</b>
<b>Sub. Code</b>	<b>: 22URDD15</b>	<b>Credit</b>	<b>: 5</b>

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**SOCIAL WELFARE ADMINISTRATION**

**(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)**

**Course Education Objectives**

1. To impart knowledge about social welfare Administration
2. To provide necessary knowledge about registration and administration of various Welfare organizations.
3. To be acquainted with roles and functions of welfare boards at Central and State level.
4. To understand the basic concept of Social Policy and its formulation
5. To develop skills related to administrative process.

**UNIT –I: Social Welfare Administration (18 Hours)**

Introduction; Meaning –Definition- Nature and Scope. Models of Social Welfare Administration; Familial model, Residual model, Mixed economy model, Model of State control -Principles and Functions of Social Welfare Administration.

**UNIT– II: Administrative process in Welfare Institutions (18 Hours)**

Programme Management -Financial and Office Administration; Budgeting, Accounting, Auditing, Fundraising strategies, Record maintenance, Documentation, Public relations.

**UNIT –III: Registration of Welfare Organization (18 Hours)**

NGO: Concept-importance of Welfare Organizations in National Building-Types-Registration of NGOs: Societies Registration Act-1860- Indian Trust Act-1882- Section25-Compay Act 1956 - The Cooperative Societies Act 1904 and its features, provisions and procedures— Tax Provisions and Legal Compliance of FCRA-2020 - Problems and issues faced by NGOs

**UNIT- IV: Social Welfare Boards (18 Hours)**

Central Social Welfare Board- State Social Welfare Advisory Board-Origin- Objectives - Functions - Programmes and Schemes of the State and Central Social Welfare Boards

**UNIT- V: Social Policy (18 Hours)**

Concept-Meaning-Definitions- Scope –Nature – Process- formulation of Social Policy- National Social policy for Children- Youth-Women - Senior Citizens - Differently abled.

**Books for Study**

William, A Thomas., (2023), Social Welfare Administration, Authors Press, New Delhi.  
William, A Thomas., (2023), Social Policy, Authors Press, New Delhi.  
Bhattacharya, Sanjay., (2006), Social Work Administration, Rawat Publication, Jaipur.  
Chowdry, Paul D.,(1990), Social Welfare Administration, Atma Ram and Sons, New Delhi.  
Dhama, O.P.,(1986), Extension and Rural Welfare, Ram Prasad & Sons, Agra.

**Books for reference**

Dubey, S.N.,(1972), Social Welfare Policy and Social Welfare Service, Tata Institute of Social Sciences, Bombay.  
Goel, S. L.,(2010), Social Welfare Administration: Social Justice and Empowerment. Vol.1& 2, Deep and Deep Publication Pvt. Ltd., New Delhi.  
Johri, P.K.,(2007), Social Administration, Anmol Publication, New Delhi.

Mazumdar, Ammu Menon., 1964, Social Welfare in India, Asian Publishing House, Bombay.  
 Ranjana, Devi.,(2009), Social Welfare: Concepts and Theory, Omega Publications, New Delhi.  
 Sachedeva, D.R., (2009), Social Welfare Administration, Kitab Mahal, New Delhi.  
 Skidmore, R.A., (1995), Social Work Administration, Allyn & Bocan, Boston .

### Teaching and Learning Methods

1. Class Lecture
2. Assignment
3. Seminars
4. Use of ICT
5. Group Discussion
6. Case Study
7. Exposure Visit
8. Field Work
9. Internship Training

### Course outcome

CO	Course Outcome	levels
1	Identify the various social welfare institutions and models of social welfares	K2
2	Plan and organize various social welfare programmes	K3
3	Formulate social welfare projects	K3
4	Train and provide technical support to social welfare organizations	K3
5	Start social welfare institutions to work subalterns	K4

### Mapping of Course outcomes with POs and PSOs

(Programme Outcomes – POs, Programme Specific Outcomes – PSOs)

	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
<b>CO1</b>	3	2							3	2				10
<b>CO2</b>	2	2	3	3					2	2	2	1	2	19
<b>CO3</b>	2	2	2	3	1	1			2	1	2	2	2	20
<b>CO4</b>	2	1	2	2	1				2	2	1	2	2	17
<b>CO5</b>	2	2	3	2	1				1	1	2	2	2	17
Grand Total of COs with POs & PSOs														83
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{83}{44}$														1.888

S – Strong; M – Medium; L – Low

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs		<b>1.88</b>	
Observation	<b>COs of SOCIAL WELFARE ADMINISTRATION are moderately correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

Class	: III B.Sc. RDS	Part	: III Core -12
Semester	: V	Hours	: 60
Sub. Code	: 22URDD25	Credit	: 3

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**COMMUNITY BASED ORGANISATION**

(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)

**Course Outcomes**

At the end of the course, the students will be able to:

- CO1: Apply community organization principles, concepts and techniques in the civil society organization and in the community development
- CO2: Matching various approaches and models in their local settings
- CO3: Competency to advise and train the Self-help Groups to promote the rural development activity
- CO4: Interrelated role of social media, banking and political institution
- CO5: Students are motivated to set up an NGOs in future

**Unit – I: Community Based Organization (12 Hours)**

Meaning, Definition, Concept, classification – Broad framework of the state and civil society- Concept, role and functions of civil Society organization – Principles of Community organization.

**Unit-II Approaches for Rural development (12 Hours)**

CBO Approach to Rural Development - Basic Characteristics of CBOs - CBOs and Rural Development – CBO Approach and various committees - Sustainable Rural Development.and Aga Khan Rural Support Programme (AKRSP)

**Unit – III: Self Help Groups (12 Hours)**

Objectives, Characteristics, Origin and growth of SHGs – Stages: Preformation, Formation, Stabilization, Expansion and Diversification – Achievements and Problems of SHGs – SHGs - Government Organizations- Farmers Producers Company

**Unit – IV: Various Agencies for Rural Development (12 Hours)**

Farmers club, youth club, Women’s Forum – Role of Social Media - Micro credit institutions, Co-operatives, rural banking – Political institutions.

**Unit – V: NGO Management (12 Hours)**

NGO – Meaning, concept, categories of NGOs, - formulation and Registration of NGO – Constitution, byelaws. Memorandum – *FCRI*

**Teaching Learning Methods**

- ICT usage
- Creative assignments
- Individual cum Group Presentation
- Newspaper Reading and Analysis
- Peer Learning
- Field Exposure and Training
- Group Discussion

- Group Projects
- Short films and other educational videos

### Books for Study

N. Lalitha, (2004). RURAL DEVELOPMENT IN INDIA, Dominant Publishers and Distributors, 116A, South Anarkali, Delhi 110 051, India

Kumar, R.and Goel, S.L.(2005).Administration and Management of NGOs: Text and Case studies. New Delhi: Deep & Deep Pub.

Frances, S. (2009).Microfinance Self Help Groups in India: Living Up to Their Promise.New Delhi: Practical Action Publishing.

### Books for reference

Das, P. (2016). Self Help Groups: Problems opportunities and challenges ahead, New Delhi biotech books.

Patil, A. R. (2012). Community Organization and Development: An Indian Perspective. New Delhi: PHI Learning Pvt. Ltd.

Dharmaraj, S. (2006). Panchayat Raj Systems in India. New Delhi:Abhijeet Publications.

Prasad, B.K. (2004). NGO's and Development, New Delhi: Anmol Publication.

Chambers, Robert,( 2002). Operationalising Participatory Approaches in Natural ResourceManagement, Report of-the Workshop on ABC Workshop, Ahmedabad: Development Support Centre, Ahmedabad.

Mohanty, Ranjita, (2002). Are Project Created Institutions Sustainable, Seminar 514, June.

Shah, (1993). Voluntarism – Concept and Issue, New Delhi: Vikas Publishing Co.Desai,

### Course Outcomes (COs)

S. No.	Course Outcome At the end of the course, the students will	Knowledge Level (Bloom's Taxonomy)
CO1	Apply community organization principles, concepts and techniques in the civil society organization and in the community development	K2
CO2	Matching various approaches and models in their local settings	K4
CO3	Competency to advise and train the Self-help Groups to promote the rural development activity	K3
CO4	Interrelated role of social media, banking and political institution	K3
CO5	Students are motivated to set up an NGOs in future	K2

**K1= Knowledge, K2= Understanding, K3= Application, K4= Analysis and K5= Synthesis**

### Mapping of Course outcomes with POs and PSOs

(Programme Outcomes – POs, Programme Specific Outcomes – PSOs)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
<b>CO1</b>	3	2							3	1				9
<b>CO2</b>	2	2	2	3					2	2	1	1	2	17
<b>CO3</b>	2	2	2	2	1	1			2	1	1	2	2	18
<b>CO4</b>	2	1	2	2	1				2	2	1	2	2	17
<b>CO5</b>	2	1	3	2	1				1	1	2	2	2	16
Grand Total of COs with POs & PSOs														77
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{77}{45}$														1.71

**S – Strong; M – Medium; L – Low**

Mapping Scale	1	2	3
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>		<b>1.71</b>	
<b>Observation</b>	<b>COs of RURAL SOCIAL PROBLEMS are moderately correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

<b>Class</b>	<b>: III B.Sc. RDS</b>	<b>Part</b>	<b>: III Core -13</b>
<b>Semester</b>	<b>: V</b>	<b>Hours</b>	<b>: 60</b>
<b>Sub. Code</b>	<b>: 22URDD35</b>	<b>Credit</b>	<b>: 3</b>

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**RURAL SOCIAL PROBLEMS**

**(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)**

**Course Educational Objectives:**

1. To bring out the interrelationship between society and social problems
2. To provide the multifaceted aspects of rural poverty
3. To impart a comprehensive knowledge on rural unemployment and population explosion
4. To discuss the problems and challenges of youth
5. To explain the social problems faced by rural women and children, and elderly

**Unit – I: Social Problems: Meaning and Concept** **12 Hours**

Meaning - definitions – concepts - characteristics - causes and types of social problems.

**UNIT - II: Rural Poverty** **12 Hours**

Rural Poverty - concept, incidence, magnitude, causes, effective strategies for alleviating poverty

**UNIT - III: Rural Unemployment, Population Explosion** **12 Hours**

Rural Unemployment - magnitude, features, types, causes and consequences, measures to control unemployment - rural unemployment and remedies.

Population explosion - magnitude, causes, effects of population explosion - population policy, measures to control population explosion.

**UNIT- IV: Problems of Youth** **12 Hours**

Juvenile delinquency - drug abuse and drug addiction – AIDS - youth unrest and agitations - suicide, mobile addiction - cybercrime.

**UNIT - V: Problems of Rural Women and Children** **12 Hours**

Problems of women: dowry, women harassments, domestic violence, female infanticide, honour killing and surrogacy - problems of children: child abuse, child labour - trafficking in women and children - legal protections of women and children - problems of elderly persons – measures to protect the aged.

**Book for Study**

Ahuja, Ram, (2020), 'Social Problems in India', Rawat Publications, Jaipur.

**Books for Reference**

Husnain, Nadeem, (2020), 'Indian Society: Themes and Social Issues', McGraw Hill Education (India) Pvt. Ltd., Chennai.

Rao, Shankar C.N., (2015), 'Indian Social Problems: A Sociological Perspective', S. Chand Publishing, New Delhi.

Singh, Awadhesh Kumar and Jayanta Choudhury, (2012), 'Violence against Women and Children: Issues and Concerns', Serials Publications, New Delhi.

Durkheim, Emile, (2002), 'Suicide: A Study in Sociology', Routledge, London.

### Teaching Learning Methods

- Field Exposure and Training
- Group Discussion
- Group Projects
- Individual cum Group Presentation
- Newspaper Reading and Analysis
- Peer Learning
- PowerPoint Presentation
- Short films and other educational videos

### Course Outcomes (COs)

S. No.	Course Outcome At the end of the course, the students will	Knowledge Level (Bloom's Taxonomy)
CO1	Identify the social, economic, political and cultural causes of social problems	K2
CO2	Formulate suitable intervention strategies to alleviate rural poverty	K4
CO3	Organize programmes on population control and propose income generating activities for rural farmers	K3
CO4	Counsel the youth affected by social issues	K3
CO5	Suggest legal and other measures to safeguard women and child rights	K2

K1= Knowledge, K2= Understanding, K3= Application, K4= Analysis and K5= Synthesis

### Mapping of Course outcomes with POs and PSOs

(Programme Outcomes – POs, Programme Specific Outcomes – PSOs)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	2							3	1				9
CO2	2	2	2	3					2	2	1	1	2	17
CO3	2	2	2	2	1	1			2	1	1	2	2	18
CO4	2	1	2	2	1				2	2	1	2	2	17
CO5	2	1	3	2	1				1	1	2	2	2	16
Grand Total of COs with POs & PSOs														77
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} =$														1.71
$\frac{77}{45}$														

S – Strong; M – Medium; L – Low

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs		1.71	
Observation	COs of RURAL SOCIAL PROBLEMS are moderately correlated with POs & PSOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

<b>Class</b>	<b>: III B.Sc. RDS</b>	<b>Part</b>	<b>: Core -14</b>
<b>Semester</b>	<b>: V</b>	<b>Hours</b>	<b>: 90</b>
<b>Sub. Code</b>	<b>: 22URDD45</b>	<b>Credit</b>	<b>: 5</b>

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**SOCIAL RESEARCH METHODOLOGY**

**(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)**

Course Educational Objectives (CEO)

The student will/would

1. be able to acquaint and understand the importance of social science research and the different types of research employed in the context of rural development.
2. be able to formulate a proper research problem specifically that can be applied in the field of rural development.
3. be able to understand the various methods of research and research designs that are applied in research.
4. have acquainted himself/herself with different sampling methods and Tools of data collection that are precisely used in research.
5. be equipped with practical knowledge of data analysis and report writing in the context of social research.

**Unit 1: (18 hours)**

Introduction: Research-Definition-Objectives- Scope-motivations for research-limitations, Types: Pure-Applied-Action Research, - Quantitative and Qualitative Research, Mixed Methods, Interdisciplinary Research- Application of Social Science Research in Rural Development.

**Unit 2: (18 hours)**

Research Process: Steps in the research process: Formulating the research problem-Literature Review-Objectives-research design-collection of data-Processing and analyzing the data- Reporting and presenting the Findings. Criteria of good research

**Unit 3: (18 hours)**

Research Design and Methods of Social Research: Research Design: Meaning- Types-Exploratory- Descriptive-Diagnostic and Experimental. Methods of Social Research: -Survey Method- Case Study Method-PRA Method. Types of Data: Primary -Secondary Data.

**Unit 4: (18 hours)**

Sampling and Data Collection: Sampling: Definition-Types-Probability Sampling; Simple Random Sampling-Complex Random Sampling- Cluster Sampling- Multistage Sampling, Non-Probability Sampling; Convenience/Purposive Sampling-Judgemental Sampling-Quota Sampling- Snowball sampling. Tools of Data Collection; Interview-Questionnaire-Interview Schedule-Observation-Focussed Group Discussion.

**Unit 5: (18 hours)**

Data Analysis and Report Writing: Classification- Tabulation-Interpretation and Presentation of Data. Measures of Central Tendency; Mean-Median-Mode. Format of a Research Report. Qualities of a good research report –Ethics in Research-Plagiarism.

### Teaching -Learning Methods

- Blended Learning                      Work Shops and Hands-On Training
- Lecture Method                         Group Discussions
- PPT Presentations                      Mini Project
- E-Content(Videos)                      Guest Lectures

### Books for Study

Thomas William, A (2021), Research Methods: Quantitative, Qualitative and Mixed Methods, Authors Press, New Delhi.

### Reference

Kothari C. R, and Gaurav Garg (2023), Research Methodology, Methods and Techniques, New Delhi, New Age Publishers.

Sundarapandian, P, S.Muthulakshmi, T. Vijaykumar (2022), Research Methodology and Application of SPSS in Social Science Research, New Delhi, Sultan Chand and Sons.

Kumar, Ranjith (2011), Research Methodology-A step by Step guide for beginners, New Delhi, Pearson.

Kothari C.R and Gaurav Garg (2014), Research Methodology-Methods and Techniques, New Delhi, New Age International Publishers

Research Methodology (2019), Mohamed, Peer S (2019), Madurai, Pass Publications.

### E References

<https://www.simplilearn.com/what-is-data-collection-article>

<https://www.iedunote.com/research-process>

### Course Outcomes

After completing the course the students will be

Course Outcome No	Course Outcome	Level
1	Gain basic knowledge about social science research, understand and realize the importance of interdisciplinary research in the context of RD	K3
2	Will be able to formulate a research problem	K3
3	Identify the appropriate research design to be applied contextually.	K3
4	Recognize the significant tools in data collection and apply the same	K3
5	Understand and create a research project choosing the appropriate style and using basic statistical tools.	K4

### Mapping of Course Outcomes and POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of CO+PSO+PO
CO1	3	2							3	2				10
CO2	3	3							3	2				11
CO3		3			2					3	2			10
CO4						3						3	2	8
CO5	3	3			2	2			3	3	2	2		20
Grand Total of Cos with POs and PSOs														50
Mean Value of Cos with POs and PSOs=Grand Total of Cos with POs and PSOs/Number of Cos relating with POs & PSOs.														50/24=2.08

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2-1.3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.08
Observation	COs of Social Research Methodology is strongly correlated with POs and PSOs		



Students will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Acquaint with the structure of non- government organization	K2
CO 2	Interrelate role of, NGO, panchayat raj, social media, banking and political institution	K3
CO 3	Competency to advise and train the Self-help Groups to promote the rural development activity	K3
CO 4	Counsel the youth affected by social issues	K3
CO 5	Students are motivated to set up an NGOs in future	K3

K1 = Knowledge, K2 = Understanding, K3= Application, K4= Analysis and K5

### Mapping of the course outcome with POs and PSOs

(Programme Outcome- Pos, Programme Specific Outcome- PSOs)

Course Out come	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of CO's with PSO's & POs
CO1	2	3	2		2	2			3	2	2	2		20
CO2	3	2	3		2	2			2	2	3	2		21
CO3	3	2	2		2	2			2	3	2	2		20
CO4	2	1	3	2	3	3	2	2	2	2	3	3	1	29
CO5	2	1	2	3	2	2	3	3		2	2	2	3	27
Grand Total of COs with PSO and POs														117
Grand total of COs with PSOs and POs														2.25
Mean Value of COs with PSO and POs												117		
Number of COs relating with PSOs and Pos												52		

Strong – 3 Medium – 2 Low - 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSO and POs			2.25
Observation	COs of Integrated Rural Development - Practical Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

Class	: III B.Sc. RDS	Part	: III Core Elective -1
Semester	: V	Hours	: 45
Sub. Code	: 22URDE15	Credit	: 3

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**COMMERCIAL AGRICULTURE**

(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)

Course Educational Objectives:

1. To impart knowledge on the cultivation of silkworms.
2. To empower students on the technical features of honeybees.
3. To inculcate the agronomical aspects of mushroom
4. To elucidate the composting methods using earthworms.
5. To understand the holistic development of Indian Knowledge System in Agriculture.

**Unit I Sericulture**

**(9 Hours)**

Sericulture –silkworm types and races – Mulberry cultivation – varieties and cultivation – Pests, and diseases of mulberry and their management. Rearing house – types – Chawki rearing – feeding, cleaning, spacing and moulting care in different stages – harvesting – Pests and diseases of silkworm and their management. – Yield- Economics of sericulture

**Unit II Apiculture**

**(9 Hours)**

Apiculture - Bee species – comparison- castes of bees, bee behaviour and bee dance; Apiary management practices – bee pasturage, foraging, seasonal variations; Bee products – properties and uses. Effect of agricultural inputs on bee activity – Yield – Economics of bee keeping

**Unit III Mushroom cultivation**

**(9 Hours)**

Mushrooms- Types- Oyster, Button and Milky mushrooms- Methods of cultivation- Prerequisites of mushroom shed- Physical conditions- Infrastructure needed. Marketing of mushrooms- Nutritive value –Yield- Economics of mushroom cultivation

**Unit IV Vermicomposting**

**(9 Hours)**

Vermicomposting- Earthworm- Life cycle- Types- Methods of vermicomposting- Soil- Tanks- Pits- Sheds- Substrate- Requirements for composting- Management of composting period- Yield- Economics of vermicomposting

**Unit V Indian Knowledge System in Agriculture**

**(9 Hours)**

Agriculture in India: krishisuktas, Krishiparashara, Brihatsamhita, Types of crops, Manures, Types of land- devamatraka, nadimatraka, Traditional agricultural practices, Traditional water-harvesting practices, Traditional Forecasting.

**Teaching Learning Methods**

- ICT, Seminar
- Field visit
- Assignments
- Demonstration etc.,

**Book for study**

Divya, M.P., K.T.Parthiban, K.Srinivasan, K.Vanangamudi and M.Govinda Rao. (2008). A text book on Social Forestry and Agroforestry. Satish Publishers, Delhi

**Books for Reference :**

- David, B.V. and V.V. Ramamurthy. (2011). *Elements of Economic Entomology*, Namrutha Publications, Chennai, 386 p.
- CSB. (2003). *Seri Business Manual- Vol. III Farm & Industry Sectors*, Central Silk Board, Bangalore.
- Dandin, S.B., J.Jayaswal and K. Giridhar.(2003). *Hand book of Sericulture Technologies*. Central Silk Board, Bangalore, 287 p.
- Dwivedi, A.P. (1992). *Agroforestry Principles and Practices*. Oxford & IBH publishing Co., New Delhi
- R N Basu, T K Bose, CS, Cakraborty (2014) *History of Science in India - Agricultural Science (Volume V)* the national academy of science, India & the ramkrishna mission institute of culture.

**Web resources**

- <http://www.sristi.org/hbnew>
- <http://www.ncipm.org.in/recent-publications.htm> <http://www.ipmnet.org>

**Course Outcome**

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Knowledge of Raising allied enterprises of agriculture namely sericulture	K1
CO 2	Knowledge on rearing honey bees	K1
CO 3	Awareness on the Methods of cultivation of Mushroom	K2
CO 4	Skills of Different methods of Vermicomposting.	K3
CO 5	To help to understand the apparently rational, verifiable and universal solution from ancient Indian knowledge system for the scientific, technological and holistic development of Indian Knowledge System in Agriculture.	K3

### Mapping of the course outcome with POs and PSOs

(Programme Outcome- Pos, Programme Specific Outcome- PSOs)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
<b>CO1</b>	2	2	2	1	1				2	2	2			14
<b>CO2</b>	2	1	2	2	2				2	2	1			14
<b>CO3</b>	2	1	2	2	1				2	1	1			12
<b>CO4</b>	1	2	1	1	1				1	2	2			11
<b>CO5</b>	2	2	2	1	1				2	2	1			13
<b>Grand Total of Cos with POs &amp; PSOs</b>														64
$\text{Mean Value of COs with POs \& PSOs} = \frac{\text{Grand Total of Cos with POs \& PSOs } 64}{\text{Number of Cos relating with POs \& PSOs } 40} = 1.6$														1.6

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>		<b>1.60</b>	
<b>Observation</b>	<b>COs of COMMERCIAL AGRICULTURE are moderately correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

<b>Class</b>	: III B.Sc. RDS	<b>Part</b>	: Self Learning
<b>Semester</b>	: V	<b>Hours</b>	:
<b>Sub. Code</b>	: 22URDSL5	<b>Credit</b>	: 3

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**MUSHROOM PRODUCTION**

(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)

1. To introduce the taxonomy of mushroom
2. To elucidate the housing technologies of mushroom.
3. To impart the knowledge of different methods of mushroom cultivation.
4. To acquaint the students about commercial mushroom cultivation
5. To empower the students on value addition in mushroom.

**UNIT I:**

**Mushroom** – Definition – Importance – History of Mushroom in India – Morphology – life cycle of mushroom – Types and Varieties of Mushroom.

**UNIT II :**

**Housing:** Meaning – Systems of housing – Housing material. Compost and methods of composting.

**UNIT III:**

**Crop Management:** temperature – Humidity – Ventilation – Watering – Spawn running – Casing to Mushroom Period – Cropping Period – Picking, Yield storage and preservation methods.

**UNIT IV :**

**Upscaling Mushroom Cultivation** – Mushroom cultivation – Commercial scale- Industrial units- Machinery- Production- Purification- Packaging- Branding – Labelling- Digital marketing

**UNIT V:**

**Values Of Mushroom**– Food Value – Proteins – Vitamins – Minerals – Carbohydrates and fats – Energy Values of Mushroom – Medical Values of Mushroom and other Important Uses – Delicious recipes of Mushroom - Value added products - marketing.

**Books for Reference**

Brig. Hramander Singh, (1991), Mushrooms: The Art of Cultivation, II Edition, New Delhi : Sterling Publishers Private Limited.

Chandy, K.T., (1996), Mushrooms: Cultivation Practices, New Delhi: Indian Social Institute  
Chandy, K.T., (1996), Mushrooms: Housing and Composting, New Delhi: Indian Social Institute.

Chandy, K.T., (1996), Mushrooms: in Human Life, New Delhi: Indian Social Institute.

Chandy, K.T., (1996), Problems in Mushrooms Cultivation, New Delhi: Indian Social Institute

Chandy, K.T., (1997), White Button Mushrooms, New Delhi: Indian Social Institute. Nita Bahl (1994), HandBook of Mushrooms, III Edition, New Delhi Oxford and IBH Publishing Co. Pvt. Ltd.,

TNAU (1999), Crop Production Guide, Directorate of Agriculture, Chennai.

## Web resources

<http://www.sristi.org/hbnew>

[http://www.ncipm.org.in/recent-](http://www.ncipm.org.in/recent-publications.htm)

[publications.htm http://www.ipmnet.org](http://www.ipmnet.org)

## Course Outcomes

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Capability to differentiate edible and non-edible mushrooms	K2
CO 2	Technical knowledge on housing methodologies of mushroom	K1
CO 3	Agronomical skill of different types of mushrooms.	K3
CO 4	Proficiency on mushroom pest and disease management.	K3
CO 5	Nutritional skills on value addition of mushroom.	K3

## Analysis and K5

### Mapping of Course outcomes with POs and PSOs

(Programme Outcome – POs, Programme Specific Outcome – PSOs)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	2	2	2	1	1				2	2	2			14
CO2	2	1	2	2	2				2	2	1			14
CO3	2	1	2	2	1				2	1	1			12
CO4	1	2	1	1	1				1	2	2			11
CO5	2	2	2	1	1				2	2	1			13
Grand Total of COs with POs & PSOs														64
Mean Value of COs with POs & PSOs =													64	1.6
													=	
													<i>Number of Cos relating with POs &amp; PSOs</i>	40

S– Strong; M – Medium; L – Low

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs		1.60	
Observation	COs of MUSHROOM PRODUCTION are moderately correlated with POs & PSOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

<b>Class</b>	<b>: III B.Sc. RDS</b>	<b>Part</b>	<b>: III Core-15</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>: 90</b>
<b>Sub. Code</b>	<b>: 22URDD56</b>	<b>Credit</b>	<b>: 5</b>

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**DEVELOPMENT OF THE MARGINALISED**

**(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)**

**Objectives**

1. To gain knowledge about the various subaltern groups and their problem in the society
2. To understand the socio-economic status of SC/STs, Women and Children in India
3. To create a perspectives on the different subaltern groups in India.
4. Critically examine the social systems that affect the growth and development of subaltern groups.
5. To integrate knowledge and field work practice – to understand the realities in the field and to understand interventions, legal provisions and policies and programmes

**UNIT– I: Introduction to Subaltern groups (18 Hours)**

Subalterns – Concept, Meaning, Classifications, demographic characteristics, Problems- Prospects and rationale

**UNIT–II: Status of Scheduled Caste / Scheduled Tribes (18 Hours)**

Concept –Definition- Classification of Scheduled Caste / Scheduled Tribes- Demographic features of Scheduled Caste / Scheduled Tribes and Socio – economic-Political- Cultural-Educational and Religious correlates of Scheduled Caste / Scheduled Tribes - Untouchability and Discrimination of Scheduled Caste / Scheduled Tribes and their problems

**UNIT–III: Status of Women and Children (18 Hours)**

Demographic Profile of Women and Children – Socio-economic-Political –Cultural and religious Correlates of Women and Children- Problems of Women and Children(Causes-Consequences-Remedial Measures)

**UNIT–IV: Social Movement for Emancipation (18 Hours)**

Social Movement-concept-meaning-Definitions-important-classifications of Social movements, the Role of Gandhi- B.R.Ambedkar - Periyar for Social empowerment, Context-Vision-Mission-Strategies- Approaches of Dalit movements(Dalit Panthers Movement & Rashtriya Dalit Adhikar Manch), Tribals Movement (Santhal Movement & Pathalgadi Movement) and Women Movements (Chipko movement & Anti-Arrack Movement)

**UNIT–V: Constitutional provisions and Legislative measures (18 Hours)**

Constitutional provisions and Legislative measures for ST/ST- Protective discrimination and political Will- Liberative Laws-Policies and Programmes for women and Children- UN Declaration of Human Rights -

**Teaching and Learning Methods**

- Class Lecture
- Assignment
- Seminars

- Use of ICT
- Group Discussion
- Case Study
- Exposure Visit
- Field Work
- Internship Training

### Books for Study

Agarwal, Meenu (Edit),(2012),The Changing Status of Women in India Issues and Challenges. Pragun Publications, New Delhi.

Bhusan, Vidya and Sachdeva. (1997), An Introduction to Sociology. KitabMahal, Allahabad.

Chinnala, Bala Ramulu , (2020), Marginalized Communities and Decentralized Institutions in India: Exclusion and Inclusion. Routledge India, New Delhi.

Wilson, John (1973). Introduction to Social Movements. Basic Books, New York.

Rao A.M.A , (2002). Social Movements in India: Studies in Peasant, Tribal and Women's Movement. Manohar Publishers,New Delhi.

### Books for References

Ali Baig, Tara (Ed),(1987). Women of India, Publications Division, Ministry of Information and Broadcasting, Govt of India, New Delhi.

Kapur, Promila, (2000)., Empowering the Indian Women, Publications Division, Ministry of Information and Broadcasting, Govt of India, New Delhi.

Mandar, Harsh & Vidya Rao, (1999), An Agenda for Caring, Interventions for Marginalized Groups, New Delhi: Voluntary Health Association of India.

Rights of the Child, (2002), The Department of Women and Child Development, Ministry of IIRD, Govt. of India, New Delhi.

Sankar Sen, (2005), Trafficking in Women and Children in India, New Delhi: Orient Longman.

Gabrielle, D. (1988). Women's Movement in India: Conceptual and Religious Reflections. Breakthrough: Bangalore.

Shah, Ganshyam (ed.) (2002). Social Movements and the State. Sage Publications: New Delhi

### Course Outcome

Co No	Course Outcome	Levels
1	Identify the various subaltern groups and their problems in the society	K2
2	Plan and organize various social welfare programmes	K3
3	Safeguard and work for the rights of the Schedule caste, Schedule tribes, Women and Children	K3
4	Train and provide technical support to various subaltern groups and social welfare organizations	K3
5	Start social welfare institutions/Movement to work for upliftment of the marginalized communities	K4

### Mapping of Course outcomes with POs and PSOs

(Programme Outcomes – POs, Programme Specific Outcomes – PSOs)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
<b>C1</b>	3	2							3	2				10
<b>C2</b>	2	2	2	3					2	2	1	1	2	17
<b>C3</b>	2	2	2	2	1	1			2	1	2	2	2	19
<b>C4</b>	2	1	2	2	2				2	2	1	2	2	18
<b>C5</b>	2	2	3	2	1				1	1	2	2	2	17
Grand Total of COs with POs & PSOs														81
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{81}{44}$														1.84

**S – Strong; M – Medium; L – Low**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs		<b>1.84</b>	
Observation	<b>COs of Development of Marginalized are moderately correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

<b>Class</b>	<b>: III B.Sc. RDS</b>	<b>Part</b>	<b>: III Core-16</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>: 75</b>
<b>Sub. Code</b>	<b>: 22URDD66</b>	<b>Credit</b>	<b>: 4</b>

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**CORPORATE SOCIAL RESPONSIBILITY FOR RURAL DEVELOPMENT**

(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)

**Course Educational Objectives:**

The course enables the pupil to

1. Understand the concept of corporate social responsibility (CSR)
2. Upgrade knowledge and skills on CSR
3. Acquire skills to frame CSR policies and practices
4. Build Capacity to create a project on CSR
5. Gain knowledge on the implementation on CSR activities

**UNIT I**

**Corporate Social Responsibility (15 Hours)**

Meaning and Definition, Concept, History and evolution, Principles, Concept of charity, corporate philanthropy, corporate citizenship.

**UNIT II**

**Models of Corporate Social Responsibility (15 Hours)**

Trusteeship, stakeholder, Ethical model, Statist model, Liberal model, Contemporary approach on Corporate Social Responsibility

**UNIT III**

**Corporate Social Responsibility Legislation in India (15 Hours)**

Government Policies on CSR; Provision of CSR in companies Act 2013, Companies (Corporate Social Responsibility Policy) Rule 2014, - Constitution of CSR committee, CSR policies, CSR process, CSR Activities.

**Unit IV**

**Corporate and Community Participation (15 Hours)**

Sustainable Development Goals (SDGs) and CSR in Rural Areas, CSR through NGOs, Funding for various CSR activities; Concentration areas- Rural development, Health, Education and Environment.

**Unit V**

**Current trends and Opportunities in CSR (15 Hours)**

Current trends and opportunities in CSR. Case Studies of major CSR activities in India- TVS Motor Company Limited, Tata Steel's Tribal Development Programs, Mahindra & Mahindra's Agribusiness Division, Coca-Cola's Support My School Campaign, Microsoft's Project Shiksha, BHEL Shiksha, ONGC Swachh Bharat Abhiyan

### **Teaching Learning Method**

- ICT based Direct **Instruction**
- Inquiry-based Learning
- Group discussion
- Expeditionary Learning
- Role plays

### **Books for study**

Corporate Social Responsibility in India - Sanjay K Agarwal

Handbook on Corporate Social Responsibility in India, CII.

Handbook of Corporate Sustainability: Frameworks, Strategies and Tools - M. A. Quaddus, Muhammed Abu B. Siddique

### **Books for Reference**

Bhattacharya, C.B., Korschun, D., & Sen, S. (2018). "Dynamics of Corporate Brand Trust in High-Involvement vs. Low-Involvement Products". *Journal of Consumer Marketing*, 35(3), 332-345.

Carroll, A. B. (1999). "Corporate social responsibility: Evolution of a definitional construct". *Business & Society*, 38(3), 268-295.

Chakraborty, S. K. (2017). "Corporate Social Responsibility in India: A Critical Review". *Indian Journal of Corporate Governance*, 10(1), 47-59.

Visser, W. (2010). "The Age of Responsibility: CSR 2.0 and the New DNA of Business". *Journal of Business Systems, Governance & Ethics*, 5(3), 7-22.

Benn & Bolton, (2011). *Key concepts in corporate social responsibility*. Australia: Sage Publications Ltd.

Brummer, J.J. (1991). *Corporate Responsibility and Legitimacy: An interdisciplinary analysis*. Westport, CT: Greenwood Press.

CV. Baxi (2005) *Corporate Social Responsibility – concepts and cases*.

M.Mahmoudi, (2005) *Global Strategic Management*, Deep & Deep Publications Pvt.Ltd, Delhi.

Werther, W. B. & Chandler, D. (2011). *Strategic corporate social responsibility*. Thousand Oaks, CA: Sage

*Corporate Social Responsibility: Concepts and Cases: The Indian* - C. V. Baxi, Ajit Prasad

### **e reference**

<https://www.csr.gov.in/content/csr/global/master/home/home.html>

<https://www.tvsscs.com/corporate-social-responsibility/>

<https://www.tatasteel.com/corporate/our-organisation/csr/>

<https://www.mahindraagri.com/sustainability-csr/>

### Course Outcome

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Outline and discuss the evolution of corporate social responsibility	K1
CO 2	Capable of knowledge on stakeholders of CSR and models of major CSR systems found around the world	K2
CO 3	Enumerate strategies for CSR legislations	K3
CO 4	Build Capacity to create a project on CSR	K4
CO 5	Analyse how CSR influence performance of individual firms	K4

**K1 = Knowledge, K2 = Understanding, K3= Application, K4= Analysis and K5 = Synthesis**

### Mapping of course outcomes with POs and PSOs

(Programme Outcome- POs, Programme Specific Outcome- PSOs)

	P O 1	PO 2	P O 3	PO 4	P O 5	PO 6	PO 7	PO 8	PS O1	PS O2	PSO 3	PS O4	PS O5	Sum of COs with POs & PSOs
CO1	3	2		2					3		2		2	14
CO2	2	2		2				3	2	3	2		2	16
CO3	2	3		2				2	2	2	2		2	17
CO4	2	2	2	3				2	2	2	2		2	19
CO5	1	2	2	2				1	1	2	2		3	16
Grand Total of COs with POs & PSOs														82
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{82}{39}$														2.1

**S – Strong; M – Medium; L – Low**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.1
Observation	COs of CORPORATE SOCIAL RESPONSIBILITY FOR RURAL DEVELOPMENT is strongly correlated with POs & PSOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

Class	: III B.Sc. RDS	Part	: III Core-17
Semester	: VI	Hours	: 60
Sub. Code	: 22URDD76	Credit	: 3

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**RURAL COMMUNITY HEALTH**

(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)

**Course Educational Objectives:**

1. To inform the students about the various dimensions of health.
2. To enlighten the students about personal hygiene and waterborne diseases.
3. To impart the knowledge on communicable diseases
4. To emphasize to the students the importance of health education.
5. To teach students about the health care programs and delivery system

**Unit-I Introduction to Health (12 hours)**

Health- Concept -Definition- Dimensions- Determinants of Health- Concept of Disease-Nature- Models of Intervention: Control and prevention methods-Community Health-Primary Health Care.

**Unit-II Personal and Environmental Health (12 hours)**

Personal Hygiene-Meaning- Definition-Maintenance of Health Physical, health, Mental health- -Various factors determining Personal health – Characteristics of Environmental Health – Meaning, Importance, and Safeguard measures- Waterborne diseases, common cold, Typhoid, cholera and jaundice.

**Unit-III Epidemiology of Disease (12 hours)**

Communicable diseases Tuberculosis, Dengu fever, STI, COVID-19, and Chicken pox. Meaning - Agent and Host factors – Prevention - Disease transmission – Immunity – Disinfection – Definition –Types - Classification.

**Unit-IV Rural Health Education (12 hours)**

Health Education-Meaning – Definition – Approaches - Content-Principles –Practice – Healthcare – Meaning – Concept – Elements – Principles - Primary Health care in India - Primary Health Center (PHC) - Role of NGOs in health education.

**Unit-V Health care delivery services (12hours)**

Health Planning and Management – needs, and Demands - resources – Health System in India – State, district, and block level Health administration - Health programs, Universal Immunization Programme, National Programme for Family Planning, National AIDS Control Programme (NACP), Pulse Polio Programme, National Tobacco Control Programme (NTCP), National Mental Health Programme,- People’s Participation in the Community Health Programme.

**Teaching and Learning Methods**

- Blended learning, Lecture Method
- PPT Presentation Group Discussion
- Case Study / Guest Lectures, Exposure Visits/
- Study assignment/ Videos (E-Content)

### Books for Study

- Park. k. (2000) Preventive and Social Medicine/S Jabalpur: Banarisdas Bhanot Publishing,
- E. Vijay (2002) Community Medicine. Chennai: Beacon Zen.

### Book for References

Rita Jain & Preeti Goel (2004), Health Education. New Delhi: Sports. (Part-2: Section –I- Health Hygiene & Section – II – Family Life Education)  
 S.L.Goel (2004) Health Care Organization & Structure. New Delhi: Deep & Deep.  
 Brett J. Cassens ed., (1990) Preventive Medicine and Public Health. Singapore: John Wailley. (Chapters 1 & 4 – Epidemiology)  
 Rajiv Misra & Others (2003), India Health Report. New Delhi: Oxford  
 Kumar R: Social and Preventive Health Administration,(1992) Asia Publishing House, New Delhi

### E-Resources

[http://www.unnaturalcauses.org/video\\_clips\\_detail.php?res\\_id=80](http://www.unnaturalcauses.org/video_clips_detail.php?res_id=80)  
[https://en.wikipedia.org/wiki/Community\\_health](https://en.wikipedia.org/wiki/Community_health).  
<https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=KxU7J9PwP2w4kchRJ/KZHg==>

### Course outcomes (COs)

S. No	Course outcome After studying the course, the student will be able to	Knowledge level (Bloom's Taxonomy)
CO 1	Understand the causes of human illness	K1
CO 2	Provide information on health, personal hygiene, and waterborne diseases.	K2
CO 3	Become aware of the cause, mode of transmission, and consequences of communicable Diseases	K3
CO 4	Conduct awareness programs on health and personal Hygiene	K4
CO 5	Understand the health programs and functions of the various institutions working for health promotion.	K5

### Mapping course outcome with Programme objective- Programme-specific objective

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of with POs & PSOs
CO1	3		3		3				3	2		1		15
CO2	3	3		3	2				3		3	3		20
CO3	2		3	3	2					3	3			18
CO4	2	3	2		3				2	2		2		16
CO5	3	3	3		2					3	2	2		19
	<b>Grand Total of COs with POs and PSOs</b>													<b>88</b>
	Mean Value of COs with POs & PSO s = Grand total of COs with POs& PSOs / Number Cos relating with POs & PSOs = 88/28 = 25													

S – Strong; M – Medium; L – Low

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			2.5
Observation	<b>COs of RURAL COMMUNITY HEALTH is strongly correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

<b>Class</b>	<b>: III B.Sc. RDS</b>	<b>Part</b>	<b>: III Core-18</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>: 75</b>
<b>Sub. Code</b>	<b>: 22URDD86</b>	<b>Credit</b>	<b>: 4</b>

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**RURAL INDUSTRIES AND MANAGEMENT**

(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)

**Course Educational Objectives:**

1. To introduce the basic concepts related to rural industries
2. To provide inputs about the function of various institutions promoting rural industries
3. To make them aware of appropriate technology and its growing needs.
4. To impart knowledge and skills related to Marketing of rural products and services.
5. To facilitate the students to identify various avenues and opportunities to become rural entrepreneurs.

**Unit – I: Rural Industries (15 Hours)**

Meaning- Characteristics of Rural Industries - Classification of Rural Industries -Need for rural industrial development in India – Scope - Significance– Rural industries and Rural Development.

**Unit – II: Institutions promoting rural industries (15 Hours)**

Policies in favour of rural industries - Institutions promoting rural and small-scale industries: DIC, KVIC, Industrial Estate, NABARD - MSME- MSME Act 2006, - Startup TN – TANSIM

**Unit – III Appropriate Technology (15 Hours)**

Meaning– History- Need for appropriate Technology – Advantages of Appropriate Technology –Factors determining the appropriateness of technology in a given community - Appropedia

**Unit – IV: Rural Marketing (15 Hours)**

Rural Marketing –Marketing Mix - Marketing activities– Networks and Partnership in Rural Markets: CAPART: Gram Sree Melas –RUDA - MART Rural solutions – TNRTP – Valzhnthu Kattuvom project – Project shakti –RBHs - Problems in Marketing – Impact of Globalization on Rural Industries – e-marketing

**Unit – V Entrepreneurship Development (15 Hours)**

Definition – Concept – Characteristics – Types of Entrepreneur- Function of an Entrepreneur – Women Entrepreneurship – Women Entrepreneurs and Employment Generation - Rural Entrepreneurship - Social Entrepreneurship - Opportunities for self-employment in rural areas – Case studies of Successful Rural Enterprises. Make in India- Business Idea Generation and Development of Business Plan

**Teaching and Learning Methods**

- Class lectures
- PPT presentations
- Assignments
- Visits to Rural industries and Government agencies
- Interaction with experienced and successful entrepreneurs
- Case study
- Group Discussions

**Books for study:**

Desai, Vasant, (1999), *Small Scale Industries and Entrepreneurship*, Hyderabad: Himalaya Publishing House.

Dayanandan, R and A. Nilasco Arputharaj, (2012), *Entrepreneurship Development and Small Business Management*, New Delhi: Deep & Deep Publications Pvt. Ltd.

Verma, Nina, (2019), *Management of Rural Entrepreneurship*, New Delhi: Global Vision Publishing House.

**Books for Reference:**

Rao, R.V., (1976), *Rural Industrialization in India*, Bombay: Vikas Publishing Co.

Sundaram, J.D, (1985), *Small Industries and Developing Economy*, New Delhi: Concept Publishing Co.

Sen, K.K, (1989), *Rural Industrialization in India*, New Delhi: Sultan Chand & Sons.

Soundarapandian, (1999,) *Rural Industrialisation*, New Delhi: Motilal Banarsidas.

Renu Arora (2003), *Fundamentals of Entrepreneurship of small Business*, New Delhi: Kalyan Publishers.

**e-References**

<https://egyankosh.ac.in/bitstream/123456789/59477/1/Unit3.pdf>

<https://egyankosh.ac.in/bitstream/123456789/32615/1/Unit-5.pdf>

<https://www.yourarticlelibrary.com/economics/factors-influencing-the-choice-of-techniques-in->

[economics/47507https://www.gbpssi.in/admin/coursepack/MBR617Lect02.pdf](https://www.gbpssi.in/admin/coursepack/MBR617Lect02.pdf)

**Course Outcomes**

After completing this course, the students will

CO. No.	Course Outcome	Level
1.	Understand the importance and the scope of rural industries in India	K2
2.	Become aware of different institutions that promote rural industries.	K2
3.	Realize the needs and the benefits of appropriate technology	K2
4.	Gain knowledge and skills about marketing of rural products and services in the backdrop of globalization with its impact.	K3
5.	Identify the opportunities to become self-employed and motivated to become rural entrepreneurs.	K4

### Mapping of Course Outcomes with POs and PSOs

(Programme Outcome- POs, Programme Specific Outcome- PSOs)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
<b>CO1</b>	3	2							3	2				10
<b>CO2</b>	3	2							3	2				10
<b>CO3</b>	3	2							3	2				3310
<b>CO4</b>	2		2	2		3			2	2	2	3		18
<b>CO5</b>	2	2		2		3				3	3	3		18
Grand Total of COs with POs & PSOs														66
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{66}{27}$														2.44

**S – Strong; M – Medium; L – Low**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs & PSOs			<b>2.44</b>
Observation	<b>COs of RURAL INDUSTRIES AND MANAGEMENT is strongly correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

Class	: III B.Sc., RDS	Part	: III Core Practical
Semester	: VI	No. of Days	: 15
Sub. Code	: 22URDP66	Credits	: 5

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**Course Educational Objective**

1. To impart practical knowledge in dairy, poultry and agriculture farming and social welfare institutions
2. To provide necessary knowledge about starting and running of poultry, dairy and rural development organizations.
3. To be acquainted with various policies and programme
4. To understand the various problems involved in the running of farm and social work institutions
5. To develop skills related to running of the dairy, poultry and agricultural farming and rural development programmes.

**III B.Sc – Internship Training Programme**

**General Guidelines**

Internship Training Programme is one of the important components in B.Sc Rural Development Science course. It is given to III B.Sc students during the sixth semester to equip them with professional skills and employment opportunities. It is part and parcel of the integrated rural development practical and is also a partial requirement for the completion of the B.Sc RDS course.

**The General guidelines for the Internship Training Programme**

1. Internship training programme aims at skill development professional training in the fields of NGO Management, Agricultural Sciences and Animal Husbandry.
2. To interrelate theory with practice and make the students as development personnel, based on the theoretical and practical knowledge they acquired in the class room/lab/ field.
3. The students may be placed (off campus) in any one of the organizations related to the subject they are taught (Social Science (NGOs, CBOs, Rural Industries,)), Animal Husbandry Farms, Dairy Industries, Agricultural Farms and Agro industries)
4. Internship Training Programme for III B.Sc students will be given in the sixth semester, preferably middle of the semester for 15 full days from morning 9.00 am to 4 pm. The Students will follow the working office hours of the organization.
5. Health factors and financial situation of the students should be considered while allotting the organization for the internship training.
6. All the expenses incurred during the internship training programme shall be borne by the students completely.
7. A team of teaching staff will be assigned for the fixing of the organizations, intermittent visits during the internship training, report submission, correction and evaluation with the consultation of the Head of the Department.
8. Internship training is part of the semester Integrated Rural Development Practical and it is mandatory for every students to complete the IRD practical and no one is

exempted from the internship training programme and failing to complete the internship training will be treated as arrears in the IRD practical.

9. No relaxation and changes will be entertained in the internship training programme.
10. The students should go for the field work without fail and follow the organizational norms and guidelines and this should be strictly adhered to during the time of internship training.
11. The students should write report of everyday activities and final consolidated report for the purpose of Integrated Rural Development Practical. The reports should be submitted at the end of the Internship training to the allotted staff in-charge.
12. It is advised that the students should follow the general format given by the department for writing the report.
13. Any difficulties faced by the students during the internship training programme must be brought to the notice of the team of staff and the HOD in order to take immediate necessary action.

### **Evaluation Procedure**

1. Internship Training programme will be evaluated for 100 marks.
2. For 50 marks, the students are evaluated by the institutions in which they are placed.
3. The students must be assessed based on the following five criteria, they are
  - i. Regularity
  - ii. Adaptation to the working environment
  - iii. Work consciousness and creative initiatives
  - iv. Working ability and skills acquired
  - v. Report

Internal Viva voce will be conducted for the internal 50 marks by the department at end of the semester after receiving the internship training marks along with the report from the concerned agency with consolidated final report.

### **Course Outcomes**

After completing this course, the students will

<b>CO. No.</b>	<b>Course Outcome</b>	<b>Level</b>
1.	Practice the classroom learning in the field of rural development, Agriculture and Animal husbandry	K3
2.	Plan and start social Welfare organizations Agricultural and animal husbandry farm	K3
3.	Conduct training programmes on Rural development /Agricultural and animal Husbandry	K3
4.	Train and provide technical support to farmers and NGOs	K3
5.	Become an entrepreneur	K3

### Mapping of course outcomes with POs and PSOs

(Programme Outcome- POs, Programme Specific Outcome- PSOs)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
<b>CO1</b>	3	3	3	2	2				3	3	1	2	1	20
<b>CO2</b>	2	2	3	3	3				1	2	1	2	2	18
<b>CO3</b>	3	2	3	3	3				3	3	2	3	1	26
<b>CO4</b>	2	2	2	2	2				2	3	2	2	1	20
<b>CO5</b>	3	3	3	3	2				2	2	2	2	2	24
Grand Total of COs with POs & PSOs														106
Mean Value of COs with POs & PSOs = $\frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}} = \frac{106}{50}$														2.16

**S – Strong; M – Medium; L – Low**

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.1-3
Quality	Low	Medium	Strong
Mean Value of COs with POs and PSOs			2.16
Observation	COs of internship are strongly correlated with POs and PSOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

**Class : III B.Sc. RDS**

**Part : III Core Elective-2**

**Semester : VI**

**Hours : 45**

**Sub. Code : 22URDE26**

**Credit : 3**

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**ANIMAL PRODUCTS MARKETING**

**(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)**

**Course Educational Objectives**

1. To enable the learners acquire basic knowledge of livestock production and technical parameters
2. To make the pupil comprehend various costs of livestock management
3. To facilitate students in learning the cost of economics in an area related to small scale dairy units and industry.
4. To assist the novice in knowing the nuances of market management and market research
5. To help the learners gain in-depth knowledge on credit facilities for dairy products

**Unit –I: Livestock and Animal products**

**(9 Hours)**

Current status of Livestock and Farm Animal Products Market- Regional, National and International; Introduction to Production parameters in Farms- Dairy, Sheep and Goat, Piggery and Broiler and Layer, Turkey and Quails. Introduction to Technical parameters of marketing animal products- Dairy, Sheep and Goat, Piggery and Broiler and Layer, Turkey and Quails.

**Unit-II: Cost Concepts**

**(9 Hours)**

Cost Concept-Investment-Fixed Cost-variable cost, Average cost and total cost-cost benefit ratio-breakeven analysis- livestock insurance.

**Unit-III Working out the Economics**

**(9 Hours)**

Dairy units-10 cows - 10 buffaloes - Layer Unit -1000 Birds- Sheep unit-20+1- Broiler Unit-500Birds- Goat Unit-10+1 -Turkey Unit- 50 Birds -Piggery unit-10+1- Quail Unit -1000 birds

**Unit-IV: Marketing**

**(9 Hours)**

Definition of market – concepts in marketing– classification of markets – Marketing channels -problems – marketing costs and margin – planning , Marketing regulation and certification-Product and its sales-methods of sales – Limitations -- PFA, AGMARK, BIS and FSSAI. Organization related to marketing.

**Unit V: Credit Facilities**

**(9 Hours)**

Credit facilities – Institutional credits-types and mode of repayment-livestock project formulation and submission-NABARD Model-Project appraisal-norms and standard for appraisal-Monitoring, Evaluation-M& E Tools –MIS.

**Teaching Learning Methods**

- ICT, Seminar
- Field visit
- Assignments and Quiz
- Video and Live Demonstration etc.,

### Books for study

Gopalakrishnan, C.A., (1980). Livestock and Poultry enterprises for Rural Development, Mohan Pramlani Publishers, New Delhi,.

Books for reference:

A.S.Kahlon, Karam Singh, (1981). Economics of Farm Business Management in India Allied Publishers Private Limited.

C.P.Annathakrishnan and B.N.Padmanabhan, (1989). Dairy farming and Milk Production. Madras: Shri Lakshmi Publications,

Banerjee, G. C. (2013). A Text book of Animal Husbandry, Oxford & IBH Publishing Company, New Delhi,

Hand Book of Animal Husbandry (2015) ICAR, New Delhi

### Books for reference

S.S.Johl and T.R.Happer, (1973). Fundamentals of Farm Business Management. Kalyani Publishers.

R.S.N.PillaiBagavathi, (2002). Modern Marketing Principles and Practices, S.Chand & Company Ltd. New Delhi

### Course Outcome

Course Outcome No.	Course Outcome	Knowledge Level upto
CO1	Discuss about the Milk Production and Consumption in India and Global level–Milk Secretion	K2
CO2	Find the various stages of milk processing	K3
CO3	Illustrate the fermented whole milk products	K3
CO4	Summarize the various Classified Butter Fat Products	K2
CO5	Explain the different types of Storage of Milk Products and Marketing.	K2

### Mapping of course outcomes with POs and PSOs

(Programme Outcome- POs, Programme Specific Outcome- PSOs)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
CO1	3	3		2	2				3		2	2	2	19
CO2	3	3	2	2	2				3	2	3	2	3	25
CO3	3	3	2	2	2				3	2	3	2	3	25
CO4	3	3		2	2				3		2	2	2	19
CO5	3	3		2	2				3		2	2	2	19
Grand Total of COs with POs & PSOs														107
$\text{Mean Value of COs with POs \& PSOs} = \frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}}$														2.43

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs with POs &amp; PSOs</b>			<b>2.43</b>
<b>Observation</b>	<b>COs of ANIMAL MILK PRODUCTS MARKETING is strongly correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

**Class** : III B.Sc. RDS  
**Semester** : VI  
**Sub. Code** : 22URDSL6

**Part** : SLC  
**Hours** :  
**Credit** : 3

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**MILK PRODUCTS**

(For Students admitted from the Academic Year 2022-2023 onwards under the New CBCS Pattern)

**Course Educational Objectives:**

1. To make them understand the importance of milk in human life.
2. To impart knowledge about the composition of milk.
3. To know about processing of milk.
4. To impart knowledge on preparation of various milk products.
5. To expose the students to various self-employment opportunities related dairy industry.

**Unit I**

**Milk**– Definition – Milk Production and Consumption in India and Global level–Milk Secretion – Composition Indian Standards on Milk – Food and Nutritive nature of milk.

**Unit II :**

**Milk and Public Health**, Clean Milk Products, Milk Grading – Sampling – Weighing Testing – Preheating – Cooling Pasteurization – Homogenization – Standardisation – Storage of milk.

**Unit III :**

**Fermentation** – Indian whole milk products – kheer – Khoa – Kulfi \_Rabri.Coagulated Milk Products – Dahi – Srikhand – Paneer – Chhana.

**Unit IV :**

**Classified Butter Fat Products.** Makkan (Butter), Ghee, Lassi (Butter Milk)

**Unit V :**

**Commercial Products**- Quality checks- Standards National and International- Methods of packaging- Storage conditions- Details on the packages- Types of Markets- Methods of marketing- Digital marketing- Scope of milk products marketing.

Teaching Learning Methods :

- Two contact classes per semester
- Preparation of assignments

**Book for study :**

Sukumar, D.E., (2004), Outlines of Dairy Technology, London: Oxford University Press.

**Books for Reference:**

Boghart Ralph, (1988), Scientific Farm Animal Production, New Delhi:Surjeet Publications., Clarence Henry, E., (1973), Milk and Milk Products, New Delhi: Tata

McGraw Hill Publishing Co. Ltd.,

Schmid, (1982), Principles of Dairy Science, New Delhi: Surjeet Publications.,

Sharma, R., (2006), Production, Processing and quality of milk products, IBDC, 1<sup>st</sup> ed.

**Course Outcomes :**

Course Outcome No.	Course Outcome	Knowledge Level upto
<b>CO1</b>	Discuss about the Milk Production and Consumption in India and Global level–Milk Secretion	<b>K2</b>
<b>CO2</b>	Find the various stages of milk processing	<b>K3</b>
<b>CO3</b>	Illustrate the fermented whole milk products	<b>K3</b>
<b>CO4</b>	Summarize the various Classified Butter Fat Products	<b>K2</b>
<b>CO5</b>	Explain the different types of Storage of Milk Products and Marketing.	<b>K2</b>

**Mapping of course outcomes with POs and PSOs**

(Programme Outcome- POs, Programme Specific Outcome- PSOs)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with POs & PSOs
<b>CO1</b>	3	3		2	2				3		2	2	2	19
<b>CO2</b>	3	3	2	2	2				3	2	3	2	3	25
<b>CO3</b>	3	3	2	2	2				3	2	3	2	3	25
<b>CO4</b>	3	3		2	2				3		2	2	2	19
<b>CO5</b>	3	3		2	2				3		2	2	2	19
Grand Total of COs with POs & PSOs														107
$\text{Mean Value of COs with POs \& PSOs} = \frac{\text{Grand Total of Cos with POs \& PSOs}}{\text{Number of Cos relating with POs \& PSOs}}$														2.43

**S– Strong; M – Medium; L – Low**

Mapping Scale	1	2	3
<b>Relation</b>	0.01-1.0	1.01-2.0	2.1-3
<b>Quality</b>	Low	Medium	Strong
<b>Mean Value of COs With POs &amp; PSOs</b>			<b>2.43</b>
<b>Observation</b>	<b>COs of MILK PRODUCTS is strongly correlated with POs &amp; PSOs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**(CBCS Pattern For the Students who have joined from 2023-24 onwards)**  
**DEPARTMENT OF RURAL DEVELOPMENT SCIENCE**

<b>SEMESTER I</b>				
<b>Part</b>	<b>Sub. Code</b>	<b>Title of the Paper</b>	<b>Hours</b>	<b>Credits</b>
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil/Hindi/French	6	4
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream - B	5	4
III	22URDC11	Core-1 Fundamentals of Life Sciences	5	4
	22URDC21	Core-2 Basics of Farm Animal Management	5	4
	22URDP11	IRD Practical	2	2
	22URDA11	Allied-1 Introduction to Rural Society	5	4
IV	22UFCE11	FC – Personality Development	1	1
	22UCSH12	Communication Skill	1	-
	22UBRC11	Bridge Course	-	1
V	22UNCC/NSS/ PHY.EDU./ YRC/ ROT/ACF/NCB12	Extension Activities NCC/NSS/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	-	-
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>SEMESTER II</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil / Hindi /French	6	4
II	22UENA22/ 22UENB22	English through Prose & Short Story – Stream A English through Prose & Short Story – Stream B	5	4
III	22URDC32	Core-3 Dynamics of Rural Development	5	4
	22URDC42	Core-4 Introduction to Agriculture	5	3
	22URDP22	IRD Practical	2	2
	22URDA22	Allied-2 Energy Science	5	4
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skill	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NCC/NSS/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	-	1
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>SEMESTER III</b>				
		Tamil	5	2
III	22URCA53/ 22URCH53/ 22URCS53	Core-5 Agronomy of Field Crops/ Dairy Husbandry/ Participatory Rural Appraisal	3	3

	22URCA63/ 22URCH63/ 22URCS63	Core-6 Agronomy of Horticultural Crops/ Milk and Milk Products/Gender, Society and Development	3	3
	22URCA73/ 22URCH73/ 22URCS73	Core-7 Agricultural Entomology / Farm Management Practice-I /Human Behaviour in Rural Society	3	3
	22URAP33/ 22URHP33/ 22URSP33	IRD Practical	5	4
IV	22URDA33	Allied-3 Community Based Disaster Management	4	2
	22URDN13	NME-1 Contemporary Social Problems in India (for Science students)	3	2
	22USBZ13	SBE-1- Fundamentals of Computer, Internet and Office Automation	1	1
	22USBY13	SBE-1- Fundamentals of Computer, Internet and Office Automation – Practical	2	1
	22UFCE34	Environmental Studies	1	1
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC / NSS / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
	22UARE14	ARISE	-	-
		<b>Total</b>	<b>30</b>	<b>22</b>
<b>SEMESTER IV</b>				
		Tamil	5	2
III	22URCA84/ 22URCH84/ 22URCS84	Core-8 Plant Pathology/ Poultry Husbandry/ Rural Economics	3	3
	22URCA94/ 22URCH94/ 22URCS94	Core-9 Organic Farming/ Pig Farming / Science and Technology for Rural Development	3	3
	22URCA04/ 22URCH04/ 22URCS04	Core-10 Agricultural Bio-Technology / Farm Management Practice-II / Youth Empowerment and Policies	3	3
	22URAP44/ 22URHP44/ 22URSP44	IRD Practical	5	4
	22URDA44	Allied-4 Communication and Extension	4	2
IV	22URDN24	NME-2 Food Preservation	3	2
	22USBE34	SBE-1- Web Design	1	1
	22USBP34	SBE-1- Web Design – Practical	2	1
	22UFCH44	FC-Religious Literacy and Peace Ethics	1	1
V	22UNSS/NCC/	Extension Activities NSS / NCC / Phy.Edn. / YRC	-	1

	PED/YRC/ROT/ ACF/NCB12	/ ROTARACT / AICUF / Nature Club		
	22UARE14	ARISE	-	1
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>SEMESTER V</b>				
III	22URDD15	Core-11 Social Welfare Administration	6	5
	22URDD25	Core-12 Community Based Organisation	4	3
	22URDD35	Core-13 Rural Social Problems	4	3
	22URDD45	Core-14 Social Research Methodology	6	5

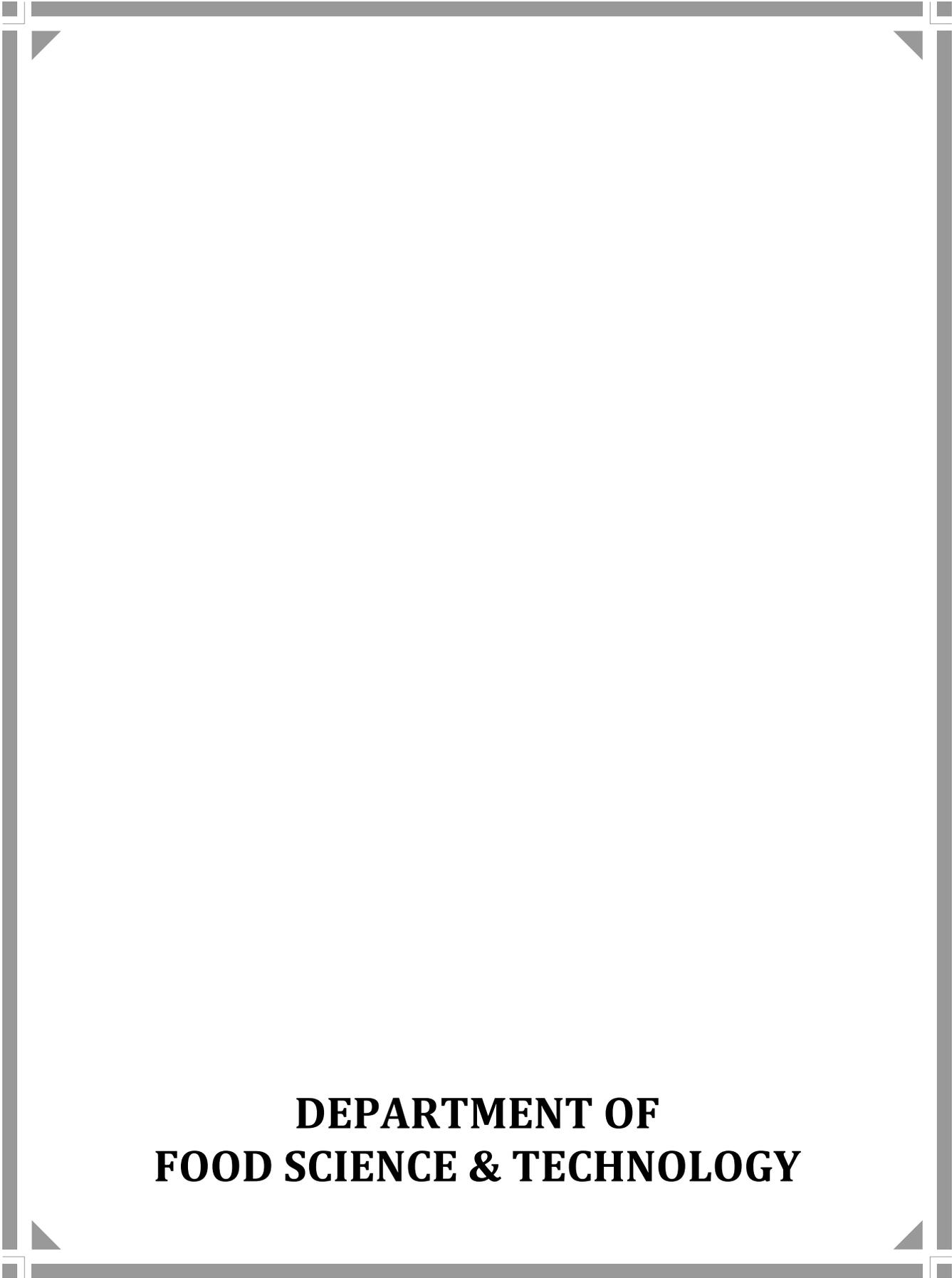
	22URDP55	IRD Practical	5	5
	22URDE15	Core Elective-1 Commercial Agriculture	3	3
IV	22USSI16	Soft Skills	2	
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>SEMESTER VI</b>				
III	22URDD56	Core-15 Development of the Marginalised	6	5
	22URDD66	Core-16 Corporate Social Responsibility for Rural Development	5	4
	22URDD76	Core-17 Rural Community Health	4	3
	22URDD86	Core-18 Rural Industries and Management	5	4
	22URDP66	IRD Practical – 15 day internship programme	5	5
	22URDE26	Core Elective-2 Animal Products Marketing	3	3
IV	22USSI16	Soft Skills	2	2
		<b>Total</b>	<b>30</b>	<b>26</b>

SEMESTER	I	II	III	IV	V	VI	TOTAL
CREDITS	24	24	22	24	25	25	144

Part – I	08
Part – II	08
Part – III	
Core	87
Allied	16
Core Electives	06
Total	108
Part – IV	
Non-Major Electives	04
Skill based Electives	04
Value Education	04
Total	12
Part – V	02
Bridge Course	01
Arise	01
Communication Skill	01
Soft Skill	02

<b>SELF LEARNING COURSES</b>			
<b>Semester</b>	<b>Sub. Code</b>	<b>Paper</b>	<b>Credit</b>
III	22URDSL3	Human Rights	3
IV	22URDSL4	Aquaculture	3
V	22URDSL5	Mushroom Production	3
VI	22URDSL6	Milk Products	3





**DEPARTMENT OF  
FOOD SCIENCE & TECHNOLOGY**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**B.Sc., Food Science and Technology**

**(Under Choice-Based Credit System from the Academic year 2022-2023 onwards)**

<b>I SEMESTER</b>				
<b>PART</b>		<b>PAPER</b>	<b>Hrs</b>	<b>Cr</b>
I	22UTML11/ 22UHNL11/ 22UFNL11	Tamil/ Hindi/ French	6	4
II	22UENB11	English through Prose & Short Story (Stream B)	5	4
III	22UFSC11	Core -1 Principles of Food and Nutrition	5	4
	22UFSC21	Core-2 Fundamentals of Food Science	4	4
	22UFSP11	Core Lab –I Food Science and Nutrition Lab	3	2
	22UFSA11	Allied -1 Principles of Food Production	3	3
	22UFSQ11	Allied Lab-1 Food Production Lab	2	1
IV	22UFCE11	FC-Personality Development	1	1
	22UCSH11	Communication Skills	1	
	22UBRC11	Bridge Course		1
V	22UNSS/NCC/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club		-
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>II SEMESTER</b>				
I	22UTML22/ 22UHNL22/ 22UFNL22	Tamil/ Hindi/ French	6	4
II	22UENB22	English through Prose & Poetry (Stream B)	5	4
III	22UFSC32	Core -3 Nutritional Biochemistry	5	4
	22UFSC42	Core-4 Fundamentals of Food Technology	4	3
	22UFSP22	Core Lab-2 Nutritional Biochemistry & Food Technology Lab	3	2
	22UFSA22	Allied – 2 Fast Foods and Snacks Technology	3	3
	22UFSQ22	Allied Lab -2 Fast Foods and Snacks Technology Lab	2	1
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skills	1	1
V	22UNSS/NCC/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	---	1
		<b>Total</b>	<b>30</b>	<b>24</b>

III SEMESTER				
III	22UFSC53	Core -5 Food Engineering	5	4
	22UFSC63	Core-6 Technology of Cereals, Pulses and Oilseeds	5	4
	22UFSP33	Core Lab-3 Food Engineering & Technology Cereals , Pulses and Oilseeds and Food safety Lab	4	2
	22UFSC73	Core-7 Food safety and Toxicology	4	3
	22UFSA33	Allied- 3 Bakery and Confectionary Products	3	3
	22UFSQ33	Allied Lab -3 Bakery and Confectionary Lab	2	1
IV	22USBZ13	Skill Based Elective- 1 Fundamentals of Computer, Internet and Office Automation	1	1
	22USBY13	Fundamentals of Computer, Internet and Office Automation- Practical	2	1
	22UFSN13	Basic Tamil/Advanced Tamil/Non-Major Elective : Basics of Food Science	3	2
	22UFCE33	FC-Environmental Studies	1	1
V	22UNSS/NCC/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NSS / NCC /Phy.Edn./ YRC / ROTARACT / AICUF / Nature Club	-	-
	22UARE14	ARISE		
		<b>Total</b>	<b>30</b>	<b>22</b>
IV SEMESTER				
PART		PAPER	Hrs	Cr
III	22UFSC84	Core -8 Food Processing and Engineering	5	4
	22UFSC94	Core- 9 Technology of Fruits, Vegetable and Plantation Crops	5	4
	22UFSD04	Core-10 Dairy Technology	4	3
	22UFSP44	Core Lab-4 Food Processing and Engineering, Technology of Fruits, Veg. and Dairy Lab	4	2
	22UFSA44	Allied- 4 Food Microbiology	3	3
	22UFSQ44	Allied Lab -4 Food Microbiology Lab	2	1
IV	22USBZ24	Skill-Based Elective- 2 Web Design	1	1
	22USBY24	Web Design- Practical	2	1
	22UFSN24	Basic Tamil/Advanced Tamil/Non-Major Elective - Basics of Nutrition	3	2
	22UFCH44	FC- Religious Literacy and Peace Ethics	1	1
V	22UNSS/NCC/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
	22UARE14	ARISE		1
		<b>Total</b>	<b>30</b>	<b>24</b>

<b>V SEMESTER</b>				
III	22UFSD15	Core-11 Technology of Meat and Poultry	6	6
	22UFSD25	Core-12 Research Methodology and Statistics	5	5
	22UFSP55	Core Lab-5 Technology of Meat, Poultry & Food safety Lab	4	2
	22UFSD35	Core-13 Food Quality Testing and Evaluation	6	6
	22UFSP65	Core Lab-6 Food Quality Testing Lab	3	2
	22UFSE15	Core Elective 1–Food Quality Management /Food Laws and Regulations	4	3
IV		Soft Skill	2	
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>VI SEMESTER</b>				
III	22UFSD46	Core 14 Technology of Sea Foods	6	6
	22UFSP76	CoreLab-7 Technology of Sea Foods Lab	3	2
	22UFSD56	Core 15-Project Management and Entrepreneurship	5	5
	22UFSD66	Core 16- Food Beverage Technology	6	6
		CoreLab-7 Food Beverage Technology Lab	4	2
	22UFSE26	Core Elective–2 Food Product Development & Marketing/Food Packaging and Labelling	4	3
IV		Soft Skill	2	2
		<b>Total</b>	<b>30</b>	<b>26</b>

#### Self Learning Courses

Sem	Sub. Code	Title of the Paper	Credits
III	22UFSSL3	Basics of Food Preparation	3
IV	22UFSSL4	Food Preservation	3
V	22UFSSL5	Food Safety	3
VI	22UFSSL6	Food Processing	3

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.**  
**DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY**

<b>Course Code &amp; Title</b>	<b>Technology of Meat and Poultry (22UFSD15)</b>		
<b>Class</b>	<b>III-FST</b>	<b>Semester V</b>	<b>Hours: 90</b>
<b>Cognitive Level</b>	<b>K-1</b> Knowledge <b>K-2</b> Understanding <b>K-3</b> Application		
<b>Course Educational Objectives</b>	The course aims to enable the students to <ul style="list-style-type: none"> <li>• Learn about the characteristics of various meat and Poultry.</li> <li>• Gain the knowledge on slaughter process of different meat.</li> <li>• Study about meat quality and products.</li> <li>• Specify the methods used in meat preservation and Products.</li> <li>• Know about the complete processing, preservation and quality analysis of egg.</li> </ul>		
<b>UNIT</b>	<b>Content</b>		<b>No. of Hours</b>
I	<b>Meat:</b> Introduction- Definition, composition, Nutritive Value, classification, characteristics and Structure of meat. <b>Poultry:</b> Definition, composition, Nutritive value and Classification. Development of meat and poultry industry in India and its need in nation's economy.		18
II	<b>Slaughter process:</b> Slaughter- Definition, Anti-mortem examination of meat animals, Dressing of carcasses, slaughter Processing of Cow/Buffalo, Sheep/ Goat, Pig and Poultry. Post-mortem examination of meat; Different cuts of Beef, Mutton, Pork and Chicken.		18
III	<b>Meat and Poultry Quality:</b> Define -Meat Quality. Meat freshness. Assessment of Meat and Poultry Quality-color, flavor, texture, pH, Water-Holding Capacity (WHC) and Emulsification capacity. Sensory quality of processed meat and chicken. <b>Abnormalities of meat.</b> Psychological and pathological abnormalities. Dark Firm Dry (DFD), Pale Soft Exudate (PSE). Spoilage of Meat and Meat Products. Quality control assessments.		18

IV	<p><b>Meat Preservation:</b> Refrigeration, freezing, thermal processing, Meat Curing, Meat Pickling, canning of meat, retort pouch, dehydration, irradiation, and RTE. Packaging and Storage methods of meat.</p> <p><b>Products:</b> Ham, Sausages, Bacon, Fermented Meat products, Processed Pork Meat flavors and Meat Pickle.</p>	18
V	<p><b>Egg: Industry and Production Practices</b> Broiler Coordination Committee (BCC), Egg Coordination Committee (ECC). Preservation of eggs - Refrigeration and freezing, thermal processing, dehydration, coating. Quality identification and defects of Eggs. Factors affecting egg quality and measures of egg quality. Processed Egg products – egg powder, egg white isolates.</p>	18
<b>Text Books</b>	<ul style="list-style-type: none"> <li>• Lawrie R A, (1998) Lawrie’s Meat Science, 5th Ed, Wood head Publisher, England.</li> <li>• Sharma. B.D, &amp; Sharma. K (2000), Outline of Meat Science and Technology.</li> <li>• Parkhurst &amp; Mountney (1997) Poultry Meat and Egg Production, CBS Publication, New Delhi.</li> <li>• Pearson &amp; Gillet, Processed Meats, 3 Ed, CBS Publication, New Delhi, 1997</li> </ul>	
<b>E Learning Sources</b>	<ul style="list-style-type: none"> <li>• <a href="https://ebooks.inflibnet.ac.in/ftp6/">https://ebooks.inflibnet.ac.in/ftp6/</a></li> <li>• <a href="https://books.google.co.in/books/about/Textbook_on_Meat_Poultry_and_Fish_Techno.html?id=LaUPrgEACAAJ&amp;redir_esc=y">https://books.google.co.in/books/about/Textbook_on_Meat_Poultry_and_Fish_Techno.html?id=LaUPrgEACAAJ&amp;redir_esc=y</a></li> <li>• <a href="https://www.astralint.com/book/9789351243441/textbook-on-meat-poultry-and-fish-technology">https://www.astralint.com/book/9789351243441/textbook-on-meat-poultry-and-fish-technology</a></li> </ul>	
<b>Books for Reference</b>	<ul style="list-style-type: none"> <li>• The Complete Technology book on Meat, Poultry and Fish Processing, 2<sup>nd</sup> Revised Edition by NPCS Board of Consultants and Engineers.</li> <li>• Desrosier, N.W and James.N, Technology of food preservation, AVI Publisher.</li> <li>• Stadelman W.J, Owen J Cotterill, Egg Science and Technology, 4th Ed. CBS Publication New Delhi, 2002.</li> <li>• Hagstad, H.V and Hubbert, W.T, Food quality Control, Foods of Animal Origin, Lawa state, University Press, AMES</li> </ul>	

### Course Outcome

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom’s Taxonomy)
CO <sub>1</sub>	Explain the Composition, classification and Characteristics of meat and also know about the	K3

	development of meat and poultry industry in India	
CO <sub>2</sub>	Apply various slaughter processes, Anti Mortem and Post Mortem Examination of Meat.	K4
CO <sub>3</sub>	Analyse the abnormalities and qualities of meat.	K4
CO <sub>4</sub>	Attributes to the knowledge about techniques in preservation of meat; and determine various meat and poultry products	K3
CO <sub>5</sub>	Know about various methods of preservation and quality management and processing of eggs	K4

K1= Remember, K2= Understand, K3 = Apply, K4= Analyze, K5= Synthesis

### Mapping of COs with PSOs & POs:

	PO								PSO					Sum of COs with PSOs & POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3	3	3	3	1	3	2	3		2	3		29
CO2	3	3	2	1	3	3	3	2	3			3		26
CO3	3	3	1	2	3	3	3	1	3	3	3	3	3	32
CO4	3	3	1	3	3	3	3	1	3	3	3	3	3	35
CO5	3	3	2	3	3	3	3	3	3	3	3	3	3	38
Grand total of COs with PSOs and POs													160	
Grand Total of COs with PSOs and POs													2.67	
Mean Value of COs with PSO and POs $= \frac{\text{Sum of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = (160/60)$														

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.67
Observation	COs of Technology of Meat and Poultry related to a strong extent with PSOs and POS		

## DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code & Title		Research Methodology and Statistics (22UFSD25)		
Class		III-FST	Semester V	Total Hours: 75
Cognitive Level		K-1 Knowledge K-2 Understanding K-3 Application		
Course Educational Objectives		<p>The course aims to enable the students to</p> <ul style="list-style-type: none"> <li>• Basic knowledge on Research Methods and its utilization.</li> <li>• Study the systematic method of data collection and interpretation.</li> <li>• The Recent software involved in qualitative and quantitative analysis of results.</li> <li>• Learn the basic statistical Parameters and sampling</li> <li>• Know about the testing of hypothesis</li> </ul>		
UNIT	Content			No. of Hours
I	<p><b>Introduction to Research:</b> The concept of research, characteristics of good research, Application of Research, Meaning and sources of Research problem, characteristics of good Research problem.</p> <p><b>Types of Research:</b> Types of research, pure (basic, fundamental) and applied research, qualitative and quantitative. Research Design: Meaning, need, types of research design.</p>			15
II	<p><b>Sampling, Data Collection and analysis:</b> Types and sources of data: Primary and secondary, Methods of collecting data, Concept of sampling and sampling methods</p> <p><b>Research Report:</b> Research report and its structure, journal articles: Components of journal article. Referencing styles and bibliography.</p>			15
III	<p><b>ICT Tools for Research:</b> Tabulation and graphical presentation of research data and software tools. SPSS, Packaging and Printing Softwares</p> <p><b>Web search:</b> Platforms of Research – ResearchGate, Google Scholar, PubMed, Web of Science, Scopus</p>			15
IV	<p><b>Measures of central tendency</b> – arithmetic mean, mean, median and mode</p> <p><b>Measures of dispersion</b> – range – quartile deviation – standard deviation</p> <p><b>Sampling theory</b> – population – finite and infinite population – parameter – sample – statistic – sampling – need for sampling-types of sampling</p>			15
V	<p><b>Test of significance</b> – null and alternative hypothesis – Type I and Type II errors – critical region – level of significance – degrees of freedom</p> <p><b>t-test</b> – testing the significance of single mean</p> <p><b>F-test</b> for equality of two variances</p>			15

<b>Books for Reference</b>	1. Donald Cooper and PS Schindler (2009), Business Research Methods, 9th edition, Tata McGraw Hill. 2 Uma Sekaran (2010), Research Methods for Business, 4th edition, Wiley. 3 Naresh Malhotra and S Dash (2009), . Marketing Research, 5th edition, Pearson Prentice Hall. 4. CR Kothari, Gupta Kapoor
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**Course Outcome**

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Learn the basics of Research and the process associated with it.	K3
CO <sub>2</sub>	Detect different methods of data collection and better interpretation.	K3
CO <sub>3</sub>	Attributes contributed through ICT tools in effective research.	K5
CO <sub>4</sub>	Learn the basic statistical Parameters and sampling	K3
CO <sub>5</sub>	Know about the testing of hypothesis	K4

K1= Remember, K2= Understand, K3 = Apply, K4= Analyze and K<sub>5</sub>= Synthesis

**Mapping of COs with PSOs & POs:**

	PO								PSO					Sum of COs with PSOs & POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
<b>CO1</b>	3	3	3	3	3	3	3	1	3		3	1	3	32
<b>CO2</b>	3	3	1	3	3	3	3		3		3	1	3	29
<b>CO3</b>	3	3	1	3	3	3	3		3		3		3	28
<b>CO4</b>	3	3	2	3	3	3	3		3	3	1	1	3	31
<b>CO5</b>	3	3	3	3	3	3	3	3	3		1		3	31
Grand total of COs with PSOs and POs													151	
<b>Grand Total of COs with PSOs and POs</b> Mean Value of COs with PSO and POs $= \frac{\text{Grand Total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = (151 / 56)$													2.7	

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.7
Observation	<b>COs of Research methodology and statistics related to a strong extent with PSOs and POS</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.**  
**DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY**

<b>Course Code &amp; Title</b>	<b>Technology of Meat and Poultry Laboratory (23UFSP55)</b>		
<b>Class</b>	<b>III-FST</b>	<b>Semester V</b>	<b>Hours – 60</b>
<b>Course Educational Objectives</b>	<p>The course aims to enable the students to</p> <ul style="list-style-type: none"> <li>• Know about the slaughter process of different meat.</li> <li>• Analyze about Chemical Characteristics and quality of meat.</li> <li>• Know the Processing of Ham, Bacon and Sausages.</li> <li>• Study the characteristics of Egg.</li> </ul>		
<b>S.No</b>	<b>Content</b>		
1.	Slaughtering of Meat (Sheep/Goat)		
2.	Slaughtering of Poultry (Chicken/Quail)		
3.	Estimation of moisture content of meat and Poultry.		
4.	Estimation of pH of fresh and spoiled meat.		
5.	Estimation of WHC of fresh and spoiled meat.		
6.	Estimation of ERV of fresh and spoiled meat.		
7.	Estimation of protein content of meat.		
8.	Canning of meat/meat product formulation.		
9.	Processing of Minced Meat.		
10.	Preparation of Ham and Bacon.		
11.	Processing of Meat Sausages.		
12.	To study the structure of an Egg.		
13.	To perform freezing of Egg yolk/albumen.		
14.	To study shelf-life of eggs by different methods of preservation.		
15.	Evaluation of egg quality (Market eggs and branded eggs).		
16.	Field Visit – Slaughter House		

**Course Outcome**

<b>SL.NO</b>	<b>COURSE OUTCOME (After completion of the course, students should be able to)</b>	<b>KNOWLEDGE LEVEL (Bloom's Taxonomy)</b>
<b>CO<sub>1</sub></b>	Know about the slaughter process of different meat.	<b>K3</b>
<b>CO<sub>2</sub></b>	To know about Chemical Characteristics of meat	<b>K4</b>
<b>CO<sub>3</sub></b>	To know about quality of meat	<b>K3</b>
<b>CO<sub>4</sub></b>	Know the Processing of Ham, Bacon and Sausages.	<b>K3</b>
<b>CO<sub>5</sub></b>	Study the characteristics of Egg.	<b>K5</b>

K1= Remember, K2= Understand, K3 = Apply, K4= Analyze and K<sub>5</sub>= Synthesis

**Mapping of COs with PSOs &POs:**

	PO								PSO					Sum of COs with PSOs &POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3			2	3	3		3		3	3		29
CO2	3	3			2	3	3		3		3	3		29
CO3	3	3			2	3	3		3	2	3	3		31
CO4	3	3			2	3	3		3		3	3		29
CO5	3	3			2	3	3		3		3	3		29
<b>Grand total of COs with PSOs and POs</b>													<b>147</b>	
<b>Grand Total of COs with PSOs and POs</b>													<b>3.59</b>	
<b>Mean Value of COs with PSO and POs</b>														
= _____ = (147/ 41)														
<b>Number of COs relating with PSOs and POs</b>														

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			3.59
Observation	<b>COs of Technology of Meat and Poultry Laboratory related to a strong extent with PSOs and POS</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.**  
**DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY**

<b>Course Code &amp; Title</b>		<b>Food Quality Testing and Evaluation (22UFSD35)</b>		
<b>Class</b>	<b>III-FST</b>	<b>Semester V</b>	<b>Hours - 90</b>	<b>Credit - 6</b>
<b>Course Educational Objectives</b>	<p>The course aims to enable the students to</p> <ul style="list-style-type: none"> <li>• Study about the various quality attributes, Appearance and taste of food.</li> <li>• Learn about the role of olfaction and Colour in the sensory acceptability of food.</li> <li>• Know about the concept of texture with respect to various food groups.</li> <li>• Know about the physical and chemical quality testing of food</li> <li>• Learn about microbial quality and shelf life testing of food.</li> </ul>			
<b>UNIT</b>	<b>Content</b>			<b>No. of Hours</b>
I	<p>Introduction to quality attributes – Physical, Chemical, sensory and microbial quality of food.</p> <p><b>Sensory attributes of Food</b></p> <p><b>Appearance</b> –Importance of Food Appearance, Physical requirements of appearance.</p> <p><b>Taste</b> – Introduction, Types, Mechanism of taste perception, factors affecting taste perception</p>			18
II	<p><b>Olfaction</b> – Mechanism of odour perception, Classification of odour, olfactory abnormalities, Sniffing method.</p> <p><b>Colour</b> – Functions of food colour, mechanism of colour perception, Reflectance Spectrophotometry and Colorimetry.</p>			18
III	<p><b>Texture</b> - Introduction, Definition and classification of texture profile, Measurement of texture in various food groups viz. cereals, dairy, fruits and vegetables, fish, meat and meat products</p> <p>Panel selection, Types of panel members, screening and training; types of sensory test – Difference and Descriptive tests.</p>			18
IV	<p><b>Physical Quality Testing:</b> Moisture content, Water Absorption Index, Water Solubility Index, Oil Absorption Index, Rehydration Ratio, Expansion Ratio, Cooking Time, Density, Viscosity.</p> <p><b>Chemical Quality Testing:</b> Macronutrients, Vitamins, Ash Content, Crude Fiber, Dietary Fiber, Tannins, Phytochemicals, Total Phenols, Antioxidant activity.</p>			18
V	<p><b>Microbial Quality Testing:</b> Bacteria, Fungi, Microbial analysis of specific food groups- cereal products, fruit and vegetable products,</p>			18

	beverages, meat and poultry. <b>Shelf Life Testing-</b> Components, Protocol Real time shelf life testing, Accelerated Shelf Life Testing, Retained Sample Shelf Life Testing, Cyclic Temperature Stress Testing, Stability Test Equipment.	
<b>Books for Reference</b>	1. Pomeranz.Y and Meloan, C.E.1996, Food Analysis: Theory and Practice, CBS Pulishers and Distributors, New Delhi.. 2. DeMan, 3rd edition, Principles of Food Chemistry, Springer, 2007. 3. Meilgard, Sensory Evaluation Techniques, 3rd ed. CRC Press LLC, 2010. 4. Srilakshmi.B (2018), Food Science, New Age International Publishers (India), 7 <sup>th</sup> edition. 5. John B. Hutchings, Food Colour& Appearance, 2 <sup>nd</sup> ed; Springer Publications, 2010.	

### Course Outcome

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Study about the various quality attributes, Appearance and taste of food.	K3
CO <sub>2</sub>	Learn about the role of olfaction and Colour in the sensory acceptability of food.	K4
CO <sub>3</sub>	Know about the concept of texture with respect to various food groups.	K3
CO <sub>4</sub>	Know about the physical and chemical quality testing of food	K3
CO <sub>5</sub>	Learn about microbial quality and shelf life testing of food.	K4

K1= Remember, K2= Understand, K3 = Apply, K4= Analyze and K<sub>5</sub>= Synthesis

### Mapping of Cos with PSOs & POs:

	PO								PSO					Sum of COs with PSOs & POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3			3	3			3	1		1	3	26
CO2	3	3			3	3			3			1	2	18
CO3	3	3			3	3	2		3	1			1	19
CO4	3	3			3	3		3	3			1	1	25
CO5	3	3			3	3		3	3	1			3	28
Grand total of COs with PSOs and POs													116	

<b>Grand Total of COs with PSOs and POs</b> <b>Mean Value of COs with PSO and POs</b> = ----- = <b>(116 / 39)</b> <b>Number of COs relating with PSOs and POs</b>	3.0
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Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			3.0
Observation	<b>COs of Food Quality Testing and Evaluation related to a strong extent with PSOs and POS</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.  
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY**

<b>Course Title</b>	<b>Food Quality Testing and Evaluation Laboratory</b>			
<b>Course Code</b>	<b>(22UFSP65)</b>			
<b>Class</b>	<b>III-FST</b>	<b>Semester V</b>	<b>Hours - 45</b>	<b>Credit - 2</b>
<b>S.No</b>	<b>Content</b>			
	<b>Food Quality Testing Laboratory</b>			
1.	Sensitivity tests for four basic tests.			
2.	Quality Evaluation of milk and detection of various flavour defects.			
3.	Subjective and objective evaluation of biscuit samples for textural properties.			
4.	Simple tests for detection of common adulterants – formaldehyde, starch, cane sugar, hydrogen peroxide, sodium bicarbonate in milk.			
5.	Estimation of Water Absorption Capacity and Water Solubility Index of cereal and pulse flour.			
6.	Estimation of the effect of acid, alkali, pressure and salt concentration on cooking time.			
7.	Extraction of pigments from fruits and vegetables and evaluation using Tintometer			
8.	Estimation of benzoic acid in beverages			
9.	Detection of residual sulphurdioxide in beverages			
10.	Development and sensory testing of a food product			
<b>Books for Reference</b>	1. Pomeranz and Cliffton, Food Analysis. Theory and Practice. I ed. CBS Publisher. New Delhi, 2002.			

**Course Outcome:**

<b>SL.NO</b>	<b>COURSE OUTCOME (After completion of the course, students should be able to)</b>	<b>KNOWLEDGE LEVEL (Bloom's Taxonomy)</b>
<b>CO<sub>1</sub></b>	Gain the knowledge about the different food evaluation techniques.	<b>K4</b>
<b>CO<sub>2</sub></b>	Recognize the process involved in sensory evaluation	<b>K3</b>
<b>CO<sub>3</sub></b>	Methods to find different adulterants present in food	<b>K4</b>
<b>CO<sub>4</sub></b>	Estimation of certain physical and chemical properties of food	<b>K3</b>
<b>CO<sub>5</sub></b>	Interpret the residual levels of adulterants in food	<b>K3</b>

K1= Remember, K2= Understand, K3 = Apply, K4= Analyze and K<sub>5</sub>= Synthesis

**Mapping of COs with PSOs &POs:**

	PO								PSO					Sum of COs with PSOs &POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
<b>CO1</b>	<b>3</b>	<b>3</b>			<b>3</b>	<b>3</b>			<b>3</b>	<b>2</b>		<b>1</b>	<b>3</b>	<b>27</b>
<b>CO2</b>	<b>3</b>	<b>3</b>			<b>3</b>	<b>3</b>			<b>3</b>			<b>2</b>	<b>2</b>	<b>19</b>
<b>CO3</b>	<b>3</b>	<b>3</b>			<b>3</b>	<b>3</b>	<b>2</b>		<b>3</b>	<b>2</b>			<b>1</b>	<b>20</b>
<b>CO4</b>	<b>3</b>	<b>3</b>			<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>			<b>2</b>	<b>2</b>	<b>24</b>
<b>CO5</b>	<b>3</b>	<b>3</b>			<b>3</b>	<b>3</b>		<b>3</b>	<b>3</b>	<b>2</b>			<b>3</b>	<b>23</b>
<b>Grand total of COs with PSOs and POs</b>													<b>113</b>	
<b>Grand Total of COs with PSOs and POs</b>													<b>2.8</b>	
<b>Mean Value of COs with PSO and POs</b> = _____ = <b>(113/ 40)</b>														
<b>Number of COs relating with PSOs and POs</b>														

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.8
Observation	<b>COs of Food Quality Testing and Evaluation related to a strong extent with PSOs and POS</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.**  
**DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY**

<b>Course Code &amp; Title</b>		<b>Food Quality Management (22UFSE15) (A)</b>		
<b>Class</b>		<b>III-FST</b>	<b>Semester - V</b>	<b>Hours - 60</b>   <b>Credits - 3</b>
<b>Course Educational Objectives</b>		<p>The course aims to enable the students to</p> <ul style="list-style-type: none"> <li>• Introduce the concept of Food Quality Management system</li> <li>• Learn about food contaminations</li> <li>• Create awareness on food additives</li> <li>• Know about the permissible limits according to government standards and their hazards</li> <li>• Study about Food Laws, Standards and Food regulations in national and international areas.</li> </ul>		
<b>UNIT</b>	<b>Content</b>			<b>No. of Hours</b>
I	<p><b>Food Quality:</b> Introduction to food quality management - Definition, quality concepts, quality perception, quality attributes, safety, health, sensory, shelf life, convenience, extrinsic attributes, factors affecting food quality. Total food quality management functions.</p>			12
II	<p><b>Food contamination:</b> Contamination in Food- : Physical, Natural toxins, chemical, heavy metals, antibiotics, dioxins, environmental pollutants. Contaminants formed during processing nitrosamines, acrylamide, contaminants from packaging materials.</p>			12
III	<p><b>Food Additives:</b> Meaning, Need, Classification, Characteristics and classification of food additives. Antimicrobial agents – Nitrites, sulphides, sulphur di oxide, sodium chloride, hydrogen peroxide. Antioxidants - Introduction, mechanism of action, natural and synthetic anti-oxidants, technological aspect of antioxidants. Sweeteners- Introduction, importance, classification- natural and artificial. Colors- Importance, classification- natural, artificial colors.</p>			14
IV	<p><b>Food standards:</b> GRAS (Generally Recognized as Safe). Permissible limit for Food additives. ADI, LD50. Food labelling. Technical Barriers in Trade, Tinned foods -Standards of Identity, Standards of Quality.</p>			10
V	<p><b>Food Laws and regulations:</b> International and National Food laws &amp; regulations: FSSAI, FPO, PFA, AGMARK, BIS, ISI, HACCP, USFDA, EU, Codex Alimentarius. World Trade Organization- Sanitary and Phyto Sanitary agreement.</p>			12
<b>Books for</b>	1. Manay, N. Shakuntala O. Food: facts and principles. New Age International,			

<b>Reference</b>	2001. 2. Shalton , Principles and Practices for the Safe processing of Foods. 2.Pieterneel A, Luning, Willem J. Marcelis, Food Quality Management Technological and Managerial principles and practices, Wageningen,2009. 3. Brannen and etal,Food Additives, Marcel Dekker, New York,1990 4. DeMan, 3rd edition, Principles of Food Chemistry, Springer, 2007. 5. Early, R. Guide to Quality Management Systems for the Food industry, Blackie, Academic and Professional, London, 1995.
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**Course Outcome:**

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom’s Taxonomy)
CO <sub>1</sub>	Learn the concepts in food quality management	K3
CO <sub>2</sub>	Detect and differentiate the existence of different types of food contaminations	K4
CO <sub>3</sub>	Describe the significance of food additives in varieties	K3
CO <sub>4</sub>	Gain depth knowledge about Food Standards, permissible limits and labelling of food products	K3
CO <sub>5</sub>	Identification of available national and international food laws and regulations	K4

K1= Remember, K2= Understand, K3 = Apply, K4= Analyze and K5= Synthesis

**Mapping of COs with PSOs & POs:**

	PO								PSO					Sum of COs with PSOs & POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3			3		3		3		2	1		18
CO2	3	3			3	2	3		3		2	2	1	22
CO3	3	3			3		3		3		2	2	3	22
CO4	3	3	3	2	3	3	3	3	3		3		3	32
CO5	3	3	3	2	3	3	3		3		2		3	28
Grand total of COs with PSOs and POs													122	
<b>Grand Total of COs with PSOs and POs</b> <b>Mean Value of COs with PSO and POs</b> = ----- =(122/45) <b>Number of COs relating with PSOs and POs</b>													2.7	

Strong – 3, Medium – 2, Low - 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.7
Observation	<b>COs of Food Quality Management related strongly with PSOs and POS</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.  
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY**

<b>Course Code &amp; Title</b>		<b>FOOD LAWS AND REGULATIONS (22UFSE15) (B)</b>		
<b>Class</b>		<b>III-FST</b>	<b>Semester - V</b>	<b>Hours - 60</b>
<b>Course Educational Objectives</b>		<p>The course aims to enable the students to</p> <ul style="list-style-type: none"> <li>• To study about the laws involved in maintaining the standards of the food.</li> <li>• To learn about the National Laws.</li> <li>• To get awareness regarding International Laws and certification marks for different products.</li> <li>• To know about the Packing and labelling requirements.</li> <li>• To study the testing and evaluation pattern of raw and processed foods.</li> </ul>		
<b>UNIT</b>	<b>Content</b>			<b>No. of Hours</b>
I	<p><b>Introduction to Laws and Regulations</b> Objective of Food Laws, Major Food Laws and Regulations of India and Regulation of Food Sanitation.</p> <p><b>Food Quality Assurance Systems</b> Quality management systems in India; various organizations dealing with inspection, traceability and authentication, certification and quality assurance, labelling issues.</p>			12
II	<p><b>National laws</b> Prevention of food Adulteration Act (PFA), Fruit Product Order (FPO), Meat Product Order (MPO), Agmark, Bureau of Indian Standards (BIS), . Food Safety and Standards (FSS) Act, 2006, FSS Rules and Regulations, 2011.</p>			12
III	<p><b>International Laws</b> Sugar (Control), Order, Export (Quality Control &amp; Inspection) Act, 1963 and Rules, Bureau of Indian Standards, International Food Control Systems including CODEX. HACCP; quality manuals, documentation and audits; laboratory quality procedures, IPR and patent., ISO, Codex Alimentarius, FDA, USDA, CARE. International quality management systems.</p>			12
IV	<p><b>Laws affecting Food Labeling and Packaging in Food Industry</b> Packaging – Functions, Classifications, Material used for packing and laws related to packaging. Labeling – Nutrition Labeling, Labeling provisions in existing food laws.</p>			12

	Research Institutes and Organizations related to Food	
V	<b>Testing and Evaluation</b> Testing and evaluation of quality attributes of raw and processed foods; Detection and estimation of food additives and adulterants; quality assurance procedure, preparation of documentation & records, visit to units with ISO systems; visit to units with HACCP certification.	12
<b>Books for Reference</b>	1. B. Srilakshmi, Food Science, New Age Publishers, 2002. 2. Potter, Food Science, Springer International Publishing AG.	

**Course Outcome:**

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Elucidation of various food laws and regulations.	K2
CO <sub>2</sub>	Identification of about various food laws in India.	K2
CO <sub>3</sub>	Interpretation of various International laws.	K2
CO <sub>4</sub>	Get in depth knowledge about food labelling and packing requirements	K2
CO <sub>5</sub>	Outlining of testing and evaluation pattern of raw and processed foods.	K1

K1= Remember, K2= Understand, K3 = Apply, K4= Analyze and K<sub>5</sub>= Synthesis

**Mapping of COs with PSOs & POs:**

	PO								PSO					Sum of COs with PSOs & POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1			1		1	1		1					2	6
CO2				1	2			1			1		3	8
CO3				2	1		1	1			1		3	9
CO4				1	2			1			1		3	8
CO5	1		3		1			1	1	1	1		2	11
Grand total of COs with PSOs and POs													42	
Grand Total of COs with PSOs and POs													1.44	
Mean Value of COs with PSO and POs = -----=(42/29)														
Number of COs relating with PSOs and POs														

Strong – 3, Medium 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.44	
Observation	<b>COs of Food Laws and Regulations related to a medium extent with PSOs and PO<sub>s</sub></b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.  
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

<b>Course Code &amp; Title</b>		<b>FOOD SAFETY (22UFSSL5)</b>	
<b>Class</b>		III-FST	<b>Semester</b> V
<b>Course Educational Objectives</b>		<ul style="list-style-type: none"> <li>• To study about the importance of Food Safety.</li> <li>• To learn about the Food Hazards and its effect.</li> <li>• To get awareness regarding different Food additives and adulterants.</li> <li>• To know about the methods of Hazard Management.</li> <li>• To study about recent trends in Food Storage and Preservation..</li> </ul>	
<b>UNIT</b>	<b>Content</b>		
I	<b>Food Safety:</b> Introduction and Definition, Factors affecting Food Safety. Importance of Safe Foods.		
II	<b>Food Hazards-</b> Definition and Types of Food Hazards- Physical, Chemical and Biological. Impact on health. Control measures.		
III	<b>Food Additives:</b> Colours - types, sources – natural and synthetic, uses. Preservatives - organic and chemical. <b>Food Adulteration:</b> Food adulteration - definition, adulterants types and identification of food adulterants.		
IV	<b>Management of Hazards:</b> Need, Hygiene and Sanitation in Food Service Establishments -Sources of contamination. Personal Hygiene.Food Safety Measures.		
V	<b>Food Storage, preservation and safety:</b> Preservation process and food storage. Recent developments in food safety- RTE, RTS, food storage and food preservation aspects.		
<b>Books for Reference</b>	1. Marriott, Norman G. Principles of Food Sanitation, 5 <sup>th</sup> ed., AVI, New York, 2006. 2. William Helferich, Carl K. Winter, Food Toxicology, CRC Publications, 2010.		

**Course Outcome** After completion of the course, students should be able to do

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Elucidation of Food Safety measures and importance.	K2
CO <sub>2</sub>	Learn and Interpret about the basics of food Hazards.	K2

CO <sub>3</sub>	Identify different food additives and adulterants present in food.	K2
CO <sub>4</sub>	Apply knowledge about Safety and Hygiene Measures in food industry.	K2
CO <sub>5</sub>	Detect the recent outbreaks in food safety and food preservation.	K3

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K<sub>5</sub>= Synthesis

**Mapping of Cos with PSOs & POs:**

	PO								PSO					Sum of COs with PSOs & POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1														
CO2			2			1				1	2	1		7
CO3					1		1							2
CO4	1		1		1						1			4
CO5								1						1
Grand total of COs with PSOs and POs													14	
<b>Grand Total of COs with PSOs and POs</b> <b>Mean Value of COs with PSO and POs</b> = $\frac{\text{Grand Total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}}$ = (14 / 12)													1.16	

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.16	
Observation	COs of Food Safety related to a medium extent with PSOs and POS		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.**

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code & Title		Technology of Sea Foods (22UFSD46)			
Class	III-FST	Semester	VI	Hours: 90	Credit- 6
Course Educational Objectives	The course aims to enable the students to <ul style="list-style-type: none"> <li>• Learn about sea foods and its characteristics.</li> <li>• Learn about handling processing of sea foods.</li> <li>• Study about Sea foods preservation methods</li> <li>• Gain insight about different fishery by products</li> <li>• Understand the processing of other sea foods</li> </ul>				
UNIT	Content				No. of Hours
I	<b>Sea Foods:</b> Introduction, Types of Sea Foods. Fish- Classification, Composition and Nutritional value. Characteristics of various Fish – Fresh water fish, Brackish Water Fish and Marine Fish, Selection parameters of fresh fish (Fin Fish & Shell Fish). Quality Control Inspection of Sea food Industry. Wild and Farm Varieties- Consequences of feed, Production data Health Benefits.				18
II	<b>Processing of Fish:</b> Handling: Handling of fish at harvest/ Onboard, Postharvest handling on Land; Handling during preprocessing and Processing –Stunning of Fish, Grading, Removal of Slime, Scaling, Washing, Deheading, Gutting, Cutting away the Fins, Slicing, Filleting, Skinning, Meat bone Separation.				18
III	<b>Processing and Preservation of Fish:</b> Chilling and Freezing :Storage of Sea Foods: Chilled Storage- Iced Storage, Chilled Seawater Storage (CSW), Chilled Freshwater Storage (CFW), Mechanically Refrigerated seawater Storage (RSW) and Cold air Storage. Freezing – Quick and Slow Freezing. Curing Process- Drying- Sun drying, solar drying, Mechanical driers; Dry Curing, wet Curing; Smoking of Fish; Salting – Dry and Wet Salting of Fish. Canning of fish- Definition, Principles, Processing and storage of canned fish.				18
IV	<b>Fishery by-products:</b> Surimi- Introduction, fish muscle proteins, the surimi production process; Fish eggs (caviar), Fish Protein Concentrates (FPC), Fish Protein Extracts (FPE), Fish Protein Hydrolysate (FPH), Vitamin E, fish Oil extraction <b>Value added Fisheries Products</b> – Fish Sausages, Fish fillets, fish cutlets, dehydrated fish products, Fish Pickles, Fish Paste, Fish Flakes/wafers and Fish Noodles.				18

V	<b>Processing of other Sea foods</b> - Crabs, lobsters, prawns, shrimps & squid. Packaging – Suitable packaging for Sea foods and its products. (LDPE, HDPE, vacuum packaging, MAP, bottling and canning).	18
<b>Book for Study</b>	1. Sen DP, Advances in Fish Processing Technology, Allied Publishers Pvt. Limited 2005. 2. Hall GM, Fish Processing Technology, VCH Publishers Inc., NY, 1992.	
<b>Books for Reference</b>	1. Shahidi F and Botta JR, Seafoods: Chemistry, Processing, Technology and Quality, Blackie Academic & Professional, London, 1994. *fao.org -FAO Fisheries Circular No. 905. FIU/C905 (Processing of Fish)	
<b>Web Reference</b>	<a href="https://www.cold.org.gr">https://www.cold.org.gr</a> <a href="https://www.routledge.com">https://www.routledge.com</a> <a href="https://www.wiley.com">https://www.wiley.com</a>	

### Course Outcome

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Explain the classification, characteristic and the Quality Control Inspection of Sea food Industry.	K3
CO <sub>2</sub>	Apply the various handling processing of sea foods	K3
CO <sub>3</sub>	Determine about Sea foods preservation methods	K3
CO <sub>4</sub>	Attributes to know about the insight of different fishery products.	K2
CO <sub>5</sub>	Provides an in-depth knowledge on the processing of other sea foods	K4

### Mapping of COs with PSOs & POs:

	PO								PSO					Sum of COs with PSOs & POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3	2	3	3	3	3		3	3	3	3	3	35
CO2	3	3	2	3	3	3	3		3	3	1	3	3	33
CO3	3	3	2	3	3	3	3	3	3	2	1	3	3	35
CO4	3	3			3	3		3	3	3	3	3	3	30

<b>CO5</b>	3	3	2	1	3	3	3	3	3	3	1	3		31
Grand total of COs with PSOs and POs														164
<b>Grand Total of COs with PSOs and POs</b>														2.8
<b>Mean Value of COs with PSO and POs</b> = ----- <b>=(164/59)</b>														
<b>Number of COs relating with PSOs and POs</b>														

Strong – 3, medium – 2, Low - 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.8
Observation	<b>COs of Technology of Sea Foods related to a strongly extent with PSOs and POS</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.**  
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

<b>Course Title</b>	<b>Technology of Sea Foods Laboratory</b>			
<b>Course Code</b>	<b>(22UFSP76)</b>			
<b>Class</b>	<b>III-FST</b>	<b>Semester VI</b>	<b>Hours -45</b>	<b>Credit - 2</b>
<b>Course Educational Objectives</b>	<p>The course aims to enable the students to</p> <ul style="list-style-type: none"> <li>• Identify various types of fishes</li> <li>• Study about cutting of fin fish and shell fish</li> <li>• Evaluate the quality of seafood.</li> <li>• Know the processing of canning</li> <li>• Can formulate fish products</li> </ul>			
<b>S.No</b>	<b>Content</b>			
1.	Identification of different types of Fish			
2.	Cutting process of Fish			
3.	Types of Fish Cutting Methods			
4.	Cutting process of Prawn			
5.	Cutting Process of Crab			
6.	Cutting Process of Shrimp			
7.	Cutting process of Squid			
8.	Evaluation of the quality fresh fish.			
9.	Canning of Fish			
10.	Cut out examination of canned fish - (i) Sardine, (ii) Tuna			
11.	Fish product formulation- Fish Pickle			
12.	Preparation of Fish Paste			
13.	Field Visit			

**Course Outcome**

<b>SL.NO</b>	<b>COURSE OUTCOME (After completion of the course, students should be able to)</b>	<b>KNOWLEDGE LEVEL (Bloom's Taxonomy)</b>
<b>CO<sub>1</sub></b>	Gain the knowledge in types of sea foods	<b>K3</b>
<b>CO<sub>2</sub></b>	Recognize the types and difference between each sea food	<b>K5</b>
<b>CO<sub>3</sub></b>	To understand the processing of various sea foods	<b>K3</b>
<b>CO<sub>4</sub></b>	To analyse the quality of sea foods	<b>K3</b>
<b>CO<sub>5</sub></b>	To know about various sea food products	<b>K5</b>

K1= Remember, K2= Understand, K3 = Apply, K4= Analyze, K5= Evaluate.

**Mapping of COs with PSOs &POs:**

	PO								PSO					Sum of COs with PSOs &POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3		3	3	3	1	1	3	3	3	3		29
CO2	3	3	3	3	3	3			3	2		3		26
CO3	3	3	3	3	3		3	3	3	1		3		28
CO4	3	3	3	3	3		3	3	3	3		3		30
CO5	3	3		3	3	3	3	3	3	3	3	3	3	36
<b>Grand total of COs with PSOs and POs</b>														<b>149</b>
<b>Grand Total of COs with PSOs and POs</b>														<b>2.9</b>
Mean Value of COs with PSO and POs $= \frac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = (149/52)$														

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.9
Observation	<b>COs of Technology of Sea Foods Laboratory related to a strongly extent with PSOs and POS</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.**

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

<b>Course Code &amp; Title</b>	<b>Project Management and Entrepreneurship (22UFSD56)</b>			
<b>Class</b>	<b>III-FST</b>	<b>Semester VI</b>	<b>Hours- 75</b>	<b>Credit - 5</b>
<b>Course Educational Objectives</b>	<p>The course aims to enable the students to</p> <ul style="list-style-type: none"> <li>• Learn about entrepreneurship and women entrepreneurship</li> <li>• Study about the small business and Forms of Business Organization</li> <li>• Interpret about the Project Identification, Screening and Appraisal</li> <li>• Know about the importance of various financial institutions and banks in supporting entrepreneurs.</li> <li>• Understand about the project management and global business</li> </ul>			
<b>UNIT</b>	<b>Content</b>			<b>No. of Hours</b>
I	<p><b>Entrepreneurship:</b> Concept and Definition. The Conceptual model of Entrepreneurship given by John Kao. Views given by Schumpeter Walker &amp; Drucker on Entrepreneurship, Types of Entrepreneurships.</p> <p><b>Women Entrepreneurship</b> - Definition, Features, Categories, Entrepreneurial traits for Women Entrepreneurs, Factors influencing Women Entrepreneurship, Barriers, Funding agencies and schemes.</p>			15
II	<p><b>Small Scale Business and Forms of Business Organization:</b></p> <p>Small Business: Definition, Composition and Economic Contribution. Large, Medium and Small Scale Enterprises.</p> <p>Forms of Ownership: Sole Proprietorship, Partnership &amp; Corporation form of Organization -Advantages and Disadvantages.</p>			15
III	<p><b>Project Appraisal:</b></p> <p>Project - definition, features, types, Project Identification, Project Proposal, Project screening, Feasibility study.</p> <p>Project Appraisal - technical appraisal, marketing appraisal, legal and environment appraisal, financial appraisal- evaluating project using pay-back and NPV, Detailed project report.</p>			15
IV	<p><b>Industrial Finance:</b></p> <p>Cost benefit analysis, Resource Considerations in a Project. Arrangement of funds: Traditional sources of financing – Equity shares, preference shares, Debentures/bonds, loan from financial</p>			15

	institutions- Venture capital / Incubation fund. Role played by various Financial Institutions like NABARD, IDBI, SIDBI and Commercial Banks.	
V	<b>Project Management:</b> Project Management process, role of a Project Manager, Organizational and Behavioural Issues in project management. Global tender and Project insurance. Global Business: Branches, Licensing Arrangements, Subsidiaries, Franchising, Joint venture and turnkey projects.	15
<b>Books for Reference</b>	1. Scarborough & Zimmerer, Effective Small Business Management, 2008, CBS Publishers, New Delhi 2. Gupta & Srinivasan, Entrepreneurial Development, 2004, CRC Press LLP, Mumbai. 3. P. Gopalkrishnan & V.E. Ramamoorthy, Text book of Project management, 2000, VCH Publishers, NY. 4. B.M. Patel, Project management, 2000, Vikas Publishers, New Delhi.	

### Course Outcome

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Explain the entire concept of entrepreneurship	K3
CO <sub>2</sub>	Analyse about small business and forms of business organization	K3
CO <sub>3</sub>	Detect and determine the detailed structure of projects and its appraisals	K4
CO <sub>4</sub>	Recognize an in-depth knowledge on roles of different agencies in industrial financing	K2
CO <sub>5</sub>	Knows about project management for sustained local to global business	K2

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K<sub>5</sub>= Synthesis

**Mapping of COs with PSOs & POs:**

	PO								PSO					Sum of COs with PSOs & POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
<b>CO1</b>	3	3		1	3	3			3			3		19
<b>CO2</b>	3	3			3	3	2		3		2	3		22
<b>CO3</b>	3	3	3	2	3	3			3	2			3	25
<b>CO4</b>	3	3	3		3	3			3		2		2	22
<b>CO5</b>	3	3	1	2	3	3		2	3	1	2		2	25
Grand total of COs with PSOs and POs													113	
<b>Grand Total of COs with PSOs and POs</b> <b>Mean Value of COs with PSO and POs</b> = -----=(113/43) <b>Number of COs relating with PSOs and POs</b>													2.6	

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.6
Observation	<b>COs of Project Management and Entrepreneurship related to a strongly extent with PSOs and POS</b>		

<b>Course Code &amp; Title</b>	<b>Food Beverage Technology</b>		
<b>Class</b>	<b>III-FST</b>	<b>Semester</b>	<b>VI</b>
<b>Course Educational Objectives</b>	<p>The course aims to enable the students to</p> <ul style="list-style-type: none"> <li>• Introduce the concept of beverage manufacturing</li> <li>• Learn about different plant-based beverages</li> <li>• Create awareness on composition of beverages</li> <li>• Know about the process and preservation of Acholic beverages</li> <li>• Study about packed beverages</li> </ul>		
<b>UNIT</b>	<b>Content</b>		<b>No. of Hours</b>
I	<p><b>Introduction to beverages:</b> Types of beverages and their importance, status of beverage industry in India, Manufacturing technology for juice-based beverages, synthetic beverages; technology of still, carbonated, low-calorie and dry beverages, isotonic and sports drinks; role of various ingredients of soft drinks, carbonation of soft drinks.</p>		12
II	<p><b>Manufacturing process of beverages:</b> Beverages based on tea, coffee, cocoa, spices, plant extracts, herbs, nuts, Dairy-based beverages.</p>		12
III	<p><b>Traditional and Farm based beverages:</b> Chemical composition and processing of Panakam, Jigarthanda, Lassi, Sherbet, Toddy, Buttermilk, Gruel, Thandai, Chhaang, Apong and Masala Chai.</p>		14
IV	<p><b>Alcoholic beverages:</b> Manufacture and quality evaluation; the role of yeast in beer and other alcoholic beverages, ale type beer, lager type beer, technology of brewing process, equipment used for brewing and distillation, wine and related beverages, distilled spirits.</p>		10
V	<p><b>Packaged drinking water:</b> Definition, types, manufacturing processes, quality evaluation and raw and processed water, methods of water treatment, BIS quality standards of bottled water; mineral water, natural spring water.</p>		12
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Manay, N.S, Shandaksharaswamy, M., (2004), "Foods- Facts and Principles", New Age International Publishers, New Delhi,</li> <li>2. Potter, N.N, Hotchkiss, J.H. (2000), "Food Science". CBS Publishers, New Delhi.</li> <li>3. Srilakshmi, B. Food Science (3rd Edition) (2003), New Age International (p) Limited Publishers, New Delhi,</li> <li>4. Nicholas Dege. (2011), "Technology of Bottled water". Blackwell publishing Ltd, UK.</li> </ol>		

**Course Outcome:**

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Learn the concepts in Beverage manufacturing.	K3
CO <sub>2</sub>	Interpretation the quality of plant-based beverages.	K4
CO <sub>3</sub>	Describe the significance beverage quality.	K3
CO <sub>4</sub>	Gain depth knowledge about Alcoholic beverage preparation and limits.	K3
CO <sub>5</sub>	Outline the quality attributes associated with packaged water	K4

K1= Remember, K2= Understand, K3 = Apply, K4= Analyze and K<sub>5</sub>= Synthesis

**Mapping of COs with PSOs & POs:**

	PO								PSO					Sum of COs with PSOs & POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3		2	3	1	3	2	3			3	2	25
CO2	3	3		1	3	3	3	1	3	3		1	1	25
CO3	3	3			3	3	3		3		1	1	2	22
CO4	3	3		1	3	3	3	2	3		1	2	2	26
CO5	3	3		1	3	1	3		3	3		2	2	24
Grand total of COs with PSOs and POs													122	
<b>Grand Total of COs with PSOs and POs</b> <b>Mean Value of COs with PSO and POs</b> = ----- = (122/51) <b>Number of COs relating with PSOs and POs</b>													2.4	

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.4
Observation	<b>COs of Food Beverage Technology related to a strongly extent with PSOs and POS</b>		

<b>Course Title</b>	<b>Food Beverage Technology Laboratory</b>		
<b>Course Code</b>			
<b>Class</b>	III-FST	<b>Semester</b>	VI
<b>S.No</b>	<b>Content</b>		<b>No. of Hours</b> 60
1.	Preparation of Squash.		
2.	Preparation of Juices.		
3.	Preparation of wine from grapes.		
4.	Quality analysis of prepared yogurt.		
5.	Preparation of apple cider vinegar.		
6.	Preparation of pickled cucumber / green pepper.		
7.	Preparation of probiotic drinks.		
8.	Preparation of Malt Beverages.		
9.	Preparation of Gruel		
10.	Visit to Beverage Industry.		

<b>SL.NO</b>	<b>COURSE OUTCOME (After completion of the course, students should be able to)</b>	<b>KNOWLEDGE LEVEL (Bloom's Taxonomy)</b>
<b>CO<sub>1</sub></b>	To learn about the processing of soft drinks	<b>K2</b>
<b>CO<sub>2</sub></b>	To know the processing of fermented beverages	<b>K3</b>
<b>CO<sub>3</sub></b>	To know the principle behind probiotics	<b>K2</b>
<b>CO<sub>4</sub></b>	To understand the processing of traditional beverages	<b>K4</b>
<b>CO<sub>5</sub></b>	Knowledge on processing and technology of beverages	<b>K2</b>

**Mapping of COs with PSOs & POs:**

	<b>PO</b>								<b>PSO</b>					<b>Sum of COs with PSOs &amp; POs</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	
<b>CO1</b>	3	3	2		3	3	1		3		1	3	2	<b>24</b>
<b>CO2</b>	3	3		3	3		2	3	3		1	3	3	<b>27</b>
<b>CO3</b>	3	3	2	2	3		3	3	3	2	2	3	2	<b>31</b>
<b>CO4</b>	3	3		3	3	3	3		3	2	3	3	2	<b>31</b>

<b>CO5</b>	<b>3</b>	<b>3</b>		<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>25</b>
Grand total of COs with PSOs and POs														<b>138</b>
<b>Grand Total of COs with PSOs and POs</b>														<b>2.5</b>
<b>Mean Value of COs with PSO and POs</b> = ----- = (138/ 55) <b>Number of COs relating with PSOs and POs</b>														

Strong – 3, Medium – 2 & Low - 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.5
Observation	<b>COs of Food Beverage Technology related to a strongly extent with PSOs and POS</b>		

Course Code & Title		FOOD PRODUCT DEVELOPMENT AND MARKETING (22UFSE26)		
Class	III-FST	Semester V	Hours -60	Credit - 3
<b>Course Educational Objectives</b>	<ul style="list-style-type: none"> <li>• To understand various aspects of development of a food product</li> <li>• To acquire knowledge on the importance of Consumer Research, Finance and Communication</li> <li>• To understand different marketing strategies for food product</li> <li>• To develop and justify technical specifications for the new product</li> <li>• Enumerate about the role of advertisements and technologies in marketing</li> </ul>			
UNIT	Content			Hours
I	<b>Food Products development-</b> Definition, Classification, characterization, Phases in food product development, Factors influencing new product development –social concerns, health concerns, impact of technology and Consumer acceptance of food product development.			<b>12</b>
II	<b>New Product Ideas:</b> Internal sources of idea, External sources of ideas. Screening of the ideas: Team approach and involvement of various departments, objectives of screening, criteria for screening ideas. Sensory Evaluation: Definition, sensory characteristics of food, Types of tests - Descriptive, threshold and acceptance test.			<b>12</b>
III	<b>Marketing of food product:</b> Definition, Historical phases of food marketing, Functions of food marketing, components of food marketing. and The Food pipeline. Marketing strategies: Introduction, Methods of marketing, Advantages and Disadvantages of marketing methods. Trends in food market.			<b>12</b>
IV	<b>Test Marketing:</b> Market Testing-Where, When, How, What to market. Evaluating results and analyzing, Failures in the Market place. Entrepreneurship: Plant location, investment, financing the project.			<b>12</b>
V	<b>Advertisement and Sales Promoters:</b> Role of advertisements and technologies in promotion of new products. Market promotion and positioning of food products.			<b>12</b>
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Vandevan. (1998). <i>Marketing Research Management</i>. CRC Press.Kolkata.</li> <li>2. Graf, E., &amp; Saguy, I. S. (1991). <i>Food Product Development: From Concept to the Market Place</i>. Van Nostrand Reinhold.</li> <li>3. Schaffner, D. J. (1997). <i>Food Marketing Management: An International Perspective</i>. Macgraw-Hills College.</li> </ol>			

<b>Books for Study</b>	1. Fuller, G. W. (1994). <i>New Food Product Development: From Concept to Marketplace</i> . CRC Press: New York. Gould, W. A. (1991). <i>Research and Development Guidelines for the Food Industry</i> . CTI Pub: Baltimore.
<b>Web reference</b>	<a href="https://www.tandfonline.com">https://www.tandfonline.com</a> <a href="https://www.ajol.info">https://www.ajol.info</a>

### Course Outcome

After completion of the course, students should be able to do

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Determines the Concept of New food products Development.	K2
CO <sub>2</sub>	Analyze the importance of new product ideas and Sensory Evaluation.	K1
CO <sub>3</sub>	Detect the main features and trends of a specific food product within an appropriate Marketing strategies.	K1
CO <sub>4</sub>	Develop the skills on Marketing and Entrepreneurship	K4
CO <sub>5</sub>	Determine the role of advertisements and technologies in marketing	K3

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K<sub>5</sub>= Synthesis

### Mapping of COs with PSOs &POs:

	PO								PSO					Sum of COs with PSOs &POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
CO1	3	3		3	3	3	1	1	3	3	3	3		29
CO2	3	3	3	3	3	3			3	2		3		26
CO3	3	3	3	3	3		3	3	3	1		3		28
CO4	3	3	3	3	3		3	3	3	3		3		30
CO5	3	3		3	3	3	3	3	3	3	3	3	3	36
Grand total of COs with PSOs and POs													149	
Grand Total of COs with PSOs and POs													2.9	
Mean Value of COs with PSO and POs = $\frac{\text{Grand Total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}}$ = (149/ 52)														

Strong – 3, Medium – 2 & Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.9
Observation	<b>COs of Food Product Development and Marketing related to a strongly extent with PSOs and POS</b>		

Course Code & Title		Food Packaging and Labelling (22UFSE26)			
Class	III-FST	Semester	VI	Hours-60	Credit-3
Course Educational Objectives	<ul style="list-style-type: none"> <li>Gain knowledge about concept of packaging and Package design.</li> <li>To study about packaging methods and system</li> <li>Understand packaging of different food products</li> <li>To study about labelling with the requirements of FSSAI</li> </ul> Attain insight into the aspects of labelling, testing and evaluation of packaged foods.				
UNIT	Content				No. of Hours
I	<b>Concept of Packaging and package design</b> Introduction and History of Packaging, Principles and Functions of Packaging. Evaluation Packaging Operations, Packaging Terminology Design of Packages, Package Design Requirements.				12
II	<b>Packaging Methods and Systems</b> Types of packaging: Components of packages, traditional food packaging and Modern methods of food packaging. Packaging Equipment – Filling, Cartoning, Conveyors, Sealing, Coding and Marking				12
III	<b>Packaging of Food Products</b> Bakery Products, Dairy Products, Fats and Oils, Fresh Foods, Beverages, Processed Foods Meat and Sea Foods				10
IV	<b>Testing of food Packaging:</b> Introduction, Types of testing of packaging materials – Physical, Chemical and mechanical properties. Moisture Sorption properties of foods and selection of packaging materials. Interaction between packaging and foods. Packaging laws and regulation.				13
V	<b>Labelling</b> – Definition, General requirements, Types, Materials, Adhesives Barcode and Universal Product code. Restriction of labelling. Food and Nutritional Labelling- Packaging and labeling Regulations and Specifications - FSSAI International Food Package Related to Food Safety, Quality and Trade.				13
<b>Books for Reference</b>	1. Potter, N. M. (2015). <i>Food Science</i> . West Post, CT: The AVI Publishing Company, Inc. USA. 2. Daise, F. A. (Ed.). (2015). <i>Modern Processing, Packaging and Distribution System for Food</i> . Glasgow and London: Blackie.				
<b>Books for study</b>	1. NIIR Board of Consultants and Engineers. (2013). <i>Food Packaging Technology Handbook</i> . National Institute of Research. New Delhi. 2. Pomeranz Y and Melon CE (1996), <i>Food Analysis: Theory and Practice</i> , CBS Publishers and Distributors, New Delhi.				

<b>Web reference</b>	<a href="http://www.healthfinder.gov">www.healthfinder.gov</a>	
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**Course Outcome**

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO <sub>1</sub>	Explain the Concept of Packaging in food	K2
CO <sub>2</sub>	Analysis of the Packaging methods used	K3
CO <sub>3</sub>	Explain about the different types of Food Products with suitable Packaging material	K2
CO <sub>4</sub>	Find out the different testing of food packaging	K3
CO <sub>5</sub>	Determines the importance of Labelling with FSSAI rules and regulations	K3

K1= Remember, K2= Understand, K3 = Apply, K4= Analyze and K<sub>5</sub>= Synthesis

**Mapping of Cos with PSOs & POs:**

	PO								PSO					Sum of COs with PSOs & POs	
	1	2	3	4	5	6	7	8	1	2	3	4	5		
CO1	1			1											2
CO2				2			2				1		1		6
CO3	1		1	2		2	3		1		1		1		12
CO4		3		3	1	2			1	2	2	2	1		17
CO5	1		1		1			3			1				7
Grand total of COs with PSOs and POs														44	
<b>Grand Total of COs with PSOs and POs</b> <b>Mean Value of COs with PSO and POs</b> = $\frac{44}{28} = (44/28)$ <b>Number of COs relating with PSOs and POs</b>															

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.57	
Observation	COs of Food Packaging and Labelling related to a medium extent with PSOs and POS		

<b>Course Code &amp; Title</b>	<b>Food Processing (19UFSSL6)</b>			
<b>Class</b>	<b>III-FST</b>	<b>Semester VI</b>	<b>Hours - Nil</b>	<b>Credit - 3</b>
<b>Course Educational Objectives</b>	<ul style="list-style-type: none"> <li>• To study about processing techniques used in various types of food.</li> <li>• To know about preparation of various products through processing.</li> <li>• To gain an understanding about importance of processing various food groups.</li> <li>• To provide positive outcomes from new processing technologies.</li> <li>• To find better method for processing different food by reducing the characteristic losses.</li> </ul>			
<b>UNIT</b>	<b>Content</b>			
I	<b>Principles in processing</b> Principles underlying food processing operations – Thermal, radiation, Refrigeration, Freezing and dehydration			
II	<b>Cereals &amp; Pulses Processing</b> Rice milling, Parboiling, Conventional Process, Wheat milling, Maize processing, Pulses milling, Oil extraction.			
III	<b>Meat &amp; fish processing</b> Ageing, Curing and Tenderization of meat, Pickling, Salting and Drying, Canning, Chilling, Freezing, Smoking.			
IV	<b>Dairy Processing</b> Milk Processing - Curd, Butter, Ghee, Cheese, Paneer and Ice cream.			
V	<b>Beverages Processing</b> Processing of Coffee, Types of Tea, Processing of cocoa and chocolate, vegetable juices, Carbonated Non Alcoholic Beverages and Alcoholic Beverages.			
<b>Books for Reference</b>	1. B. Srilakshmi, Food science, New Age Publishers, 2002. 2. Thangam.E.Philip, Modern Cookery, OrientBlackSwan, Sixth edition (2010).			

### Course Outcome

After completion of the course, students should be able to do

<b>SL.NO</b>	<b>COURSE OUTCOME</b>	<b>KNOWLEDGE LEVEL (Bloom's Taxonomy)</b>
<b>CO<sub>1</sub></b>	Explain about the basic processing principles.	<b>K2</b>
<b>CO<sub>2</sub></b>	Determine cereals and pulses processing.	<b>K2</b>
<b>CO<sub>3</sub></b>	Outline the techniques involved in processing of meat and fish.	<b>K3</b>

<b>CO<sub>4</sub></b>	Get in depth knowledge on processing of milk and milk products.	<b>K2</b>
<b>CO<sub>5</sub></b>	Know various processing techniques of beverage preparation.	<b>K2</b>

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K<sub>5</sub>= Synthesis

**Mapping of Cos with PS s & POs:**

	PO								PSO					Sum of COs with PSOs & POs
	1	2	3	4	5	6	7	8	1	2	3	4	5	
<b>CO1</b>	3	3		2	3	1	3	2	3			3	2	25
<b>CO2</b>	3	3		1	3	3	3	1	3	3		1	1	25
<b>CO3</b>	3	3			3	3	3		3		1	1	2	22
<b>CO4</b>	3	3		1	3	3	3	2	3		1	2	2	26
<b>CO5</b>	3	3		1	3	1	3		3	3		2	2	24
Grand total of COs with PSOs and POs													122	
<b>Grand Total of COs with PSOs and POs</b> <b>Mean Value of COs with PSO and POs</b> =-----=(122/51) <b>Number of COs relating with PSOs and POs</b>													2.4	

Strong –3, Medium–2 &Low–1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.4
Observation	<b>COs of Food Processing related to a strongly extent with PSOs and POS</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**B.Sc., Food Science and Technology**

**(Under Choice-Based Credit System from the Academic year 2023-24 onwards)**

<b>I SEMESTER</b>				
<b>PART</b>		<b>PAPER</b>	<b>Hrs</b>	<b>Cr</b>
I	22UTML11/ 22UHNL11/ 22UFNL11	Tamil/ Hindi/ French	6	4
II	22UENB11	English through Prose & Short Story (Stream B)	5	4
III	22UFSC11	Core -1 Principles of Food and Nutrition	5	4
	22UFSC21	Core-2 Fundamentals of Food Science	4	4
	22UFSP11	Core Lab –I Food Science and Nutrition Lab	3	2
	22UFSA11	Allied -1 Principles of Food Production	3	3
	22UFSQ11	Allied Lab-1 Food Production Lab	2	1
IV	22UFCE11	FC-Personality Development	1	1
	22UCSH11	Communication Skills	1	
	22UBRC11	Bridge Course		1
V	22UNSS/NCC/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club		-
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>II SEMESTER</b>				
I	22UTML22/ 22UHNL22/ 22UFNL22	Tamil/ Hindi/ French	6	4
II	22UENB22	English through Prose & Poetry (Stream B)	5	4
III	22UFSC32	Core -3 Nutritional Biochemistry	5	4
	22UFSC42	Core-4 Fundamentals of Food Technology	4	3
	22UFSP22	Core Lab-2 Nutritional Biochemistry & Food Technology Lab	3	2
	22UFSA22	Allied – 2 Fast Foods and Snacks Technology	3	3
	22UFSQ22	Allied Lab -2 Fast Foods and Snacks Technology Lab	2	1
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skills	1	1
V	22UNSS/NCC/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	---	1
		<b>Total</b>	<b>30</b>	<b>24</b>

III SEMESTER				
III		Tamil	6	4
	22UFSC53	Core -5 Food Processing and Engineering	5	4
	22UFSC63	Core-6 Technology of Cereals, Pulses and Oilseeds	4	3
	22UFSP33	Core Lab-3 Food Processing & Engineering & Technology Cereals , Pulses and Oilseeds and Food safety Lab	3	2
	22UFSA33	Allied- 3 Bakery and Confectionary Products	3	3
	22UFSQ33	Allied Lab -3 Bakery and Confectionary Lab	2	1
	IV	22USBZ13	Skill Based Elective- 1 Fundamentals of Computer, Internet and Office Automation	1
22USBY13		Fundamentals of Computer, Internet and Office Automation- Practical	2	1
22UFSN13		Basic Tamil/Advanced Tamil/Non-Major Elective : Basics of Food Science	3	2
22UFCE33		FC-Environmental Studies	1	1
V	22UNSS/NCC/PED/YRC/ROT/ACF/NCB24	Extension Activities NSS / NCC /Phy.Edn./ YRC / ROTARACT / AICUF / Nature Club	-	-
	22UARE14	ARISE		
		<b>Total</b>	<b>30</b>	<b>22</b>
IV SEMESTER				
PART		PAPER	Hrs	Cr
III		Tamil	6	4
	22UFSC94	Core- 8 Technology of Fruits, Vegetable and Plantation Crops	5	4
	22UFSD04	Core-9 Dairy Technology	4	3
	22UFSP44	Core Lab-4 Technology of Fruits, Veg. and Dairy Lab	3	2
	22UFSA44	Allied- 4 Food Microbiology	3	3
	22UFSQ44	Allied Lab -4 Food Microbiology Lab	2	1
IV	22USBZ24	Skill-Based Elective- 2 Web Design	1	1
	22USBY24	Web Design- Practical	2	1
	22UFSN24	Basic Tamil/Advanced Tamil/Non-Major Elective - Basics of Nutrition	3	2
	22UFCH44	FC- Religious Literacy and Peace Ethics	1	1
V	22UNSS/NCC/PED/YRC/ROT/ACF/NCB24	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1

	22UARE14	ARISE		1	
		<b>Total</b>	<b>30</b>	<b>24</b>	
<b>V SEMESTER</b>					
III	22UFSD15	Core -10 Technology of Meat and Poultry	6	6	
	22UFSD25	Core-11 Research Methodology and Statistics	5	5	
	22UFSP55	Core Lab -5 Technology of Meat, Poultry & Food safety Lab	4	2	
	22UFSD35	Core-12 Food Quality Testing and Evaluation	6	6	
	22UFSP65	Core Lab -6 Food Quality Testing Lab	3	2	
	22UFSE15	Core Elective 1– Food Quality Management/ / Food Laws and Regulations	4	3	
		In-plant Training			
IV	22USSI16	Soft Skill	2		
		<b>Total</b>	<b>30</b>	<b>24</b>	
<b>VI SEMESTER</b>					
III	22UFSD46	Core 13 Technology of Sea Foods	6	6	
	22UFSP76	Core Lab -7 Technology of Sea Foods Lab	3	2	
	22UFSD56	Core 14- Project management and Entrepreneurship	5	5	
	22UFSD66	Core 15 – Food Beverage Technology	6	6	
			Core Lab -8 Food Beverage Technology Lab	4	2
	22UFSE26	Core Elective – 2 Food Product Development & Marketing/ Food Packaging and Labelling	4	3	
		Project			
IV	22USSI16	Soft Skill	2	2	
		<b>Total</b>	<b>30</b>	<b>26</b>	

#### Self Learning Courses

Sem	Sub. Code	Title of the Paper	Credits
III	22UFSSL3	Basics of Food Preparation	3
IV	22UFSSL4	Food Preservation	3
V	22UFSSL5	Food Safety	3
VI	22UFSSL6	Food Processing	3



**DEPARTMENT OF  
TAMIL LITERATURE**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**OBE STRUCTURE for B.A. TAMIL LITERATURE (2022 – 2023 onwards)**

Part	Subject Code	Paper	Hrs	Cr
<b>I Semester</b>				
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil/ Hindi/French	06	4
II	22UENA11/ 22UENB11	English through Prose & Short Story - Stream – A English through Prose & Short Story - Stream -B	05	4
III	22UTLC11	Core: 1 இக்கால இலக்கியம் - I (புனைகதையும் உரைநடையும்)	06 06	5 5
	22UTLC21	Core: 2 இலக்கணம் - நன்னூல் - எழுத்து		
	22UTLA11	Allied – 1. கணிணித் தமிழும் இணையப் பயன்பாடும்	05	4
IV	22UFCE12	FC – Personality Development	01	01
	22UCSH12	Communication Skills	01	
	22UBRC11	Bridge Course	-	1
V	22UNCC/NSS/ YRC/PHY.EDU/ ROT/ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
			<b>30</b>	<b>24</b>
<b>II Semester</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil /Hindi /French	06	4
II	22UENA22/ 22UENB22	English through Prose & Poetry - Stream – A English through Prose & Poetry - Stream - B	05	4
III	22UTLC32	Core :3. இக்கால இலக்கியம் - II (கவிதை)	06	5
	22UTLC42	Core :4. இலக்கணம் - நன்னூல் - சொல்	06	4
	22UTLA22	Allied – 2. தமிழ்நாடு - வரலாறும் பண்பாடும்	05	4
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	01	1
	22UCSH12	Communication Skills	01	1
V	22UNCC/NSS/ YRC/PHY.EDU/ ROT/ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
			<b>30</b>	<b>24</b>
<b>III Semester</b>				
I	22UTAL33/ 22UHNL33/ 22UFNL33	Tamil /Hindi /French	06	4
II	22UENG33	English through Literature – I	06	4
III	22UTLC53	Core: 5. பக்தி இலக்கியம்	05	4

	22UTLA33	Allied – 3. இலக்கணம் - யாப்பு, அணி	05	4
	22UTLE13	Core Elective – 1. மக்கள் தகவல் தொடர்பியல் - அறிமுகம்	04	3
IV	22UTLN13	Basic Tamil/Advanced Tamil/Non-Major Elective – 1 கிறித்தவமும் தமிழும்	03	2
	22UFCE33	FC – Environmental Studies	01	01
V	22UNCC/NSS/ YRC/PHY.ED./ ROT/ACF/NCB24	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
	22UARE14	ARISE	-	-
			<b>30</b>	<b>22</b>
		<b>IV Semester</b>		
I	22UTAL44/ 22UHNL44/ 22UFNL44	Tamil /Hindi /French	06	4
II	22UENG44	English through Literature – II	06	4
III	22UTLC64	Core: 6. சிற்றிலக்கியம்	05	5
	22UTLA44	Allied – 4 இலக்கணம் - அகப்பொருள் - நம்பியகப்பொருள்	05	4
	22UTLE24	Core Elective – 2. இலக்கியமும் பெண்ணியமும் / தமிழ் இலக்கண வரலாறு	04	3
IV	22UTLN24	Non-Major Elective –2 போட்டித் தேர்வுகளில் தமிழ்	03	2
	22UFCH44	FC – Religious Literacy and Peace Ethics	01	1
V	22UNCC/NSS/ YRC/PHY.ED./ ROT/ACF/NCB24	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
	22UARE14	ARISE	-	1
			<b>30</b>	<b>25</b>
		<b>V Semester</b>		
III	22UTLC75	Core: 7. காப்பிய இலக்கியம்	05	5
	22UTLC85	Core: 8. இலக்கணம் - புறப்பொருள் – புறப்பொருள் வெண்பாமாலை	05	4
	22UTLC95	Core: 9. தமிழ் இலக்கிய வரலாறு	05	4
	22UTLD05	Core: 10. திறனாய்வியல்	05	4
	22UTLD15	Core: 11. நாடகக்கலையும் திரைப்படக் கலையும்	05	4

IV	22USBZ15	Skill Based Elective – 1 Fundamentals of computer, Internet and Office Automation	01	1
	22USBY15	Skill Based Elective – 1 Fundamentals of computer, Internet and Office Automation - Practical	02	1
	22USSI16	Soft Skills	02	
	22UINT15	Internship (Holidays)	0	1
			<b>30</b>	<b>24</b>
<b>VI Semester</b>				
III	22UTLD26	Core: 12. சங்க இலக்கியமும் அற இலக்கியமும்	05	5
	22UTLD36	Core: 13. இக்கால மொழியியல்	05	4
	22UTLD46	Core:14. தமிழர் அழகுக்கலைகள்	05	4
	22UTLD56	Core:15. பயன்பாட்டுத் தமிழ்	05	4
	22UTLD66	Core:16. நாட்டார் வழக்காற்றியல்	05	4
IV	22USBZ26	Skill Based Elective– 2 Web Design	01	1
	22USBY26	Skill Based Elective– 2 Web Design -Practical	02	1
	22USSI16	Soft Skills	02	2
			<b>30</b>	<b>25</b>

Semester	I	II	III	IV	V	VI	Total
Credits	24	24	22	25	24	25	144

#### Self Learning Courses - Additional Credits

Semester	Sub. Code	Courses	Credits
III	22UTLSL3	கலைச்சொல்லாக்கம்	3
IV	22UTLSL4	தமிழர் உணவியல்	3
V	22UTLSL5	தொல்லியல்	3
VI	22UTLSL6	தமிழர் கிராமியக் கலைகள்	3

**அருள் ஆனந்தர் கல்லூரி, (தன்னாட்சி),கருமாதூர் -625 514**  
**இளங்கலைத் தமிழ்**  
**காப்பிய இலக்கியம்**

வகுப்பு	: இளங்கலைத் தமிழ்	பகுதி	: III Core - 7
பருவம்	: ஜந்தாம் பருவம்	நேரம்	: 75 மணிகள்
பாடக்குறியீடு எண்	: 22UTLC75	மதிப்புள்ளிகள்	: 5

**நோக்கங்கள்:**

- தமிழ்க் காப்பியங்களை அறிதல்
- காப்பியங்களின் வழியாக பல்சமயச் சிந்தனையைப் பெறுதல்
- காப்பியங்களின் பொருட்டு சமய நல்லிணக்கத்தை ஏற்படுத்துதல்
- காப்பியங்களைத் தத்துவம் சார்ந்த நிலையில் புரிந்து கொள்ளுதல்

- கூறு 1: சமண பௌத்த காப்பியம் (15 மணிகள்)**  
 காப்பிய அறிமுகம் - வகை - இலக்கணம் - தமிழ் காப்பிய மரபு - கூறுகள்  
 சிலப்பதிகாரம் - மங்கல வாழ்த்துப் பாடல் (முழுவதும்)  
 மணிமேகலை - சிறைக்கோட்டம் அறக்கோட்டமாகிய காதை (முழுவதும்)
- கூறு 2: சைவ, வைணவ காப்பியம் (15 மணிகள்)**  
 கம்பராமாயணம் - மந்தரை சூழ்ச்சிப் படலம் முழுவதும் (84 பாடல்கள்)  
 பெரியபுராணம் - காரைக்கால் அம்மையார் புராணம் (முழுவதும்)
- கூறு 3: கிறித்தவ இஸ்லாமிய காப்பியம் (15மணிகள்)**  
 தேம்பாவணி - மூன்றாவது காண்டம்- முப்பதாவது படலம் - மீட்சிப்படலம் (115 - 160)  
 சீறாப்புராணம் - புலி வசனித்த படலம் முழுவதும்
- கூறு 4: இக்கால காப்பியம் - (I) (15 மணிகள்)**  
 பாரதியார் - பாஞ்சாலிசபதம் (முழுவதும்)  
 பாரதிதாசன் - சஞ்ஜீவி பர்வதத்தின் சாரல் (முழுவதும்)
- கூறு 5: இக்கால காப்பியம் - (II) (15மணிகள்)**  
 கண்ணதாசன் - ஆட்டனத்தி ஆதிமந்தி (முழுவதும்)

**பார்வை நூல்கள்:**

- சிலப்பதிகாரம் - அறிஞர் சா.வே.சுப்பிரமணியம் தெளிவுரை, மெய்யப்பன் பதிப்பகம். 2016
- சீவகசிந்தாமணி - சாரதா பதிப்பகம், வெளியீடு
- சீறாப்புராணம் - மூலமும் பொழிப்புரையும், மாஹின் பிரிண்டர்ஸ் 1999.
- மணிமேகலை - உமா பதிப்பகம், 2010
- கம்பராமாயணம் - கழக வெளியீடு, 2003
- பெரியபுராணம் - சாரதா பதிப்பகம் வெளியீடு
- தேம்பாவணி - தமிழ் இலக்கிய கழகம், வெளியீடு, 1964
- பாரதிதாசன் - கவிதை தொகுதி, நியு செஞ்சுரி புகஸ், சென்னை.

**கற்றல் கற்பித்தலின் விளைவுகள்**

பாடவிளைவு	கற்றல் கற்பித்தலின் விளைவுகள்	மதிப்பீட்டின் நிலை
CO1	தமிழ்க் காப்பியங்களை அறிந்து கொள்ளுதல்	K1
CO2	காப்பியங்களின் வழியாக பல்சமயச் சிந்தனையைப் பெறுதல்	K3
CO3	காப்பியங்களின் பொருட்டு சமய நல்லிணக்கத்தை ஏற்படுத்துதல்	K4
CO4	காப்பியங்களைத் தத்துவம் சார்ந்த நிலையில் புரிந்து கொள்ளுதல்	K3
CO5	இக்கால காப்பியங்கள் வழியாக நவீன படைப்பாளியின் படைப்பாளுமையைத் தெரிந்து கொள்ளுதல்	K4

- K1 – கற்றலின் அறிமுகம்
- K2 - பகுத்தாய்தல்
- K3 – திறன்களைக் கண்டறிதல்
- K4 – ஒப்புநோக்கல்
- K5 – ஒருங்கிணைந்த மதிப்பீட்டுப் பயன்களின் விளைவுகள்

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	1	3	1	2	3	2	2	2	2	2	3	26
CO2	3	2	1	3	2	3	2	3	2	3	2	2	3	31
CO3	3	3	1	2	3	2	2	2	2	3	2	2	3	30
CO4	3	2	1	2	1	2	2	2	2	2	3	2	1	25
CO5	3	2	1	2	1	2	3	2	3	2	2	2	1	26
<b>Grand Total of COs with PSOs and POs</b>														<b>138</b>
<b>Mean Value of Cos with PSO and POs</b>														<b>2.12</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.12
Observation	<b>COs of Strongly related with PSOs and POs</b>		

அருள் ஆனந்தர் கல்லூரி(தன்னாட்சி) கருமாத்தூர், மதுரை - 625514

தமிழ் இலக்கியத்துறை

இலக்கணம் - புறப்பொருள் - புறப்பொருள் வெண்பாமாலை

வகுப்பு : இளங்கலைத் தமிழ்

பகுதி : III Core - 8

பருவம் : ஐந்தாம் பருவம்

நேரம் : 75 மணிகள்

பாடக்குறியீட்டு எண் : 22UTLC85

மதிப்புப்புள்ளி : 4

நோக்கங்கள்

1. தமிழில் பொருள் இலக்கணங்களில் ஒன்றான புறப்பொருள் இலக்கணத்தை அறிந்து கொள்ளுதல்.
2. புறப்பொருள் வெண்பாமாலையில் இடம்பெற்றுள்ள திணைகள், துறைகள் ஆகியவற்றுக்கான தொடர்புகளைத் தெரிந்து கொள்ளுதல்.
3. போர் பற்றிய செய்திகளில் வெளிப்படும் அறம் சார்ந்த நிலைகளை அறிந்து கொள்ளுதல்
4. இலக்கியங்களின் வழி போர் பற்றிய கருத்துருவாக்கங்களையும் அன்றைய காலத் தேவைகளையும் அறிய வைத்தல்.
5. காலச்சூழலுக்குத் தகுந்தாற்போல் வாழ்வியல் விழுமியங்களின் மாற்றங்களை அறிந்து பயன்பெறச் செய்தல்

அலகு 1

(15 மணிகள்)

புறப்பொருள் - விளக்கம், புறப்பொருள் நூல்கள் - தொல்காப்பியம் - புறத்திணையியல் - புறப்பொருள் வெண்பா மாலை - பன்னிருபடலம் - திணைகள் - துறைகள் விளக்கம். வெட்சிப் படலம். கரந்தைப் படலம்

அலகு 2

(15 மணிகள்)

கரந்தைப் படலம், வஞ்சிப் படலம்.

அலகு 3

(15 மணிகள்)

காஞ்சிப் படலம், நொச்சிப் படலம்.

அலகு 4

(15 மணிகள்)

உழிஞைப் படலம், தும்பைப் படலம்.

வாகைப் படலம் பாடாண் படலம்.

பாட நூல்கள்

1. புறப்பொருள் வெண்பாமாலை, ஐயனாரிதனார், கழக வெளியீடு.

2. புறப்பொருள் வெண்பாமாலை, சுபாஷ்சந்திரபோஷ், NCBH வெளியீடு, மதுரை

பார்வை நூல்கள்

1. புறப்பொருள் வெண்பாமாலை, வ.த.இராமசுப்பிர மணியன், மீனாட்சிப் புத்தக நிலையம், மதுரை.(2009)
2. புறப்பொருள் வெண்பாமாலை, புலியூர்க் கேசிகன் தெளிவுரை, பாரி நிலையம், சென்னை.
3. அற்றை நாள் காதலும் வீரமும், க.ப. அறவாணன், மெய்யப்பன் தமிழாய்வு வெளியீடு.
4. தமிழில் வீரநிலைக் கவிதை, க.கைலாசபதி, குமரன் புத்தக இல்லம், 2012.

கற்பித்தல் முறைகள்:

1. விளக்குதல் முறை
2. விதி விளக்குதல் முறை
3. எடுத்துக்காட்டு தந்து விளக்குதல்
4. கலந்துரையாடல் முறை
5. ஒப்படை முறைக் கற்பித்தல்
6. சிந்தனைக்கிளறல் கற்பித்தல் முறை

பாடவிளைவு எண்	கற்றல் கற்பித்தல் விளைவுகள்	மதிப்பீட்டு நிலை
CO1	தமிழ் இலக்கண வளர்ச்சியாக புறப்பொருள் இலக்கணத்தை அறிதல்	K1
CO2	போருக்கும் கூட இலக்கணம் அறம் வகுத்த பாங்கினை புரிந்து கொள்ளுதல்.	K3
CO3	போரின் வாயிலாக புதிய நகரங்களையும் கருத்துருவாக்கங்களையும் கட்டமைக்க வேண்டிய அன்றைய காலத்தேவையை உணர்த்துதல்.	K4
CO4	தொல்காப்பியரின் கருத்துகளுக்கும் புறப்பொருள் வெண்பாமாலைக்கும் உள்ள தொடர்புகளை புரிந்து கொள்ளுதல்.	K3
CO5	உடல் வலிமை, மன வலிமை ஆகியவை எக்காலத்திற்கும் தேவையானவை என்ற பயன்பாட்டு உண்மையை அறியச் செய்தல்.	K4

K1 – கற்றலின் அறிமுகம்

K2 - பகுத்தாய்தல்

K3 – திறன்களைக் கண்டறிதல்

K4 – ஒப்புநோக்கல்

K5 – ஒருங்கிணைந்த மதிப்பீட்டின் பயன்களும் விளைவுகளும்

#### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	1	3	3	1	3	1	1	2	3	2	3	2	28
CO2	3	1	3	3	1	3	3	2	2	3	1	3	1	29
CO3	3	1	3	3	1	3	1	1	1	3	2	3	1	26
CO4	3	1	3	3	1	2	1	1	1	3	3		1	2
CO5	3	1	3	3	1	3	1	1	2	3	2		1	24
<b>Grand Total of COs with PSOs and POs</b>														<b>130</b>
<b>Mean Value of COs with PSO and POs</b>														<b>2.06</b>

Strong-3, Medium-2 & Low-1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of COs with PSOs and POs</b>			<b>2.06</b>
<b>Observation</b>	<b>COs of Strongly related with PSOs and POs</b>		

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி), கருமாதூர் - 625 514.

இளங்கலைத்தமிழ்  
தமிழ் இலக்கிய வரலாறு

வகுப்பு : இளங்கலைத்தமிழ்

பகுதி : III Core - 9

பருவம் : ஐந்தாம் பருவம்

நேரம் : 75 மணிகள்

பாடக்குறியீட்டு எண் : 22UTLC95

மதிப்புப்புள்ளி : 4

நோக்கங்கள்

- காலந்தோறும் மாறி வரும் தமிழிலக்கியத்தின் வரலாறு வளர்ச்சி, வடிவ மாற்றம், பாடுபொருள், போக்குகள் போன்றவற்றை குறித்து மாணவர்களுக்கு அறிவித்தல்.
- பழந்தமிழரின் இலக்கிய வளம், கவிதைக் கொடை, தமிழர் வாழ்வியல் போன்றவற்றை மாணவர்களுக்கு எடுத்துரைத்தல்
- மரபிலக்கணப்புவர்களையும் நவீன உரைநடை வளர்ச்சியும் மாணாக்கர்களுக்கு உணர்த்துதல்
- பண்டைத்தமிழரின் வாழ்வியல் முறைகளை எடுத்துரைத்தல்
- உரைநடை வளர்ச்சியின் படிநிலைகளே தற்கால இலக்கியத்தின் வளர்ச்சி எனக் கூறுதல்.

**கூறு : 1 சங்க இலக்கியமும் நீதி இலக்கியமும்** (15 மணிகள்)

சங்ககாலம்\_ சங்க இலக்கியங்கள் – எட்டுத்தொகை நூல்கள் – பத்துப்பாட்டு நூல்கள் – சங்கம் மருவிய காலம் – பதினெண் கீழ்க்கணக்கு நூல்கள் .

**கூறு : 2 காப்பிய இலக்கியங்கள்** (15 மணிகள்)

காப்பியங்கள் – ஐம்பெருங்காப்பியங்கள் – இரட்டைக்காப்பியங்கள் – சிலப்பதிகாரம் – சிலம்பின் சிறப்புக்கள் – மணிமேகலை.

**கூறு : 3 பக்தி இலக்கியங்களும் சிற்றிலக்கியங்களும்** (15 மணிகள்)

இருண்ட காலம் – பல்லவர்களும் பாண்டியர்களும் – நாயன்மார்கள் – ஆழ்வார்கள் – கம்பராமாயணம் – பெரியபுராணம் – உரையாசிரியர்கள் – இடைக்காலப் புலவர்கள் – சைவசித்தாந்த சாத்திரங்கள் – வைணவர்களின் தமிழ்த்தொண்டு – சித்தர் இலக்கியம் – இஸ்லாமியரின் தமிழ்த்தொண்டு.

**கூறு : 4 மறுமலர்ச்சிக்கால இலக்கியங்கள்** (15 மணிகள்)

ஆறுமுகநாவலர் – இராமலிங்கஅடிகள் -மகாவித்துவான் மீனாட்சி சுந்தரம் பிள்ளை – ஐரோப்பியர்களின் தமிழ்ப்பணி – கிறித்தவர்களின் தமிழ்ப்பணி.

**கூறு: 5 நவீன இலக்கியங்களும் வளர்ச்சி நிலைகளும்**

(15 மணிகள்)

இக்கால இலக்கியம் - சிறுகதை - மணிக்கொடி கதைகள் - பி.எஸ். இராமையா, கு.ப.ராஜகோபாலன், புதுமைப்பித்தன், கல்கி, மௌனி, கு.அழகிரிசாமி, அகிலன், ஜெயகாந்தன்- நாவல் - மாயூரம் வேதநாயகம்பிள்ளை, இராஜம் அய்யர், வை.மு.கோதை நாயகியம்மாள், கல்கி, மு.வரதராசன், ஜெயகாந்தன், தலித்திய நாவல்கள் - கவிதை - உரைநடை - புலம் பெயர் இலக்கியம் - இணைய தமிழ்.

**கற்றல் கற்பித்தல் வழிமுறைகள்:**

1. சங்க இலக்கிய நூல்களை அறிமுகம் செய்தல்
2. பண்டைக்கால வாழ்வியல் நெறிகளை இலக்கியம் வாயிலாக விளக்குதல்.
3. வினாநிரல்வழி பரிசோதித்தலும் துலங்கலும்.
4. புராண கால நிகழ்வுகளை தமிழ் இலக்கிய வரலாற்றுடன் விளக்கிக்கூறல்.
5. நவீன இலக்கிய ஆளுமைகளை மாணாக்கர்களுக்கு உணர்த்துதல்

**பாடநூல்:**

1. முனைவர் கி.இராசா, தமிழ் இலக்கிய வரலாறு  
நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட், 41-1௨, சிட்கோ இண்டஸ்டிரியல்  
எஸ்டேட், அம்பத்தூர். சென்னை-98, 2008.

**பார்வை நூல்கள்:**

1. முனைவர். பாக்கிய மேரி, வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட், 41-1௨, சிட்கோ இண்டஸ்டிரியல் எஸ்டேட், அம்பத்தூர். சென்னை-98, 2008.
2. ஞா.குருசாமி, தமிழ் இலக்கிய வரலாறு, அகரம், மனை எண் நிர்மலா நகர் - தஞ்சாவூர் - 07, 2018.
3. தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மயூரா வளாகம், 48 தானப்ப முதலி தெரு, மதுரை-01, 2011.
4. முனைவர் தேவிரா ( இராசேந்திரன்) தமிழ் இலக்கிய தகவல் களஞ்சியம், ஸ்ரீ நந்தினி பதிப்பகம், அண்ணாநகர், சென்னை-101, 2007.
5. எம்மார். அடைக்கலச்சாமி, தமிழ் இலக்கிய வரலாறு, ராசி பதிப்பகம், சென்னை- 73, 1960.

**கற்றல் கற்பித்தல் வழிமுறைகள்:**

1. சங்கஇலக்கியநூல்களை அறிமுகம் செய்தல்
2. பண்டைக்கால வாழ்வியல் நெறிகளை இலக்கியம் வாயிலாக விளக்குதல்.
3. வினாநிரல் வழி பரிசோதித்தலும் துலங்கலும்.
4. புராணகால நிகழ்வுகளை தமிழ் இலக்கிய வரலாற்றுடன் விளக்கிக்கூறல்.
5. நவீன இலக்கிய ஆளுமைகளை மாணாக்கர்களுக்கு உணர்த்துதல்

பாட விளைவு எண்	கற்றல் கற்பித்தலின் விளைவுகள்	மதிப்பீட்டுநிலை
CO1	சங்ககால இலக்கியம் பற்றி அறிமுகம் செய்தல்	K1, K2
CO2	பண்டைக்கால இலக்கியங்களை அவ்வக்காச் சூழலோடு ஒப்பிட்டுப் பகுத்தாய்தல்	K4
CO3	சங்க இலக்கிய நூல்களின் வளர்ச்சியை பிற்கால நீதி நூல்கள், சிற்றிலக்கியங்கள் என உணர்த்துதல்	K1, K2
CO4	இலக்கியங்களின் வாயிலாக சமூகத்தை ஒப்படைப்பு நோக்கல்	K2, K4
CO5	பக்தி இலக்கியங்கள் வாயிலாக தமிழர் தம் வாழ்வியல் தன்மைகளை புரிந்து கொள்ளுதல் மற்றும் காலந்தோறும் தமிழ் இலக்கிய வளர்ச்சிகளை மதிப்பிடுதல்	K2

K1 - கற்றலின் அறிமுகம்

K2 - ஒப்பிட்டுப்பார்த்தல்

K3 - இலக்கியங்களைக் கண்டறிதல்

K4 - ஒப்புநோக்கல்

K5 - புரிந்துகொள்ளுதல்

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	3	2	3	1	3	3	2	2	3	2	1	30
CO2	3	2	2	2	3	2	1	3	2	2	2	2	2	28
CO3	3	1	3	2	2	3	2	2	2	3	2	2	3	30
CO4	3	3	2	1	3	2	3	3	1	3			1	25
CO5	3	3	2	1	1	3	1	2	1	3	1	2		23
<b>Grand Total of COs with PSOs and POs</b>														<b>136</b>
<b>Mean Value of Cos with PSO and POs</b>														<b>2.19</b>

Strong-3, Medium-2 & Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.19</b>
Observation	COs of Strongly related with PSOs and POs		

அருள் ஆனந்தர் (தன்னாட்சி), கருமாதூர். – 625 514

இளங்கலைத் தமிழ்  
திறனாய்வியல்

வகுப்பு : இளங்கலைத் தமிழ்

பகுதி : III Core - 10

பருவம் : ஐந்தாம் பருவம்

நேரம் : 75 மணிகள்

பாடக்குறியீட்டு எண் : 22UTLD05

மதிப்புப்புள்ளி : 4

**நோக்கங்கள்**

- இலக்கியத் திறனாய்வு முறைகளைப் புரிந்துகொள்ளுதல்.
- இலக்கியக் கொள்கை, கோட்பாடுகளை அறிதல்.
- பழந்தமிழ் இலக்கியம் முதல் தற்கால இலக்கியங்களைத் திறனாய்வு நோக்கில் பகுப்பாய்வு செய்தல்.
- இலக்கியத்தின் கருத்து, வடிவம், கற்பனை, உணர்ச்சி வகைகளைத் தெளிதல்.
- மேலைநாட்டு இலக்கியக் கொள்கைகளைத் தமிழ் இலக்கியங்களில் ஒப்பிட்டு ஆராய்தல்.

**கூறு : 1 இலக்கியத் திறனாய்வு – விளக்கம்**

**(15 மணிகள்)**

எது இலக்கியத் திறனாய்வு? – யார் தரமான திறனாய்வாளர்? – திறனாய்வின் வகைகள் – படைப்புவிழித் திறனாய்வு – மரபுவிழித் திறனாய்வு – விதிமுறைத் திறனாய்வு – முருகியல் திறனாய்வு – விளக்கமுறைத் திறனாய்வு – மதிப்பீட்டுமுறைத் திறனாய்வு – வரலாற்றுமுறைத் திறனாய்வு – ஒப்பீட்டுமுறைத் திறனாய்வு – இலக்கிய மதிப்பீட்டுச் சிக்கல்கள் – உரையாசிரியர்கள் திறனாய்வாளர்களா?

**கூறு : 2 இலக்கியம் : உணர்ச்சியும் கற்பனையும் கருத்தும்**

**(15 மணிகள்)**

இலக்கியமாவது யாது? – இலக்கியப் பாகுபாடுகள் – தொல்காப்பியர் கூறும் இலக்கிய உணர்ச்சிகள் – இலக்கிய உணர்ச்சிகளை மதிப்பிடுதல் – கற்பனை – கற்பனையும் பயனும் – கற்பனை வகைகள் – படைப்புக் கற்பனை – இயைபுக் கற்பனை – கருத்து விளக்கக் கற்பனை – கற்பனையும் வெறுங்கற்பனையும் – இலக்கியத்தில் கருத்து பெறும் இடம் – உண்மையிலும் குறிக்கோள் நிலையும் – நடை – சிறந்த நடையை அறிவதற்குரிய வழிகள்.

**கூறு : 3 கவிதையும் புதுக்கவிதையும்****(15 மணிகள்)**

கவிதையின் விளக்கம் - கவிதையின் கூறுகள் - தொடைகள் - கவிதையின் கலை நுணுக்கத் திறன் - சொல்லாட்சி - சொற்றொடர்கள் - மக்கள் பேசும் பேச்சு வழக்கும் கிராமியச் சொற்களும் - பழமொழிகள் - உள்ளூறை உவமம் - கவிதை வகைகள் - தற்சார்புக் கவிதையும் தற்சாராக் கவிதையும் - காப்பியம் - கதைபொதி பாட்டு - நாடகப் பாட்டு - ஏதேனும் ஒரு மரபுக் கவிதையைத் திறனாய்வு செய்தல் - புதுக்கவிதை விளக்கம் - புதுக்கவிதையின் போக்குகள் - புதுக்கவிதைக்குரிய பொருள் கவிதையின் பொதுவான இயல்புகள் - ஏதேனும் ஒரு புதுக்கவிதையைத் திறனாய்வு செய்தல்.

**கூறு : 4 நாவலும் சிறுகதையும்****(15 மணிகள்)**

நாவல் என்றால் என்ன? நாவலுக்குரிய கதையும் கதைக் கோப்பும் - கதைக்குரிய பொருள் - கதைமாந்தர் - இருவகைக் கதைமாந்தர் - கதைமாந்தரைப் படைப்பதில் சில பொதுவான முறைகள் - உரையாடல் - சூழலமைப்பு - ஏதேனும் ஒரு புதினம், குறும்புதினத்தைத் திறனாய்வு செய்தல் - இக்கால இலக்கியங்களில் சிறுகதை பெறும் இடம் - சிறுகதையின் விளக்கம் - புதினத்திற்கும் சிறுகதைக்கும் உள்ள வேறுபாடுகள் - சிறுகதைக்குரிய ஒருமைப்பாடு - சிறுகதையில் உரையாடலும் வருணனையும் - சிறுகதைக்குரிய குறிக்கோள் - ஸ்டீவன்சன் காட்டும் மூன்று வகையான சிறுகதைகள் - ஏதேனும் ஒரு சிறுகதையைத் திறனாய்வு செய்தல்.

**கூறு : 5 நாடகம்****(15 மணிகள்)**

நாடகத்திற்கும் புதினத்திற்குமிடையே உள்ள வேறுபாடுகள் - நாடகத்தில் கதைக்கோப்பு - நாடகச் சிக்கலின் வகைகள் - பாத்திரங்கள் - நாடக அமைப்புகளும் அவற்றின் இயல்புகளும் - இணைவு - முரண் - நிகழ்ச்சிமுரண்பாட்டுக் குறிப்பு - இருபொருள் முரண்பாட்டுக் குறிப்பு - முன் அறிவுறு முரண் - காட்சி, கள அமைப்பு - இயற்கையில் இகந்த நிகழ்ச்சிகளை அமைத்தல் - நாடகத்திற்குரிய இடமும் காலமும் - ஏதேனும் ஒரு நவீன நாடகத்தைத் திறனாய்வு செய்தல்.

**பாடநூல்**

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#### கற்றல் திறன் வழிமுறைகள்

1. மின்திரை (PPT) வழிக் கற்பித்தல்.
2. விரிவுரை முறை ( Chalk and Talk Method )
3. கலந்துரையாடல் முறை
4. நூல் மதிப்புரை எழுத பயிற்சி அளித்தல்
5. இலக்கிய விமர்சனக் கட்டுரையாக்கப் பயிற்சி அளித்தல்.

#### கற்றல் கற்பித்தலின் விளைவுகள்

பாடவிளைவு எண்	கற்றல் கற்பித்தல் விளைவுகள்	மதிப்பீட்டு நிலை
CO1	இலக்கியத் திறனாய்வு முறைகளைப் புரிந்துகொள்ளுதல்.	K1
cO2	இலக்கியக் கொள்கை, கோட்பாடுகளை அறிந்துணர்தல்	K1
CO3	பழந்தமிழ் இலக்கியம் முதல் தற்கால இலக்கியங்களைத் திறனாய்வு நோக்கில் அணுகுதலும் பகுப்பாய்வு செய்தலும்	K3
CO4	இலக்கியத்தின் கருத்து, வடிவம், கற்பனை, உணர்ச்சி வகைகளைத் தெளிதல்.	K3
CO5	மேலைநாட்டு இலக்கியக் கொள்கைகளைத் தமிழ் இலக்கியங்களில் ஒப்பிட்டு ஆராய்தல்.	K4

K1 – கற்றலின் அறிமுகம்

K2 - பகுத்தாய்தல்

K3 – திறன்களைக் கண்டறிதல்

K4 – ஒப்புநோக்கல்

K5 – ஒருங்கிணைந்த மதிப்பீட்டின் பயன்களும் விளைவுகளும்

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	3	1	1	1	3	3	2	3	2	1	3	1	27
<b>CO2</b>	3	3	1	1	1	3	3	2	3	2	1	3	1	27
<b>CO3</b>	3	2	1	2	1	3	3	2	3	2	1	2	1	26
<b>CO4</b>	3	2	1	2	1	3	3	2	3	2	1	3	1	27
<b>CO5</b>	3	2	1	2	1	3	3	2	3	2	1	2	1	26
<b>Grand Total of COs with PSOs and POs</b>														<b>133</b>
<b>Mean Value of COs with PSO and POs</b>														<b>2.04</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and POs			<b>2.04</b>
Observation	<b>COs of Strongly related with PSOs and POs</b>		

அருள் ஆனந்தர் (தன்னாட்சி), கருமாத்தூர். – 625 514

இளங்கலைத் தமிழ்  
நாடகக்கலையும் திரைப்படக்கலையும்

வகுப்பு : இளங்கலைத் தமிழ்

பகுதி : III core -11

பருவம் : ஐந்தாம் பருவம்

நேரம் : 75 மணிகள்

குறியீடு : 22UTLD15

மதிப்புப்புள்ளி :4

**நோக்கம்**

- நாடகக்கலையை மரபோடும் நவினத்தோடும் அறிமுகம் செய்தல்
- மரபு, நவின நாடகப்பிரதிகளைக் கற்றறிதல்
- திரைப்படக் கலை வரலாற்றையும் தொழில் நுட்பங்களையும் கற்றல்
- திரைக்கதைப் பிரதியைக் கற்கும் முறையையும் எழுதும் முறையையும் பயிலுதல்.
- நாடகக்கலை மற்றும் திரைப்படக் கலைத் தொழில் நுட்பங்களைச் செய்முறை வடிவில் பயிலல்.

**அலகு 1**

(15 மணிகள்)

நாடக வரலாறு: பண்டைய தொன்மை நாடகங்களும் அதன்போக்கும் – தற்கால நாடகங்களும் அதன்போக்கும்- தொடக்ககால நாடகங்கள் – அரங்கவியல் - நாட்டார் அரங்கக் கலைகள் – நடிப்பு - ஒப்பனை - அரங்கம் - இசை.

**அலகு 2**

(15 மணிகள்)

நாடகப்பிரதிகள் - புராணநாடகங்கள் – வள்ளி திருமணம், நவின நாடகம் – ஒளவை.

**அலகு 3**

(15 மணிகள்)

தமிழ்த்திரைப்பட வரலாறும் தொழில்நுட்பமும் - தமிழ்த் திரைப்படக்கலை வரலாறு – சினிமா தோற்றமும் தொழில் நுட்பமும்: கேமிராக்கள், பிலிம், பிலிம் கேமிரா, லென்ஸ் – டிஜிட்டல் நிறத் தேர்வு, லைட்ஸ் - ஒளியமைக்கும் முறை: டிஜிட்டல் ஒளிப்பதிவு, இந்திய சினிமாவில் டிஜிட்டல் ஒளிப்பதிவு, டிஜிட்டல் திரைப்படங்கள், 3டி டிஜிட்டல் ஒளிப்பதிவு, அடிப்படைத் தொழில் நுட்பம், செல்போன் ஒளிப்பதிவு – படத்தொகுப்பு: விளக்கம், உத்திகள்.

அலகு 4

(15 மணிகள்)

திரைக்கதைப் பிரதிகள்: ஓநாயும் ஆட்டுக்குட்டியும்

அலகு 5

(15 மணிகள்)

செய்முறைப் பயிற்சி - நாடகப்பிரதிகள் எழுதுதல், நடிப்புக்கலையைப் பயிலுதல், ஓரங்க நாடகம், அங்கதநாடகம் - திரைக்கதை எழுதுதல், கேமிராக்களைக் கையாளுதல், ஒளிப்பதிவு முறைமைகள், எடிட்டிங் மென்பொருள்களை அறிதல், கையாளுதல், தமிழில் குறும்படங்கள், ஆவணப்படங்கள் உருவாக்குதல்.

பாடநூல்கள்

தி.கே.சண்முகம்

- நாடகக் கலை

சங்கரதாஸ் சுவாமிகள் நினைவு மன்றம்  
மீனாட்சி கலா நிலையம்,  
சென்னை.

1993

தமிழ்நாடு பாடநூல் கழகம்

- நவினநாடகங்கள்

சென்னை

அஜயன்பாலா

- தமிழ் சினிமா வரலாறு

நாதம் பதிப்பகம்., சென்னை.

2020

சி.ஜெ.ராஜ்குமார்

- ஒளி ஒவியம்

டிஸ்கவரி புக் பேலஸ்,

சென்னை.

2013

சி.ஜெ.ராஜ்குமார்

- டிஜிட்டல் ஒளிப்பதிவு நூல்

டிஸ்கவரி புக் பேலஸ்,

சென்னை.

2014

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ஒளவை

அகரம்

நிர்மலா நகர், தஞ்சாவூர்.

2003

மிஸ்கின்

- ஓநாயும் ஆட்டுக்குட்டியும்

பேசாமொழிப் பதிப்பகம்

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2015

சுஜாதா

- திரைக்கதை எழுதுவது எப்படி?

உயிர்மை பதிப்பகம்,

சென்னை.

2020

பார்வை நூல்கள்

முக்தா சீனிவாசன்

- தமிழ்த் திரைப்பட வரலாறு

கங்கை புத்தக நிலையம்,

சென்னை.

1993.

தமிழில் நவின நாடகம்

உலகத்தமிழராய்ச்சி நிறுவனம்,

சென்னை.

1996

தெ.மதுகுதனன், ச.ஜீவாகரன்

- அரங்கின் பரிமாணங்கள்

விபவி மாற்றுக் கலாச்சார மையம்,

இராஜகிரிய

1997

டி.டி.சங்கரதாஸ் சுவாமி

- வள்ளி திருமணம்

மதுரை புசுஷ்டிபாப்

மதுரை.

1934.

சுஜாதா

- திரைக்கதை பயிற்சிப் புத்தகம்

உயிர்மை பதிப்பகம்,

சென்னை.

2015

கற்றல் கற்பித்தல் விளைவுகள்

- விளக்கமுறை
- காணொலி வாயிலாக கற்பித்தல்
- கணினி நுட்பம் வழிக் கற்றல்
- கவிதை, சிறுகதையிலிருந்து உருவான குறும்படங்களைத்திரையிடல்
- சிறுகதையை படமாக்குகிற முயற்சி, வழிமுறையை விளக்குதல்

வ. எண்	கற்றல் விளைவுகள்	புளும்சு மதிப்பீடு
CO1	கூத்தை வரலாற்று நோக்கில் அறிதல்	K1
CO2	நடைமுறை வாழ்விலிருந்து நாடகத்தை படைத்தல் நடிகனுக்கான பயிற்சிகளை தெளிவுபடுத்தல்	K 2
CO3	திரைப்படக் கலையின் அடிப்படைகளை பயன்படுத்த கற்றுக் கொள்ளுதல்	k3
CO4	திரைக்கதையின் அடிப்படைகள் மற்றும் இயக்குனர் நடிகரின் பயிற்சி தேவைகளை புரிந்து உணர்தல்	K2
CO5	சிறுகதை கவிதையை கொண்டு குறும்படம் தயாரிக்க கற்றுக் கொள்ளுதல்	k 3

K1=கற்றலின் அறிமுகம்

K2= பகுத்தாய்தல்

K3=திறன்களை கண்டறிதல்

K4=ஒப்பு நோக்கல்

K5= ஒருங்கிணைந்த மதிப்பீட்டின் பயன்களும் விளைவுகளும்

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	3	3	2	3	2	3	3	2	3	2	2	2	33
CO2	2	2	3	2	2	2	2	2	2	3	2	2	1	27
CO3	3	3	3	1	2	2	3	3	2	3	2	2	1	30
CO4	2	3	3	1	2	2	2	2	2	3	2	2	1	27
CO5	2	3	3	1	2	2	3	3	2	3	2	2	1	29
<b>Grand Total of COs with PSOs and POs</b>														<b>146</b>
<b>Mean Value of COs with PSO and POs</b>														<b>2.24</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.24</b>
Observation	<b>COs of Strongly related with PSOs and POs</b>		

**அருள் ஆனந்தர் கல்லூரி, (தன்னாட்சி),கருமாதூர் -625 514**  
**இளங்கலைத் தமிழ்**  
**தொல்லியல்**

**வகுப்பு** : பி.ஏ / பி.எஸ்.ஸி **பகுதி** : Self Learning  
**பருவம்** : ஜந்தாம் பருவம் **நேரம்** :  
**பாடக்குறியீடு எண்** : 22UTLSL5 **மதிப்பீடுகள்** : 3

**நோக்கம்**

1. தொல்லியல் வரலாறு மற்றும் பயன்பாட்டு முறைகளை அறியச் செய்தல்
2. தொல்லியல் தரவுகள் வழிப் பழந்தமிழர் வரலாற்றைத் தெரிதல்.
3. தொல்லியல் ஆராய்ச்சி நெறிமுறைகள் மற்றும் கோட்பாடுகளை அறியச் செய்தல்
4. தொல்லியல் கல்வியின் நோக்கங்களைத் தெளிதல்.
5. தொல்லியல் முன்னோடிகள் மற்றும் வல்லுநர்களை அறியச் செய்தல்

- அலகு 1** தொல்பொருளியல் பொருள் விளக்கமும் நோக்க எல்லையும் - தொல்பொருளியலும் பிற துறைகளும் - புதிய தொல்பொருளியல்
- அலகு 2** தொல்லியின் வகைகள் - பொருளாதாரம் - இனவியல் - தொல்லியல்.
- அலகு 3** தொல்லியல் வல்லுநர்களின் தலையாய கடமைகள் - தொல்பொருளியலின் பயன்பாடுகள் தொல்பொருளியலின் வரலாறு - மண்ணியல் புரட்சி
- அலகு 4** பத்தொன்பதாம் நூற்றாண்டின் புரட்சிகர கண்டுபிடிப்புகள் - பத்தொன்பதாம் நூற்றாண்டின் தொல்பொருளியல் முன்னோடிகள் - சிந்துச் சமவெளி அகழாய்வு
- அலகு 5** தொல்பொருளியல் கோட்பாடுகள் - இந்தியாவின் தொல்லியல் வளர்ச்சி

**பாடநூல்**

1. தொல்லியல் , முனைவர் தி. மனோன்மணி , முனைவர் தி. செல்வநாயகி, நியூ செஞ்சரி புக் ஹவுஸ், மதுரை. - முதற் பதிப்பு - 2010

பாட விளைவு	கற்றல் கற்பித்தல் விளைவுகள்	மதிப்பீட்டு நிலை
CO1	தொல்லியல் வரலாற்றை அறிதல்	K1
CO2	தொல்லியல் வழி பழந்தமிழர் வரலாற்றை அறிதல்	K1, K3
CO3	தொல்லியல் ஆராய்ச்சி முறைகளைத் தெரிதல்	K3
CO4	தொல்லியல் கல்வியின் அவசியத்தை அறிதல்	K3
CO5	தொல்லியல் முன்னோடிகளை அறிதல்	K3

K1 – சுற்றலின் அறிமுகம்

K2 - பகுத்தாய்தல்

K3 – திறன்களைக் கண்டறிதல்

K4 – ஒப்புநோக்கல்

K5 – ஒருங்கிணைந்த மதிப்பீட்டின் பயன்களும் விளைவுகளும்

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	3	2	3	3	3	2	2	2	2	2	1		28
CO2	3	2	2	3	3	2	3	2	2	2	2	1		27
CO3	3	3	3	2	1	2	3	3	2	1	2	1		26
CO4	3	2	3	2	1	3	2	2	2	3	1	2	2	28
CO5	2	3	2	3	1	3	2	3	2	2	1	1	2	27
<b>Grand Total of COs with PSOs and POs</b>														<b>136</b>
<b>Mean Value of Cos with PSO and POs</b>														<b>2.19</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.19
Observation	<b>COs of Strongly related with PSOs and POs</b>		

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி), கருமாதூர் - 625 514.

இளங்கலைத் தமிழ் இலக்கியம்  
சங்க இலக்கியமும் அற இலக்கியமும்

வகுப்பு : இளங்கலைத் தமிழ்

பகுதி : III Core-12

பருவம் : ஆறாம் பருவம்

நேரம் : 75 மணிகள்

பாடக்குறியீட்டு எண் : 22UTLD26

மதிப்புப்புள்ளி : 5

**நோக்கங்கள்**

- பழந்தமிழ் இலக்கிய மரபுகளான அகத்திணை, புறத்திணைப் பாடல்களை அறிமுகம் செய்தலும் பழந்தமிழ் இலக்கியக் கோட்பாடுகளில் தெளிவு பெறுதலும்.
- பழந்தமிழர்களின் வாழ்வியல், பண்பாட்டுக் கூறுகளைப் புரிந்து கொள்ளுதல்.
- தமிழர்களின் கல்வி, வீரம், கொடை, விருந்தோம்பல் முதலானவற்றின் வளர்ச்சி நிலைகளைப் புரிந்துகொள்ளுதல், சமகால நிலையுடன் ஒப்பிட்டு ஆய்தல்.
- பழந்தமிழ்ச் சொற்களின் தொன்மை குறித்த புரிதலை ஏற்படுத்துதல்.
- பழந்தமிழர் அறச்சிந்தனைகளின் தற்காலத் தேவையை வலியுறுத்துதல்

கூறு : 1 சங்க இலக்கியத்தில் அகம்

(15 மணிநேரம்)

அ) ஐங்குறுநூறு - குறிஞ்சி - மஞ்சைப்பத்து

ஆ) குறுந்தொகை - முல்லை (5 பாடல்கள்)

பல்லா நெடுநெறிக் கன்று... - (64)

வன்பாற் றெள்ளறல் பருகிய... - (65)

மடவ மன்ற தடவுநிலைக் கொன்றை... - (66)

பெருந்தண் மாரிப் பேதைப் பித்திகத் ... - (94)

அவரோ வாரார் முல்லையும் பூத்தன ... - (221)

இ)நற்றிணை - மருதம் -(5 பாடல்கள்)

ஐய குறமகட் கண்டிகும் வைகி ... - (20)

கண்டனென் - மகிழ்ந - கண்டு - (30)

நெடு நா ஒள் மணி கடி மனை இரட்ட ... - (40)

கழுநீர் மேய்ந்த கருந்தாள் எருமை.. - (260)

சுடர்த்தொடிக் கோமகள் சினந்தென, ... - (300)

ஈ) அகநானூறு - நெய்தல் (3 பாடல்கள்)

பெருநீர் அழுவத்து எந்தை தந்த ... - (20)

பெருங் கடற் பரப்பில் சேயிரா - (60)

கானலும் கழறாது கழியும் கூறாது - (170)

**உ) கலித்தொகை – பாலை ( 2 பாடல்கள்)**

செவ்விய தீவிய சொல்லி - (19)

எஃகு இடை தொட்ட கார்க் கவின் - (32)

**கூறு : 2 சங்க இலக்கியத்தில் - புறம்**

**(15 மணிநேரம்)**

**அ) பதிற்றுப்பத்து - அரிசில்கிழார் - 8ஆம் பத்து - முழுவதும் - 10 பாடல்கள்**

**ஆ) புறநானூறு - திணை - பொதுவியல் (5 பாடல்கள்)**

அற்றைத் திங்கள் அவ்வெண் நிலவில் (112)

ஒரு சார் அருவி ஆர்ப்ப (115)

தீம் நீர்ப் பெருங் குண்டு சுனைப்பூத்த (116)

பொன்னும், துகிரும் , முத்தும், மன்னிய (218)

பெருஞ்சோறு பயந்து, பல்யாண்டு புரந்த (220)

**கூறு : 3 சங்க காலப் பெண்பாற் புலவர்கள் அறிமுகம் –**

**(15 மணிநேரம்)**

**அள்ளூர் நன்முல்லையார்(3) - குறுந்தொகை -32- காலையும் பகலுங்**

- குறுந்தொகை -67- உள்ளார் கொல்லோ

- குறுந்தொகை -96- அருவி வேங்கைப்

**ஒக்கூர் மாசாத்தியார்(3)**

- குறுந்தொகை -139- மனையுறை கோழிக்

220- பழமழைக் கலித்தபுதுப்புன

275- முல்லையூர்ந்த கல்லுய ரேறிக்

**ஒளவையார் (3)**

- குறுந்தொகை - 23 – அகவன் மகளே அகவன் மகளே

28- முட்டுவேன்கொல்

43 – செல்வார் அல்லரென்

**காக்கைப்பாடியியார்(2)**

- குறுந்தொகை – 210 – திண்தேர் நள்ளி கானத்து

புறநானூறு 278 - நரம்பு எழுந்து உலறிய

**வெள்ளிவீதியார்(3)**

குறுந்தொகை - 27- கன்றும் உண்ணாது

குறுந்தொகை - 44- காலே பரிதவிப் பினவே

குறுந்தொகை - 130- நிலந்தொட்டுப் புகார்

கூறு : 4 அற இலக்கியம்

(15 மணிநேரம்)

- அ. திருக்குறள் - அறம் - இன்னா செய்யாமை -(32 ஆவது அதிகாரம்)  
பொருள் - காலமறிதல் -( 49 ஆவது அதிகாரம்)  
இன்பம் - காதற் சிறப்புரைத்தல் - (113 ஆவது அதிகாரம்)  
ஆ.நாலடியார் - கல்வி (அதிகாரம் முழுவதும் )

கூறு : 5 அற இலக்கியம்

(15 மணிநேரம்)

அ. கொன்றை வேந்தன் (முழுவதும்)

பார்வை நூல்கள்:

1. முனைவர்.பாக்கிய மேரி, வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட், 41-12 ,சிட்கோ இண்டஸ்டிரியல் எஸ்டேட், அம்பத்தூர். சென்னை-98,2008.
2. ஞா.குருசாமி, தமிழ் இலக்கிய வரலாறு, அகரம், மனை எண் நிர்மலா நகர் - தஞ்சாவூர் - 07,2018.
3. தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மயூரா வளாகம், 48 தானப்ப முதலி தெரு, மதுரை-01,2011.
4. முனைவர் தேவிரா (இராசேந்திரன்) தமிழ் இலக்கிய தகவல் களஞ்சியம், ஸ்ரீ நந்தினி பதிப்பகம், அண்ணாநகர், சென்னை-101,2007.
5. எம்மார்.அடைக்கலச்சாமி, தமிழ் இலக்கிய வரலாறு, ராசி பதிப்பகம்,சென்னை-73,1960.

கற்றல், கற்பித்தல் வழிமுறைகள்

- விரிவுரை தந்து விளக்குதல்
- பண்பாட்டியல் தொடர்பான கலந்துரையாடல்
- காணொலி வழி விளக்குதல்
- மின்திரை வழிக் கற்பித்தல்

கற்றலின் விளைவுகள்

பாடவிளைவு எண்	கற்றலின் விளைவுகள்	மதிப்பீட்டு நிலை
CO1	பழந்தமிழ் இலக்கிய மரபுகளான அகத்திணை, புறத்திணைப் பாடல்களை அறிமுகம் செய்தலும் பழந்தமிழ் இலக்கியக் கோட்பாடுகளில் தெளிவு பெறுதலும்.	K <sub>1</sub>
CO2	பழந்தமிழர்களின் வாழ்வியல், பண்பாட்டுக் கூறுகளைப் புரிந்து கொள்ளுதல்	K <sub>2</sub>

CO3	தமிழரின் வாழ்வியல் மாண்புகளை ஒப்பிட்டு அறிதல்	K <sub>4</sub>
CO4	பழந்தமிழ் இலக்கியங்களின் உலகளாவிய சிந்தனைகளை வெளிப்படுத்துதல்	K <sub>3</sub>
CO5	தமிழரின் அறச்சிந்தனைத் தெளிந்து பின்பற்றுதல்	K <sub>3</sub>

K1 – கற்றலின் அறிமுகம்

K2 - பகுத்தாய்தல்

K3 – திறன்களைக் கண்டறிதல்

K4 – ஒப்புநோக்கல்

K5 – ஒருங்கிணைந்த மதிப்பீட்டின் பயன்களும் விளைவுகளும்

#### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	3	2	3	3	2	2	3	2	2		2	2	29
CO2	3	3	3	2	2	2	2	3	2	2	3	2	2	31
CO3	2	2	3	2	2	2	2	3	3	2	3	2	2	30
CO4	2	3	2	2	3	2	2	3	3	2		2	2	28
CO5	2	2	3	1	3	2	2	3	3	2		2		25
<b>Grand Total of COs with PSOs and POs</b>														<b>143</b>
<b>Mean Value of COs with PSO and POs</b>														<b>2.34</b>

Strong-3, Medium-2 & Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and POs			<b>2.34</b>
Observation	COs of Strongly related with PSOs and POs		

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி), கருமாதூர் - 625 514.

இளங்கலைத்தமிழ்  
இக்கால மொழியியல்

வகுப்பு : இளங்கலைத்தமிழ்

பாடம் : III Core 13

பருவம் : ஆறாம் பருவம்

நேரம் : 75 மணிகள்

பாடக்குறியீட்டு எண் : 22UTLD36

மதிப்புப்புள்ளி : 4

#### நோக்கங்கள்

- மொழியின் தோற்றமும் காரணங்களையும், மொழிக்கட்டமைப்பு அடிப்படைகளையும் அறிதல்
- மொழியின் ஒலிக்கட்டமைப்பும் மனித உடற்கூறுகளின் மொழியியல் இயங்குதன்மையும் அறிதல்.
- மொழியியல் கோட்பாடுகளைப் பயன்படுத்தி மொழியின் இயக்கக்கூறுகளைக் கண்டறிதல்
- மொழியின் உச்சரிப்பு மற்றும் பொருள்தரும் முறைகளை மொழியியல் நோக்கில் விதிகளோடுப் பொருத்தி மொழி இயங்கு தன்மைகளை அறிதல்.
- மொழியியல் விதிகளைத் தற்காலச் சூழலோடு பொருத்திப் பார்த்தலும் விளைவுகளைக் அறிதலும்

அலகு-1

15 மணிகள்

#### மொழியும் மொழியியலும்

மொழி - மொழியியல் வரலாறு - மொழியியல் பிரிவுகள் - இலக்கணமும் மொழியியலும் - தனிமொழி, ஒட்டுமொழி, விசுதி மொழி.

#### ஒலியியல்

ஒலியியல் பிரிவுகள் - பேச்சொலி உருவாகுதல் - ஒலிக்கும் உறுப்புக்களும் அவற்றின் தொழிலும் - பேச்சொலிவகைகள் - ஒலியெழுது முறை

அலகு-2

15 மணிகள்

#### ஒலியனியல்

ஒலியன் என்றால் என்ன? - ஒலி, ஒலியன், மாற்றொலியன் - ஒலியன்களைக் கண்டுபிடித்தல், ஒலியன் கொள்கைகள் - சார்பு ஒலியன்கள், ஒலியன்கள் வருகை - ஓரினமாதல் - மேல்நிலை ஒலியன்கள்

அலகு-3

15 மணிகள்

#### உருபனியல்

உருபன் வரையறை - உருபு உருபன் மாற்றுருபு - உருபனைக் கண்டறிதல் - உருபன்களின் அமைப்பு - உருபன்களின் வகைகள் - உருபன்களின் வருகை - சொல்லாக்கம்

#### உருபொலியனியல்

அகப்புணர்ச்சி - புறப்புணர்ச்சி - மாற்றங்கள் - ஒற்றுமிகுதல்  
சொல்வகை - பெயர்ச்சொல் - வினைச்சொல் - இடைச்சொல்

அலகு-4

15 மணிகள்

#### தொடரியல்

தொடரியல் பண்புகள் - தொடரமைப்பு - தொடர் வகைகள் - வேற்றுமை அண்மை உறுப்பு - மாற்றிலக்கணம்.

#### கிளை மொழியியல்

தனிமொழி - கிளைமொழி - பொதுமொழி

பேச்சுமொழியும் எழுத்துமொழியும். - தொல்காப்பியத்தில் மொழியியல் கூறுகள் -  
மொழியியலின் தேவையும் பன்முகப் பயன்பாடும் - தமிழ்ச்சூழலில் மொழியியல் ஆய்வுகள் -  
அறிஞர்கள் அறிமுகம்

**பாடநூல் :**

1. கு.பரமசிவம், இக்கால மொழியியல், 2010 அடையாளம் வெளியீடு, திருச்சி.

**பார்வை நூல்:**

1. முனைவர்.சிவ.மணிகண்டராமன், தமிழ் மொழியியல் அறிமுகம், 2010 **NCBH**, சென்னை.
2. டாக்டர் முத்துச்சண்முகன், இக்கால மொழியியல், 2007 முல்லை நிலையம், தி.நகர், சென்னை-17.
3. டாக்டர் மு.வரதராசன், மொழி வரலாறு, 2002 பாரி நிலையம், சென்னை.
4. டாக்டர் ரா.சீனிவாசன், மொழியியல், 2007 முல்லை நிலையம். சென்னை.

**கற்றல் கற்பித்தல் வழிமுறைகள்**

1. மொழி தோற்றத்தினைக் காலத்தோடும் காரணங்களோடும் விளக்குதல்
2. உச்சரிப்பு, பொருள்தரும் முறைமைகளை மொழியியல் கூறுகளோடு விளக்குதல்.
3. மொழியியல் விதிகளைப் பயன்படுத்தி ஒலியன், உருபன்களைக் கண்டறியும் செயல்முறைகளை எடுத்துக்காட்டுகளுடன் விளக்குதலும் பரிசோதித்தறிதலும் துலங்கலும்
4. ஒலிப்பு முறைகளுக்கும் தொடரியல் கொள்கைகளுக்குமான தொடர்புகளை ஒலிப்புக் கருவிகளைப் பயன்படுத்தி விளக்குதல்.
5. மொழிக் கோட்பாடுகளை பிற மொழித் தரவுகளுடன் பொருத்திப் பரிசோதித்தல்.

**கற்றல் கற்பித்தலின் விளைவுகள்**

வ.எண்	கற்பித்தல் கற்றல் விளைவுகள்	புளும்சுமதிப்பீடு
CO1	மொழி தோற்றம் மற்றும் அடிப்படைகளைப் பற்றிய அறிமுகம் பெறுதல்	<b>K1</b>
CO2	மொழியின் ஒலிக்கட்டமைப்பும் மனித உடற்கூறுகளின் மொழியியல் இயங்குதன்மையும் பெறுதல்	<b>K1, K3</b>
CO3	மொழியியல் கோட்பாடுகளைப் பயன்படுத்தி மொழியின் இயக்கக்கூறுகளைக் கண்டறிதல்	<b>K2</b>
CO4	மொழியின் உச்சரிப்பு மற்றும் பொருள்தரும் முறைகளை மொழியியல் விதிகளோடுப் பொருத்தி மொழி இயங்கு தன்மைகளை பகுத்தாய்தல்.	<b>K3</b>
CO5	மொழியியல் விதிகளைத் தற்காலச் சூழலோடு பொருத்திப் பார்த்தலும் விளைவுகளைக் அறிதலும்	<b>K2</b>

- K1 = கற்றலின் அறிமுகம்
- K2 = பகுத்தாய்தல்
- K3 = திறன்களைக்கண்டறிதல்
- K4 = ஒப்புநோக்கல்
- K5 = ஒருங்கிணைத்து மதிப்பீட்டின் பயன்களின் விளைவுகளும்

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	1	3	3	1	3	1	1	2	3	2		2	25
<b>CO2</b>	3	1	3	3	1	3	3	2	2	3	1	3	1	29
<b>CO3</b>	3	1	3	3	1	3	1	1	1	3	2	3	1	26
<b>CO4</b>	3	1	3	3	1	2	1	1	1	3	3		1	23
<b>CO5</b>	3	1	3	3	1	3	1	1	2	3	2	3	1	27
<b>Grand Total of COs with PSOs and POs</b>														<b>130</b>
<b>Mean Value of Cos with PSO and POs</b>														<b>2.06</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.06</b>
Observation	<b>COs of Strongly related with PSOs and POs</b>		

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி), கருமாத்தூர் – 62 514

இளங்கலைத்தமிழ் இலக்கியம்  
தமிழர் அழகுக்கலைகள்

வகுப்பு : இளங்கலைத்தமிழ்

பகுதி : III Core - 14

பருவம் : ஆறாம் பருவம்

நேரம் : 75 மணிகள்

பாடக்குறியீட்டு எண் : 22UTLD46

மதிப்புப்புள்ளி : 4

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### நோக்கங்கள்

- கலைகள் குறித்த பொதுவான விளக்கங்களை அறியச் செய்தல்.
- கலைகளின் வகைகளையும் இக்கலைகள் மீது தமிழர்கள் கொண்டிருந்த ஆர்வ நிலையையும் எடுத்துரைத்தல்.
- கலைகளின் நுணுக்கங்களை கண்டறிதல்
- கலைகளோடு காப்பியங்களை பொருத்திப்பார்த்தல்
- கள ஆய்வின் வழியாக பண்டையக் கால கலைகளை ஆராய்ந்து அறிதல்

கூறு 1 – கலைகளை அறிமுகம் செய்தல் – அழகுக் கலைகள் (15 மணிகள்)

எவை? அழகுக்கலைகளின் பண்பு – அழகுக்கலையின் வகை – இயற்றமிழ் – இசைத்தமிழ் – நாடகத்தமிழ் – ஓவியம் இவைகளைப் பற்றி அறிதல்

கூறு 2 – கட்டக்கலை – கோயில் வகைகள் (15 மணிகள்)

செங்கற் கட்டங்கள் – பாறைக் கோயில்கள் – கற்றளிகள் – கோயில்களின் தரைமைப்பு பற்றி விளக்குதல் (கள ஆய்வு மேற்கொள்ளல்)

கூறு 3 – சிற்பக்கலை – ஓவியக்கலை (15 மணிகள்)

சிற்பம் அமைக்கும் பொருள்கள் – இரண்டு வகைச் சிற்பம் – தத்ரூப உருவங்கள் – கல்லும் உலோகமும் – யவன நாட்டுச் சிற்பமும் நமது நாட்டுச் சிற்பமும் பௌத்த ஜைன சிற்பங்கள் – சோழர் பிரதிமைகள் – அலங்காரம் ஏன்?

கூறு 4 – கூத்துக் கலை – காவியக்கலை (15 மணிகள்)

பதினொர் ஆடல் – பரதநாட்டியம் சிந்தாமணி – சூளாமணி – சங்கால இலக்கியம் – இடைக்கால இலக்கியம்.

கூறு 5 – களப்பணி (15 மணிகள்)

கோயிற்கலைத் தொடர்பாக சுற்றுலா சென்று மாணவர்களிடம் கோயில்களை பார்வையிடச் செய்து தரவுகளைச் சேகரித்தல்.

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### பார்வை நூல்கள்

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4. இரா. நாகசாமி, தமிழக கோயில் கலை வரலாறு – 2000
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### கற்றல் கற்பித்தல் வழிமுறைகள்

- கலைகளைப் பற்றி அறிமுகம் செய்தல்.
- கலைகள் தொடர்பான நபர்களை சந்தித்தல்.
- கலைகள் தொடர்பான இடங்களுக்கு நேரில் சென்று செய்திகளை சேகரித்தல்
- செய்திகளை காட்சிப் படுத்துதல்.
- குழுக்களாக பிரிந்து கலந்துரையாடல்.

பாடவிளைவு எண்	கற்றல் கற்பித்தல் விளைவுகள்	புள்ளி மதிப்பீடு
CO1	கலைகளை அறிமுகம் செய்தல்	K1
CO2	கட்டிக்கலை தொடர்பான செய்திகளை அறிய செய்தல்	K2
CO3	கலைகளின் சிறப்பம்சங்களை ஒப்பிட்டுப் பார்த்தல்	K3
CO4	கலைகளின் நுணுக்கங்களை கண்டறிதல்	K3
CO5	மாணவர்களை நேரில் அழைத்து சென்று கலந்துரையாடல்	K2

K1 – கற்றலின் அறிமுகம்.

K2 – பகுத்தாய்தல்.

K3 – திறன்களைக் கண்டறிதல்.

K4 – ஒப்புநோக்கல்.

**K5 - ஒருங்கிணைத்து மதிப்பீட்டின் பயன்களின் விளைவுகள்**

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	2	2	3	2	3	1	3	3	2	2			1	24
CO2	2	2	2	2	3	2	1	3	2	2	2	2	2	27
CO3	3	1	3	2	2	3	2	2	2	3	2	2	1	28
CO4	3	3	2	1	3	2	3	2	1	3	1		1	25
CO5	3	3	2	1	1	3	1	2	1	2	1	2		22
<b>Grand Total of COs with PSOs and Pos</b>														<b>126</b>
<b>Mean Value of Cos with PSO and Pos</b>														<b>2.06</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.06
Observation	COs of Strongly related with PSOs and POs		

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி), கருமாத்தூர் - 625 514.

இளங்கலைத்தமிழ் இலக்கியம்

பயன்பாட்டுத் தமிழ்

வகுப்பு : இளங்கலைத் தமிழ்

பகுதி : III Core - 15

பருவம் : ஆறாம் பருவம்

நேரம் : 75 மணிகள்

பாடக்குறியீட்டு எண் : 22UTLD56

மதிப்புப்புள்ளி : 4

நோக்கங்கள் :

- பிழையின்றி எழுதுவதற்கானத் திறனைப் பெறச் செய்தல்.
- பல்வேறு துறைசார்ந்த கலைச்சொற்களைத் தெரிதல்.
- கடிதம் மற்றும் கட்டுரை எழுதும் முறைமையை அறியச் செய்தல்.
- விளம்பரங்களில் தமிழ்மொழி பெறுமிடத்தை அறியச் செய்தல்.
- நூல் பதிப்பித்தல் மற்றும் திருத்தம் செய்யும் முறையை அறிந்து கொள்ளல்.

**கூறு - 1 தொடர் பிழைகளும் திருத்தங்களும்**

**(15 மணிகள்)**

வழுஉச் சொற்கள், லகர- ளகர-ழகர பொருள் வேறுபாடு, ரகர - றகர பொருள் வேறுபாடு, நகர- னகர பொருள் வேறுபாடு, னகர - ணகர பொருள் வேறுபாடு, வல்லினம் மிகுமிடங்கள், வல்லினம் மிகா இடங்கள், பிறமொழிச் சொற்களும் தமிழ்ச்சொற்களும்.

**கூறு - 2 கலைச்சொல்லாக்கம்**

**(15 மணிகள்)**

ஆட்சித்துறைச் சொற்கள், துறைவாரிச் சொற்கள் - அரசியல்- உளவியல்- கணினிஅறிவியல் - மருத்துவம் - நீதித்துறை -அலுவலகக் குறியீடுகளும் சுருக்கங்களும்

**கூறு - 3 கடிதம் மற்றும் கட்டுரை எழுதுதல்**

**(15 மணிகள்)**

கடிதத்தின் அமைப்பு - கடிதத்தின் வகைகள் -கட்டுரைத் தலைப்பு -முகவுரை - கட்டுரையின் உடல்பகுதி - துணைத் தலைப்புகள் - பத்தி அமைத்தல் - மேற்கோள்கள் - மொழிநடை - துறை மற்றும் கலைச்சொற்கள் - முடிவுரை - கட்டுரை வகைகள்.

**கூறு - 4 விளம்பரத் தமிழ்**

**(15 மணிகள்)**

விளம்பர நிறுவனங்கள்-மொழியும் விளம்பரமும் -அணியிலக்கண அறிவும் விளம்பரமும்-நெஞ்சில் நிற்கும் வாசகங்கள் -விளம்பரத் துறையில் தமிழுக்கு என்ன வாய்ப்பு?-விளம்பர வகைகள் - விளம்பரங்களில் நிறைகளும் குறைகளும்.

**கூறு - 5 பதிப்பாசிரியர், மெய்ப்புத் திருத்தலும் நூலாக்கப் பணியும்**

**(15 மணிகள்)**

பதிப்பாசிரியர் யார்? - தகுதிகள் பெறும் விதம் - மொழியறிவு - பயிற்சிகள் - தகவல் பிழைகள் - மெய்ப்புத் திருத்தப் பணி - ஒரு தொடக்கமே -கூரிய பார்வை -பொறுமை தேவை - செய்ய வேண்டியவை -மெய்ப்புத் திருத்தக் குறிகள் - குறியீடுகளைப் பயன்படுத்தும் முறைகள்

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### பார்வை நூல்கள்

- இலக்கண உலகில் புதிய பார்வை, டாக்டர் பொற்கோ, தொகுதி -3, NCBH, 2000
- பயன்பாட்டுத்தமிழ், ஸ்ரீசந்திரன், வர்த்தமானன் பதிப்பகம், சென்னை, 2010.
- பயன்பாட்டுத் தமிழ், முனைவர். அரங்க. இராமலிங்கம், முனைவர் ஒப்பிலா மதிவாணன், சென்னைப் பல்கலைக்கழக வெளியீடு, 2000.
- ஸ்ரீசந்திரன், மொழித்திறன், தமிழ் நிலையம், சென்னை, 2007.

### கற்றல், கற்பித்தல் வழிமுறைகள்

- அறிமுகநிலை
- விரிவுரைமுறை
- பயிற்சி வழிக் கற்பித்தல், கற்றல்
- மின்திரை வழிக் கற்பித்தல், கற்றல்
- கலந்துரையாடல் முறையில் கற்றல்

### கற்றலின் விளைவுகள்

வ.எண்	கற்றல் விளைவுகள்	புளும்சு மதிப்பீடு
CO1	மொழியின் பயன்பாடுகளை தெளிதல், புரிதல்.	K <sub>2</sub>
CO2	மொழியினைப் பிழையின்றி எழுதுவதற்கான தெளிவு பெறல்.	K <sub>2</sub>
CO3	மொழிப்பயன்பாட்டுத் துறைகளை அறிந்து பயன்படுத்துதல்.	K <sub>3</sub>
CO4	எதிர்காலப் பயன்பாட்டிற்குரிய முறையில் தொழில்நுட்பத்திற்கேற்ற வகையில் தமிழ்மொழியினைப் பயன்படுத்துதல்.	K <sub>3</sub>
CO5	மொழி பயன்பாட்டின் ஆளுமைகளை புரிந்து கொள்ளல்.	K <sub>3</sub>

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	2	3	2	3	1	3		2	2	3	2	1	27
<b>CO2</b>	3	2	2	2	3	2	1	3	2	2	2	2	2	28
<b>CO3</b>	3	1	3	2	2	3	2	2	2	3	2	2	3	30
<b>CO4</b>	3	3	2	1	3	2	3	3	1		1	2	1	25
<b>CO5</b>	3	3	2	1	1	3	1	2	1	3	1	2		23
<b>Grand Total of COs with PSOs and POs</b>														<b>133</b>
<b>Mean Value of Cos with PSO and POs</b>														<b>2.14</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.14</b>
Observation	<b>COs of Strongly related with PSOs and POs</b>		

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி), கருமாதூர் - 625 514.

இளங்கலைத்தமிழ்  
நாட்டார் வழக்காற்றியல்

வகுப்பு : இளங்கலைத்தமிழ்

பகுதி : III Core - 16

பருவம் : ஆறாம் பருவம்

நேரம் : 75 மணிகள்

பாடக்குறியீட்டு எண் : 22UTLD66

மதிப்புப்புள்ளி : 4

**நோக்கங்கள்**

- நாட்டார் வழக்காற்றியலை அறிமுகம் செய்தல்
- நாட்டார் வழக்காற்றினைப் பயன்பாட்டு அடிப்படையில் கற்றல்.
- நாட்டார் வழக்காற்றியலின் கொள்கை,கோட்பாடுகளைக் கற்றறிதல்
- கள ஆய்வின் மூலம் வழக்காறுகளைச் சேகரித்தல்
- நாட்டார் புழங்குபொருட்கள் கலை, கலைத்தொழில்நுட்பம் ஆகியவைகளைப் பயன்பாட்டு நோக்கில் கற்றல்.

**கூறு : 1 நாட்டார் வழக்காற்றியல் : அடிப்படைக் கருத்தாக்கம் (15 மணிநேரம்)**

நாட்டார் வழக்காற்றியல் விளக்கம் - வகைமை- மேலை நாட்டார் வழக்காற்றியலாளர்களின் கருத்தாக்கங்கள்-தமிழ்நாட்டு நாட்டார் வழக்காற்றியலாளர்களின் கருத்தாக்கம்.

**கூறு : 2 நாட்டார் இலக்கியம் (15 மணிநேரம்)**

பாடல்கள்-கதைகள்-கதைப்பாடல்-விடுகதைகள்-பழமொழிகள்-விளையாட்டுகள்

**கூறு : 3 நாட்டார் கலைகள் (15 மணிநேரம்)**

நாட்டார் நிகழ்த்துக்கலைகள் - நாட்டார் நுண்கலைகள்.

**கூறு : 4 நாட்டார் சமயமும் நம்பிக்கையும் (15 மணிநேரம்)**

நாட்டார் தெய்வங்கள்- வழிபாடுகள்- நம்பிக்கைகள்-விழாக்கள்.

**கூறு : 5 நாட்டார் புழங்கு பொருட்கள் (15 மணிநேரம்)**

வீட்டுஉபயோகப்பொருட்கள்- மண்பாண்டங்கள்- பனையோலைப்பொருட்கள்- பாரம்பரியத் தொழில்நுட்பம் - நாட்டுப்புற மருத்துவம்.

கள ஆய்வின் மூலம் நாட்டார் புழங்குபொருட்களைச் சேகரித்தல்

**பாடநூல்:**

1. தே.லுர்து,நாட்டார்வழக்காற்றியல்:சில அடிப்படைகள், நாட்டார் வழக்காற்றியல் ஆய்வு மையம், தூயசவேரியார்கல்லூரி,பாளையங்கோட்டை.2008.

**பார்வை நூல்கள்:**

1. முனைவர் ஆறு.இராமநாதன்,தமிழர் வழிபாட்டு மரபுகள்:நாட்டுப்புறத் தெய்வ வழிபாட்டு ஆய்வு, மெய்யப்பன் பதிப்பகம்,சிதம்பரம்,2006.
2. முனைவர் ஆறு.இராமநாதன்,நாட்டுப்புறவியல் –அறிமுகம், மெய்யப்பன் பதிப்பகம்,சிதம்பரம்.2008
3. அ.இருதயராஜ் சே.ச., வழக்காறு காட்டும் வாழ்வியல், நாட்டார் வழக்காற்றியல் ஆய்வு மையம், தூய சவேரியார் கல்லூரி , பாளையங்கோட்டை, 2014.

**கற்றல் கற்பித்தல் வழிமுறைகள்**

1. களஆய்வு முறை
2. வினாநிரல் முறை
3. மின் வழி பதிவுசெய்தலும் விளக்குதலும் பகுத்தளித்தலும்
4. பின்னூட்டமுறையில் கற்றல் கற்பித்தல்
5. கருத்தாடல் முறை

**கற்றல் கற்பித்தலின் விளைவுகள்**

பாடவிளைவு	கற்றல் விளைவுகள்	மதிப்பீட்டு நிலை
CO1	நாட்டார் வழக்காறுகளை அறிந்துகொள்ளுதல்	K1
CO2	நாட்டார் வழக்காறுகளைத் தற்காலச் சூழலோடு பகுத்தாய்தல்	K3
CO3	பாரம்பரியஅறிவுசார்ந்த திறன்களைக் கண்டறிதல்	KK3
CO4	நாட்டார் வழக்காறுகள் வழியாகச் சமூகத்தை ஒப்புநோக்குதல்.	K3
CO5	நாட்டார் இலக்கியங்கள் வழியாகவும் நாட்டார் புழங்குபொருட்கள் மற்றும் கலை, தொழில் நுட்பங்கள் வாழ்விற்குத் தேவையானவைகளைப் பயன்பாட்டு நோக்கில் புரிந்துகொள்ளல்.	K3

K1- கற்றலின் அறிமுகம்

K2- பகுத்தாய்தல்

K3- திறன்களைக்கண்டறிதல்

K4- ஒப்புநோக்கல்

K5- ஒருங்கிணைந்த மதிப்பீட்டுப் பயன்களின் விளைவுகள்

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	3	2	3	2	2	3	3		2		2	2	27
<b>CO2</b>	3	3	3	2	2	2	3	3		2	2	2	2	29
<b>CO3</b>	2	2	3	2	2	2	3	3	3	2		2	2	28
<b>CO4</b>	2	3	2	2	2	2	3	3	3	2		2	2	28
<b>CO5</b>	2	2	3	1	2	2	3	3		2	2	2	2	26
<b>Grand Total of COs with PSOs and POs</b>														<b>138</b>
<b>Mean Value of COs with PSO and POs</b>														<b>2.33</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of COs with PSOs and POs</b>			<b>2.33</b>
<b>Observation</b>	<b>COs of Strongly related with PSOs and POs</b>		

அருள் ஆனந்தர் கல்லூரி, (தன்னாட்சி),கருமாதூர் -625 514  
இளங்கலைத் தமிழ்  
தமிழர் கிராமியக் கலைகள்

வகுப்பு : பி.ஏ / பி.எஸ்.ஸி பகுதி : Self Learning  
பருவம் : ஆறாம் பருவம் நேரம் :  
பாடக்குறியீடு எண் : 22 UTLSL6 மதிப்புள்ளிகள் : 3

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**நோக்கம்**

1. தமிழக தொன்மையான கிராமப்புறத்தின் கலைகளில் ஒன்றான ஆடற்கலையை அறிதல்
2. கிராமிய நாட்டுப்புற ஆடற்கலையின் வகைமைகளைத் தெரிதல்.
3. தெய்வ நம்பிக்கையோடு கிராமப்புற ஆடற்கலைகளைப் பொருத்திப் பார்த்தல்
4. கிராமப்புற மக்களின் கலையுணர்வை அறிதல்
5. தற்கால ஆடற்கலைகளை தொன்மையான ஆடற்கலையோடு ஒப்பீடு செய்தல்.

**அலகு 1** கிராமிய ஆடல்கள் அறிமுகம்

**அலகு 2** ஆண்கள் ஆட்டம்

**அலகு 3** பெண்கள் ஆட்டம்

**அலகு 4** குழுவினர் ஆட்டம்

**அலகு 5** கிராமப்புற திருவிழாக்களும் ஆடல்களும்

**பாடநூல்**

1. நாட்டுப்புற ஆடல்கள், தமிழ் இணையக் கல்விக்கழகம்

**பார்வைநூல்**

1.நாட்டுப்புறவியல் ஆய்வு

- சு.சக்திவேல்

மாணிக்கவாசகர் பதிப்பகம்

சென்னை

2.தமிழர் நாட்டுப்புற இயல் நூல் - கட்டுரை அடைவ -சு.சண்முகசுந்தரம்

சென்னைப் பல்கலைக்கழகம்

1976

**கற்றல் கற்பித்தலின் விளைவுகள்**

பாடவிளைவு	கற்பித்தல் கற்றல் விளைவுகள்	மதிப்பீட்டு நிலை
CO1	கிராமிய ஆடுற்கலைகளை அறிந்துகொள்ளுதல்	K1
CO2	கிராமிய ஆடற்கலையின் வகைமைகளைக் கண்டறிதல்	K2
CO3	பாரம்பரிய ஆடற்கலைகளை இனம் காணுதல்	K3
CO4	கிராமிய ஆடற்கலையின் மூலம் கலையுணர்வை வளர்த்தல்	K3
CO5	தொன்மையான ஆடற்கலையின் மதிப்பினைப் புரிதல்	K3

K1- கற்றலின் அறிமுகம்

K2- பகுத்தாய்தல்

K3- திறன்களைக்கண்டறிதல்

K4- ஒப்புநோக்கல்

K5- ஒருங்கிணைந்த மதிப்பீட்டுப் பயன்களின் விளைவுகள்

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	2	2	2	3	3	2	2		3	2		2	2	25
CO2	2	3	3	2	2	2	2	3	2	2		2	2	25
CO3	2	2	3	2	2	2	2	3	3	2		2	2	27
CO4	2	3	2	2	2	2	2	3	2	2		2	2	26
CO5	2	2	3	1	2	2	2	3	3	2		2	2	26
<b>Grand Total of COs with PSOs and POs</b>														<b>129</b>
<b>Mean Value of COs with PSO and POs</b>														<b>2.18</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.18</b>
Observation	<b>COs of Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514  
DEPARTMENT OF TAMIL  
VALUE ADDED COURSE

Course Code : Semester : ODD  
Hours : 30

போட்டித் தேர்வுத் தமிழ் - 1

நோக்கம்

1. தமிழ் இலக்கியத் தகவல்களைப் பெறுதல்
2. அரசுப்பணி தொடர்பான பல்வேறு தேர்வுகளை எதிர்கொள்வது.

அலகு 1 மொழி பற்றிய தகவல்கள் (10 மணிகள்)

தனிநிலை மொழி – ஒட்டுநிலை மொழி – உட்பிணைப்பு நிலை மொழி – எழுத்துக்கள் –  
மொழிக்குடும்பம் – திராவிட மொழிக் குடும்பம் – மக்களும் மொழியும் – தமிழ்மொழி

அலகு 2 முச்சங்கத் தகவல்கள் , சங்க இலக்கியங்கள் (10 மணிகள்)

முதற்சங்கம் – இடைச்சங்கம் – கடைச்சங்கம் – சங்கம் இருந்தமைக்கான சான்றுகள் –  
இறையனார் களவியல் உரை பற்றிய செய்திகள் - எட்டுத்தொகை – பத்துப்பாட்டு

அலகு 3 சங்கம் மருவியகால இலக்கியத் தகவல்கள் (10 மணிகள்)

பதினெண்கீழ்க்கணக்கு நூல்கள் முழுவதும் – பிற்கால நீதி நூல்கள் – ஆத்திசூடி-  
கொன்றை வேந்தன் – மூதுரை – நல்வழி – அருங்கலச் செப்பு – அறநெறிச்சாரம் –  
வெற்றிவேற்கை – நீதிநெறி விளக்கம் – நன்னெறி – விவேகசிந்தாமணி – உலகநீதி –  
நீதிநூல் – பெண்மதி மாலை – புதிய ஆத்திசூடிகள்

(முதல் 125 பக்கங்கள்)

பாடநூல்

1. தேவிரா  
தமிழ் இலக்கியத் தகவல்களஞ்சியம்  
சித்ரா பிரிண்ட வேர்ல்டு  
தி.நகர், சென்னை – 17

**கற்றல் கற்பித்தல் வழிமுறைகள்**

- வினா நிரல்
- கலந்துரையாடல்
- காணொலிக் காட்சி முறை
- மாதிரி வினாக்களை பரிசோதித்தல் முறை
- மாணவர்கள் போட்டி தேர்வுக்கானத் தகவல்களை சேகரித்தல்

வ.எண்	கற்றல் விளைவுகள்	புளும்சு மதிப்பீடு
CO1	அரசு போட்டித் தேர்விற்கான உத்தி முறைகள் மற்றும் வழிமுறைகளைப் பெறச் செய்தல்	K1
CO2	பல்வேறு மாதிரி வினாத்தாள்களை அறியச் செய்தல்	K2
CO3	அரசு போட்டித் தேர்விற்கான திறன் பெறச் செய்தல்	K3
CO4	தமிழ் இலக்கண இலக்கிய அடிப்படைகளை கற்றல் வழி பயன்பாட்டு நோக்கிலான விளைவுகளைப் பெறச் செய்தல்	K2, K3
CO5	செய்தித்தாள் மூலம் பொது அறிவு செய்திகளை பெறச் செய்தல்	K3

K1 = தகவல் பெறுதல்,

K2 = புரிதல் பெறுதல்,

K3 = பயன்படுத்துதல்,

K4 = பகுத்தாய்தல்,

K5 = ஒருங்கிணைத்து மதிப்பீடு செய்தல்

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	2	2	2	2	2	1	2	2	2	2	3	2	1	25
<b>CO2</b>	2	2	2	2	3	2	1	3	2	2	2	2	2	27
<b>CO3</b>	2	1	3	2	2	3	2	2	2	3	2	2	3	29
<b>CO4</b>	2	3	2	1	3	2	3	3	1	3	1	2	1	27
<b>CO5</b>	2	3	2	1	1	3	1	2	1	3	1	2	3	25
<b>Grand Total of COs with PSOs and POs</b>														<b>133</b>
<b>Mean Value of Cos with PSO and POs</b>														<b>2.04</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.04
Observation	<b>COs of Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF TAMIL**  
**VALUE ADDED COURSE**

**Course Code** : **Semester** : ODD  
**Hours** : 30

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**கணினிப் பயன்பாட்டுத் தமிழ்**

**நோக்கங்கள்**

- அலுவலகப்பணி, கல்விப்பணி முதலான பணிகளில் தமிழ்வழியில் கணினியைக் கையாளும் திறன் பெறச் செய்தல்.
- கணினியின் மென்பொருள்கள், சமூக வலைதளங்கள், இணையங்களைத் தமிழ் வழியில் பயன்படுத்தச் செய்தல்.
- இணையத்தில் தமிழ்மொழி பெற்றுள்ள செல்வாக்கைக் கண்டறியச் செய்தல்.
- மின்னூல்களைப் பதிவேற்றம் செய்வதற்கும் பதிவிறக்கம் செய்து பயன்படுத்துவதற்குமான வழிமுறைகளைப் பெறச் செய்தல்.
- தமிழ்த் தட்டச்சு வடிவங்களைக் கணினியில் கையாளும் திறனை வளர்த்தல்.
- தமிழ் வழியில் கணினியின் புதிய தொழில் நுட்பங்களைக் கற்றல்.

**அலகு 1**

**(10 மணிகள்)**

**எழுத்துருக்களும் எழுத்துரு மென்பொருள்களும்** : நூலாக்கி அறிமுகமும் அடிப்படைகளும் - படவரைவி அறிமுகமும் பயன்பாடும் - தமிழ்த் தட்டச்சு முறைகள்; - ஒருங்குறி - என்எச்எம் எழுதியின் பயன்பாடு - பாமினி எழுத்துருத் தட்டச்சு முறை - கூகுள் குரல் தட்டச்சு முறை - படத்திலுள்ள எழுத்துகளைத் தட்டச்சு எழுத்துகளாக மாற்றுதல் - எழுத்துரு மாற்றி - என்எச்எம் எழுத்துரு மாற்றி அறிமுகமும் பயன்பாடும்.

**செய்முறைப் பயிற்சி**

நூலாக்கி - வரைகலை மென்பொருள் - ஒருங்குறித் தட்டச்சு முறை - என்.எச்.எம். எழுதி பயன்படுத்தித் தட்டச்சிடுதல் - பாமினி எழுத்துருத் தட்டச்சு முறை - கூகுள் குரல் தட்டச்சு முறை - படத்திலுள்ள எழுத்துகளைத் தட்டச்சு எழுத்துகளாக மாற்றுதல் - என்.எச்.எம். எழுத்துரு மாற்றியைப் பயன்படுத்தித் தமிழ் எழுத்துருக்களை மாற்றுதல்.

## அலகு - 2

(10 மணிகள்)

**இணையத் தொழில் நுட்பங்கள்:** மின்னஞ்சல் - சமூக வலைதளங்கள் - முகநூல்(Face Book), புலனம்(Whatsapp), படவரி , தொலைவரி , கீச்சகம் , வலைப்பதிவு, வலைக்காட்சி(You Tube) கணக்குகள் தொடங்குதலும் பயன்பாடும் - மின்னூல்கள்(E Book) - மின்னிதழ்கள் - அறிமுகமும் பயன்படுத்துதலும். ஏ,ஐ தொழில் நுட்பப் பயன்பாடு.

## அலகு 3

(10 மணிகள்)

**விண்டோஸ் அடிப்படைகள்:** விண்டோஸின் பொருள்கள் - எம்.எஸ். சொல்லாய்வி - ஆவண உருவாக்கம் அறிமுகமும் அடிப்படைகளும்; - எம். எஸ். மின்திரை - எம்.எஸ்.விரிதாள் அறிமுகமும் அடிப்படைகளும் - செய்முறைப் பயிற்சி - எம்.எஸ்.சொல்லாய்வி - மின்திரை - விரிதாள் உருவாக்கம் பயன்பாடு.

## பார்வை நூல்கள்

தமிழ்க்கணினி இணையப்பயன்பாடுகள்

- முனைவர் துரை மணியகண்டன்  
கமலினி பதிப்பகம்,கச்சமங்கலம்,  
தஞ்சாவூர் .

கணினித்தமிழ்

- முனைவர் இல.சுந்தரம்  
விகடன் பிரசுரம், சென்னை.

கன்னித் தமிழும் கணினித்தமிழும்

- இரா.பன்னிருகை வடிவேலன்  
உலகத் தமிழராய்ச்சி நிறுவனம்,  
சென்னை

## கற்பித்தல், கற்றல் முறைகள்

1. விரிவுரை முறை (Chalk and Talk Method)
2. மின்திரை (PPT) வழிக் கற்பித்தல், கற்றல்
3. கணினி ஆய்வகப் (Computer Lab) பயிற்சி வழிக் கற்பித்தல், கற்றல்
4. கலந்துரையாடல் முறையில் கற்றல்

**கற்றலின் விளைவுகள்**

பாடவிளைவு	கற்பித்தல், கற்றல் விளைவுகள்	புள்ளம்ஸ் மதிப்பீடு
CO1	கணினி வரலாறு, செயல்பாடுகளைத் தமிழ் வழித் தெளிதல், புரிதல்	K <sub>1</sub> , K <sub>2</sub>
CO2	கணினி மென்பொருள்களைத் தமிழ் வளர்ச்சிக்குப் பயன்படுத்துதல் பற்றிய தெளிவு	K <sub>2</sub> , K <sub>3</sub>
CO3	எதிர்காலப் பயன்பாட்டிற்குத் தகுந்தாற்போல் மாணவர்கள் கணினியைத் தமிழ் வழியில் பயன்படுத்துதல்	K <sub>3</sub>
CO4	தமிழ்த் தட்டச்சு முறைகளை அறிதலும் பயன்படுத்துதலும்	K <sub>1</sub> , K <sub>3</sub>
CO5	கணினி, இணையதளம், சமூக வலைதளங்களில் தமிழைப் பயன்படுத்துதல், பதிவேற்றங்களைப் பயன்படுத்துதல்	K <sub>3</sub> , K <sub>4</sub>

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	1	3	1	3	3	3	1	1	2	1	2	2	26
CO2	3	1	3	2	3	3	3	1	1	2	2	2	2	28
CO3	3	1	3	2	3	3	3	1	1	3	2	2	2	29
CO4	2	1	3	2	2	2	3	3	3	3	2	2	2	30
CO5	2	2	3	3	3	3	2	2	1	2	1	2	2	28
<b>Grand Total of COs with PSOs and POs</b>														<b>141</b>
<b>Mean Value of COs with PSO and POs</b>														<b>2.16</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.16
Observation	<b>COs of Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514  
DEPARTMENT OF TAMIL  
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Hours : 30

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போட்டித் தேர்வுத்தமிழ் - 2

நோக்கம்

1. தமிழ் இலக்கியத் தகவல்களைப் பெறுதல்
2. அரசுப்பணி தொடர்பான பல்வேறு தேர்வுகளை எதிர்கொள்வது.

அலகு 1 காப்பிய இலக்கியத் தகவல்கள் (10 மணிகள்)

ஐம்பெரும் காப்பியங்கள் – ஐஞ்சிறு காப்பியங்கள் - பெருங்கதை

அலகு 2 சமய இலக்கியத் தகவல்கள் (10 மணிகள்)

சைவமும் தமிழும் – திருஞானசம்பந்தர் – திருநாவுக்கரசர் – சுந்தரர் – மாணிக்கவாசகர் –  
9-ஆம் திருமுறை – 10-ஆம் திருமுறை – 11-ஆம் திருமுறை – 12-ஆம் திருமுறை

அலகு 3 சமய இலக்கியத் தகவல்கள் (10 மணிகள்)

பதினெண் சித்தர்கள் – திருவிளையாடற் புராணம் – கந்தபுராணம் – குமரகுருபரர் –  
இராமலிங்க அடிகள் – தாயுமானவர் – அருணகிரியார் – சிவப்பிரகாசர் – சைவ சித்தாந்த  
சாத்திரங்கள் – ஒட்டக்கூத்தர் – பாம்பன் சுவாமிகள் – சைவ மடங்கள் – வைணவமும்  
தமிழும் – நாலாயிரத் திவ்விய பிரபந்தம் – பன்னிரு ஆழ்வார்கள் – வைணவ உரைகள்  
சமணமும் தமிழும் – பௌத்தமும் தமிழும் .

(மொத்தம் 125 பக்கங்கள்)

## பாடநூல்

### 1. தேவிரா

தமிழ் இலக்கியத் தகவல்களஞ்சியம்

சித்ரா பிரிண்ட வேர்ல்டு

தி.நகர், சென்னை – 17

### கற்றல் கற்பித்தல் வழிமுறைகள்

- வினா நிரல்
- கலந்துரையாடல்
- காணொலிக் காட்சி முறை
- மாதிரி வினாக்களை பரிசோதித்தல் முறை
- மாணவர்கள் போட்டி தேர்வுக்கானத் தகவல்களை சேகரித்தல்

வ.எண்	கற்றல் விளைவுகள்	புளும்சு மதிப்பீடு
CO1	அரசு போட்டித் தேர்விற்கான உத்தி முறைகள் மற்றும் வழிமுறைகளைப் பெறச் செய்தல்	K1
CO2	பல்வேறு மாதிரி வினாத்தாள்களை அறியச் செய்தல்	K2
CO3	அரசு போட்டித் தேர்விற்கான திறன் பெறச் செய்தல்	K3
CO4	தமிழ் இலக்கண இலக்கிய அடிப்படைகளை கற்றல் வழி பயன்பாட்டு நோக்கிலான விளைவுகளைப் பெறச் செய்தல்	K2, K3
CO5	செய்தித்தாள் மூலம் பொது அறிவுச் செய்திகளைப் பெறச் செய்தல்	K3

K1 = தகவல் பெறுதல்,

K2 = புரிதல் பெறுதல்,

K3 = பயன்படுத்துதல்,

K4 = பகுத்தாய்தல்,

K5 = ஒருங்கிணைத்து மதிப்பீடு செய்தல்

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	2	2	2	2	2	1	2	2	2	2	3	2	1	25
<b>CO2</b>	2	2	2	2	3	2	1	3	2	2	2	2	2	27
<b>CO3</b>	2	1	3	2	2	3	2	2	2	3	2	2	3	29
<b>CO4</b>	2	3	2	1	3	2	3	3	1	3	1	2	1	27
<b>CO5</b>	2	3	2	1	1	3	1	2	1	3	1	2	3	25
<b>Grand Total of COs with PSOs and POs</b>														<b>133</b>
<b>Mean Value of Cos with PSO and POs</b>														<b>2.04</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.04</b>
Observation	<b>COs of Strongly related with PSOs and POs</b>		

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**இதழியல்**

**நோக்கங்கள்**

1. இதழியல் குறித்து அறியச் செய்தல்
2. பத்திரிக்கைத் துறையில் மாணவர்களின் பங்கை அறியச் செய்தல்
3. பத்திரிக்கைகள் ஏற்படுத்தும் சமூக மாற்றத்தை உணரச் செய்தல்

**அலகு : 1 இதழியல் தோற்றம், வளர்ச்சி (10 மணிகள்)**

செய்தித்தாளின் தோற்றம் - தமிழக இதழ்கள் - தேசிய இதழ்கள், பிற இதழ்கள், தற்காலத் தமிழ் இதழ்கள் - பழைய இதழ்கள் - பத்திரிக்கைச் சட்டங்கள்

**அலகு : 2 இதழ்களின் கட்டமைப்பும், உருவாக்கமும் (10 மணிகள்)**

புகழ் பெற்ற பத்திரிக்கையாளர்கள் - பத்திரிக்கை கவுன்சில் - இதழ்களின் சுதந்திரம் - செய்தியாளர்கள் - செய்தி சேகரிப்பு - பேட்டி - தலைப்பு - தலையங்கம்

**அலகு : 3 செய்தித்தாளின் அமைப்பும், முறையும் (10 மணிகள்)**

மக்களின் தொடர்புச் சாதனங்கள் - மக்கள் தொடர்புக் கருவிகளில் பத்திரிக்கைகள் - பத்திரிக்கைகளின் பணிகள் - பத்திரிக்கைகளின் பொறுப்புகளும் - கடமைகளும் - ஒழுக்க நெறிகள் - நிறைகுறைகள்

**பாடநூல்**

1. முனைவர் ச.ஈஸ்வரன், முனைவர் இரா.சபாபதி - இதழியல்,பாவை பப்ளிகேஷன்ஸ், - சென்னை

**பார்வை நூல்**

1. மா.பா.குருசாமி, இதழியல்கலை,சக்தி ஃபைன் ஆர்ட்ஸ் - சிவகாசி.
2. கி.ரா.இதழியல், தாமரை பப்ளிகேஷன்ஸ் - சென்னை.

**கற்றல் கற்பித்தல் வழிமுறைகள்**

- ❖ இதழியலின் நோக்கத்தை அறிமுகம் செய்தல்
- ❖ இதழியல் தொடர்பான அடிப்படை உத்திகளை உதாரணங்களுடன் பொறுத்திக்காட்டல்.
- ❖ கலந்துரையாடல் மூலம் கற்பித்தல்.
- ❖ நடைமுறைச் செய்திகளைச் சேகரித்துப் பயிற்சிகொடுத்தல். பத்திரிகை நிறுவனங்களுக்கு அழைத்துச் செல்லல்.

பாட விளைவு	கற்றல் விளைவுகள்	மதிப்பீட்டு நிலை
CO1	இதழியல் குறித்த அறிமுகத்தைப்	K2
CO2	இதழியல் கோட்பாடுகளை அறிமுகம் செய்தல்	K3
CO3	இதழியலில் உத்திகளைக் கண்டறிதல்	K2
CO4	இதழியலின் பயன்பாட்டினை உணர்ந்து ஆராய்தல்	K2
CO5	தற்காலச் சூழலில் இதழியலின் பங்களிப்பினை அறிதல்	K4

K1 = தகவல் பெறுதல்

K2 = புரிதல்பெறுதல்

K3 = பயன்படுத்துதல்

K4 = பகுத்தாய்தல்

K5 = ஒருங்கிணைத்து மதிப்பீடு செய்தல்

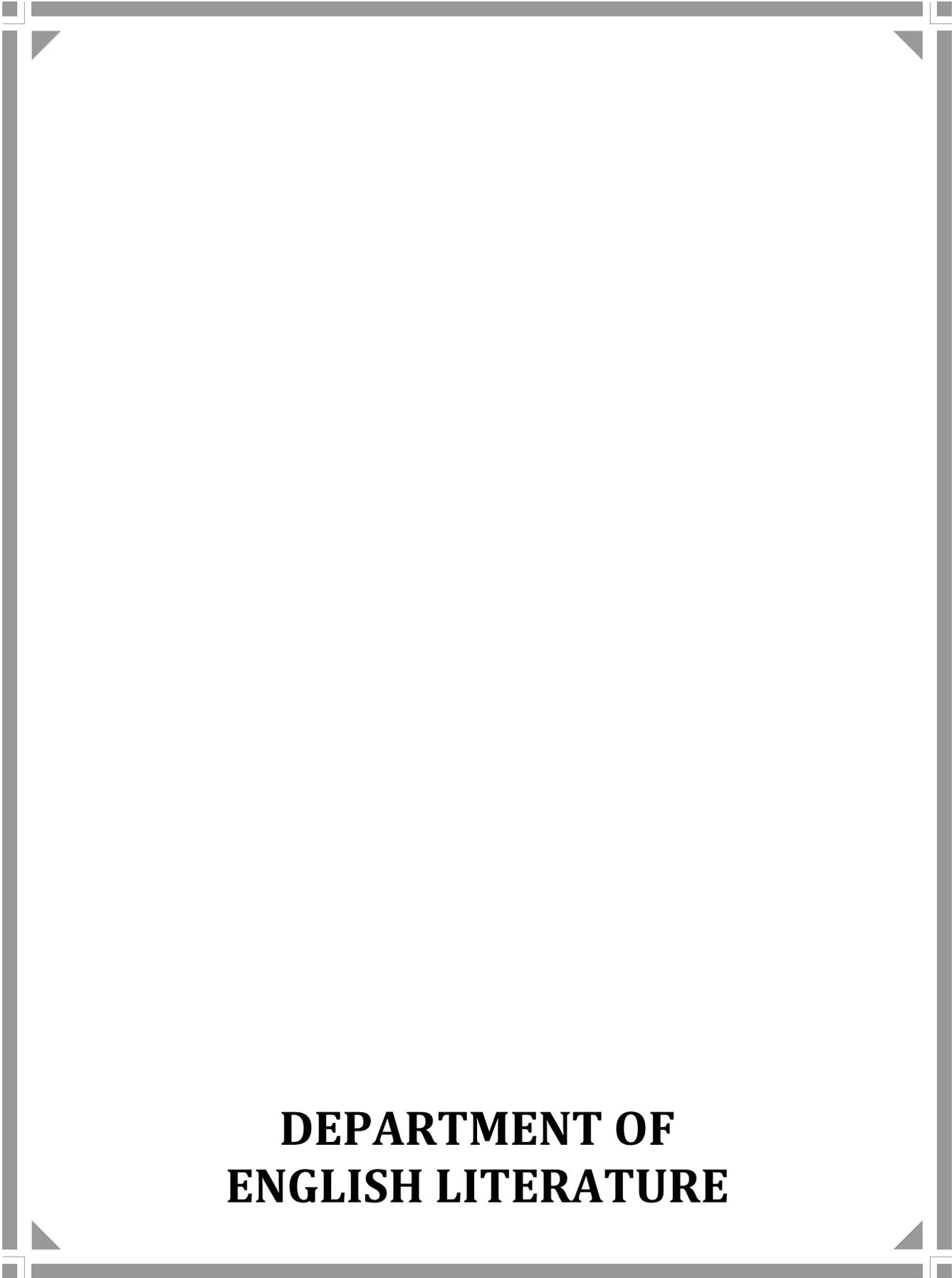
#### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	3	2	2	3	2	2	2	3	2	1	2	30
CO2	3	1	2	3	2	3	2	2	2	3	2	2	2	29
CO3	2	3	2	3	2	2	1	3	2	2	2	2	2	28
CO4	3	2	3	2	3	2	2	2	2	3	2	2	2	30
CO5	3	2	2	3	2	2	2	3	2	3	1	2	2	30
<b>Grand Total of COs with PSOs and POs</b>														<b>147</b>
<b>Mean Value of Cos with PSO and POs</b>														<b>2.26</b>

Strong-3, Medium-2 & Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.26
Observation	<b>COs of Strongly related with PSOs and POs</b>		





**DEPARTMENT OF  
ENGLISH LITERATURE**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.**  
**DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE**  
**PROGRAMME OUTCOMES**

- PO1. Disseminate and demonstrate the knowledge of the concepts in the concerned discipline.
- PO2. Comprehend the essentials of Humanities / arts/ science / commerce subject matters efficiently and think effectively.
- PO3. Develop the spirit of cooperation, team work and leadership qualities with the wide awareness of his social responsibility towards the transformation of the community and to the nation at large.
- PO4. Apply the obtained knowledge for assessing social, economic, legal and cultural issues and the consequent responsibilities relevant to the present situations.
- PO5. Create a favorable ambience for pursuing higher degree in their respective discipline for further application of knowledge and to open vistas for lifelong learning.
- PO6. Acquire analytical reasoning, problem solving skills, technical skills, critical and reflective thinking through modern methods of learning for enhancing employability and entrepreneurship.
- PO7. Communicate the higher educational experience after testing and evaluating to meet the growing demands in the field of science and technology with the unification of multidisciplinary competency.
- PO8. Conceptualize the comprehensive background in humanities/arts/science/physical/mathematical and computing sciences and blend with the ameliorating technology developments and digital literacy for broadening the creativity.

## **Programme Specific Outcome**

**At the end of the course the student of English Language and literature will be able to:**

- Read a variety of texts critically and proficiently to demonstrate in writing or speech, the comprehension, analysis and interpretation of those texts.
- Speak clearly, effectively and appropriately in a public forum for a variety of audience and purpose.
- Demonstrate knowledge and comprehension of major texts and traditions of language and literature written in English as well as their social cultural theoretical and historical contexts.
- Examine knowledge of the major texts and traditions of literature written in English in their social, cultural and historical contexts.
- Analyze instances of the variety of literary forms closely in terms of style, figurative language and convention.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.**  
**DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE (SFC)**  
**B.A. ENGLISH LITERATURE CBCS PATTERN**  
**(Outcome Based Syllabus under CBCS Structure for the Students admitted**  
**from the Academic Year 2022-2023)**  
**COURSE CONTENT**

Part	Sub. Code	Paper	Hours	Credits
<b>SEMESTER – I</b>				
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil/ Hindi/ French	06	04
II	22UENA11/ 22UENB11	English through Prose & Short Story-I (Stream A) English through Prose & Short Story-I (Stream B)	05	04
III	22UELC11	<b>Core 1</b> –British Prose–I	06	05
III	22UELC21	<b>Core 2</b> – English Grammar and Its Usage	06	05
III	22UELA11	<b>Allied 1</b> - Literary Forms and Terms	05	04
IV	22UFCE11	FC – Personality Development	01	01
	22UCSH12	Communication Skills	01	
	22UBRC11	Bridge Course		01
V	22UNCC/NSS/ PED/YRC/ROT /ACF/NCB12	Extension Activities NCC/ NSS/ PHY.EDN/ YRC/ ROTARACT/ AICUF/ NATURE CLUB		
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>SEMESTER – II</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil/ Hindi/ French	06	04
II	22UENA22/ 22UENB22	English through Prose & Poetry – II (Stream A) English through Prose & Poetry – II (Stream B)	05	04
III	22UELC32	<b>Core 3</b> –British Poetry–I	06	05
	22UELC42	<b>Core 4</b> –British Prose–II	06	04
	22UELA22	<b>Allied 2</b> –Social History of England	05	04
IV	22UFCH22	FC- Social Responsibility and Global Citizenship	01	01
	22UCSH12	Communication Skills	01	01
V	22UNCC/NSS/ PED/YRC/RO/ ACF/NCB12	Extension Activities NCC/ NSS/Phy.Edn/ YRC/ ROTARACT/ AICUF/ NATURE CLUB		01
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>SEMESTER – III</b>				
I	22UTAL33/ 22UHNL33/ 22UFNL33/	Tamil / Hindi / French	06	04
II	22UENA33/ 22UENB33	English through Literature – I (Stream A) English through Literature – I (Stream B)	06	04
III	22UELC53	<b>Core 5</b> –Indian Writing in English–I	05	04

	22UELA33	<b>Allied 3</b> –History of English Literature –I	05	04
	22UELE13	<b>Core Elective 1</b> –British Fiction–I	04	03
		<b>Core Elective 1</b> –Short Stories in English Translation – I		
IV	22UELN13	<b>Non-major Elective 1</b> –Business English	03	02
	22UFCE33	FC-Environment Studies	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NCC/ NSS/PHY.EDN/ YRC/ ROTARACT/ AICUF/ NATURE CLUB	-	-
	22UARE14	ARISE	-	-
		<b>Total</b>	<b>30</b>	<b>22</b>
<b>SEMESTER – IV</b>				
I	22UTAL44/ 22UHNL44/ 22UFNL44	Tamil / Hindi / French	06	04
II	22UENA44/ 22UENB44	English through Literature – II (Stream A) English through Literature – II (Stream B)	06	04
III	22UELC64	<b>Core 6</b> – Indian Writing in English–II	05	05
	22UELA44	<b>Allied 4</b> –History of English Literature-II	05	04
	22UELE24	<b>Core Elective 2</b> –British Fiction–II	04	03
<b>Core Elective 2</b> –Short Stories in English Translation – II				
IV	22UELN24	<b>Non-major Elective -2</b>	03	02
		Creative Writing in English		
	22UELM24	<b>Non-Major Elective 2</b>		
		English for Employability		
	22UFCH44	FC –Religious Literacy and Peace Ethics	01	01
	22UINT15	Internship	-	-
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NSS/ NCC/ PHY.EDN/ YRC/ ROTARACT/ AICUF/ NATURE CLUB		01
	22UARE14	ARISE		01
		<b>Total</b>	<b>30</b>	<b>25</b>
<b>SEMESTER – V</b>				
III	22UELC75	<b>Core – 7</b> British Drama – I	05	05
	22UELC85	<b>Core– 8</b> American Literature	06	04
	22UELC95	<b>Core– 9</b> Shakespeare	04	04
	22UELD05	<b>Core– 10</b> British Poetry–II	06	04
	22UELD15	<b>Core– 11</b> English Phonetics and Phonology	04	04
IV	22USBZ15	<b>Skill based Elective –I</b> Fundamentals of Computer, Internet and Office Automation	01	01
	22USBY15	Fundamentals of Computer, Internet and Office Automation – Practical	02	01
	22USS116	Soft Skills	02	
	22UINT15	Internship	-	01

		<b>Total</b>	<b>30</b>	<b>24</b>
<b>SEMESTER – VI</b>				
III	22UELD26	<b>Core – 12</b> British Drama- II	05	04
	22UELD36	<b>Core– 13</b> Literary Criticism and Theory	06	05
	22UELD46	<b>Core– 14</b> Women’s Writing	04	03
	22UELD56	<b>Core– 15</b> New Literatures	06	05
	22UELD66	<b>Core– 16</b> Media Studies	04	04
IV	22USBZ26	<b>Skill based Elective-II</b> –Web Design	01	01
	22USBY26	Web Design – Practical	02	01
	22USSI16	Soft Skills	02	02
		<b>Total</b>	<b>30</b>	<b>25</b>

Semester	I	II	III	IV	V	VI	Total
Credits	24	24	22	25	24	25	144*

**\* 144 credits from 2017-18 onwards; 142 credits up to 2016-17 batches.**

Part – I	16
Part – II	16
Part – III	
Core	74
Allied	16
Core	
Electives	06
<b>Total Credits</b>	<b>96</b>
Part – IV	
Non-Major Electives	04
Skills Based Electives	04
Foundation Course	04
<b>Total Credits</b>	<b>12</b>
Part – V	02
Bridge	
Course	01
Arise	01

#### Self-Learning Courses

Semester	Sub. Code	Title	Credits
III	22UELSL3	Indian Fiction	3
IV	22UELSL4	Indian Short Stories	3
V	22UELSL5	British Drama	3
VI	22UELSL6	Indian Drama	3

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514 MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE PAPER VII – BRITISH DRAMA – I  
(THE RENAISSANCE TO THE RESTORATION PERIOD :1500 - 1700)  
(Outcome Based Syllabus under CBCS Structure for the Students admitted  
from the Academic Year 2022-2023)

Class : III B.A. English Literature Part : III Core - 7  
Semester : V Hours : 75  
Subject Code : 22UELC75 Credit : 5

**1. Course Educational Objectives:**

**Upon completion of the course the students will be able to:**

- familiarize the tragical elements of Elizabethan drama.
- explain the comical traces of the play in the reign of James I.
- analyze the components of Jacobean revenge tragedy.
- acquaint the features of Restoration drama.
- acknowledge the realistic and satirical elements of comedy in the late seventeenth century.

**UNIT– I (Detailed) (15 Hours)**

Christopher Marlowe : *Doctor Faustus*

**UNIT– II (Non-Detailed) (15 Hours)**

Ben Jonson : *Every Man in his Humour*

**UNIT– III (Detailed) (15 Hours)**

John Webster : *The Duchess of Malfi*

**UNIT– IV (Non-Detailed) (15 Hours)**

John Dryden : *All for Love*

**UNIT– V (Non-Detailed) (15 Hours)**

Richard Brinsley Sheridan : *The School for Scandal*

**2. Books for Study:**

Dryden, John. *All for Love*. B K Publications Private Limited, 2014. Print.

Jonson, Ben. *Every Man in his Humour*. Double 9 books, 2023. Print.

Marlowe, Christopher. *The Tragical History of Doctor Faustus in the Complete Play*. New York: Penguin, 1969. Print.

Sheridan, Richard Brinsley. *The School for Scandal*. New Mermaids, Cook ed. London: A & C black, 1991. Print.

Webster, John. *The Duchess of Malfi*. Ed. F.L. Lucas. London: Chatto & Windus, 1958. Print.

**3. Books for Reference:**

Dawson S. W. *Drama and the Dramatic*. Routledge. New York. 2018. Print.

Marlowe, Christopher. *The Tragical History of Doctor Faustus in the Complete Play*. New York: Penguin, 1969. Print.

#### 4. Teaching Learning Methods:

- Chalk and talk
- Seminar
- Quiz
- Assignments
- Group discussion

#### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	familiarize the nuances of tragical elements of drama in the Elizabethan period.	K2
CO2	understand the comical traces in the British Literature.	K2
CO3	analyze the components of Jacobean revenge tragedy.	K3
CO4	distinguish from the features of Restoration Comedy to the other plays in the realm of British Literature.	K4
CO5	classify the different varieties of comedy in the late seventeenth century.	K4

K1, Knowledge K2- Understanding K3- Applications K4 – Analyze K5- Synthesis

#### 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	3	3	3	3	3	3	3	3	3	3			33
CO2	3	3	2	2	2	3	3	2	2	3	2			27
CO3	3	3	2	2	2	3	3	3	2	3	2			28
CO4	3	3	3	2	2	3	3	3	2	3	3			30
CO5	3	3	2	2	2	3	3	3	2	3	3			29
Grand total of COs with PSOs and POs														146
Mean value of COs with PSOs and POs= 146/30														3.0

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	low	Medium	Strong
Mean value of COs with PSOs and POs			3.0
Observation	COs of British Drama – Strongly related with PSOs and POs		

\*: S-Strong; M-Medium; L-Low

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE PAPER VIII – AMERICAN LITERATURE  
(Outcome Based Syllabus under CBCS Structure for the Students admitted  
from the Academic Year 2022-2023)

Class : III B.A. English Literature  
Semester : V  
Subject Code: 22UEL85

Part : III Core- 8  
Hours : 90  
Credit : 4

**1. Course Educational Objectives:**

**Upon completion of the course the students will be able to:**

- identify various themes of American Literature through poetry.
- infer the literary sensibility of American prose.
- discover the spirit of the American Dream through prose.
- appraise the dramatic style of American dramatist
- estimate the emerging trends in American fiction.

**UNIT– I POETRY (Detailed) (18 Hours)**

Robert Frost	:	“Mending Wall”
Emily Dickinson	:	“Hope is the thing with feathers”
Walt Whitman	:	“I Sit and Look Out”
Maya Angelou	:	“Still I Rise”
Adrienne Rich	:	“Storm Warnings”

**UNIT– II PROSE (Non-Detailed) (18 Hours)**

Emerson	:	“Self-Reliance”
Henry David Thoreau	:	“A Battle of Ants” (Excerpt from Walden Chapter12)

**UNIT – III DRAMA (Detailed) (18 Hours)**

Arthur Miller	:	<i>Death of a Salesman</i>
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**UNIT– IV SHORT STORIES (Non-Detailed) (18 Hours)**

T.S. Arthur	:	“An Angel in Disguise”
Edgar Allan Poe	:	“The Cask of Amontillado”
F. Scot Fitzgerald	:	“The Bridal Party”

**UNIT– V FICTION (18 Hours)**

Harper Lee	:	<i>To Kill a Mockingbird</i>
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**2. Books for Study:**

Kelly J. Mays, Ed. *The Norton Introduction to Literature*, 14th ed., W. W. Norton & Company, 2006. Print.

Thoreau, Henry David, *Walden*, Maple Press, 2013. Print.

Lee, Harper. *To Kill a Mockingbird*. New York: Harper Perennial Modern Classics, 2006. Print.

Miller, Arthur. *Death of a Salesman*. Penguin Classics, 2000. Print.

Neill, Eugene O'. *The Emperor Jones*. Dover Publications, New York, 1997. Print.

Websites: <https://gutenberg.net.au/fsf/THE-BRIDAL-PARTY.html>

### 3. Books for Reference:

Charles, F. Jr & Brodtkorb, P. Jr. *Interpretations of American Literature*. OUP, 1959. Print.  
Forester, Normannet al. *Introduction to American Poetry and Prose*. Houghouto Miffin, New York, 1971. Print.

### 4. Teaching Learning Methods:

- Chalk and talk
- Power Point Presentations
- Seminar
- Quiz
- Assignments
- Group discussion

### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	describe the themes of American Literature.	K2
CO2	examine the literary sensibility of American prose.	K3
CO3	summarize the essence of American Dream.	K3
CO4	analyze the dramatic style of American dramatist.	K4
CO5	examine and Analyze the emerging trends in American fiction.	K4

### 6. Mapping Course Outcome with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	3	2	3	3	3	3	3	2	3		2	32
CO2	3	2	3	2	3	3	2	3	2	2	3		1	29
CO3	3	3	3	2	3	3	3	2	2	2	3		2	31
CO4	3	2	3	2	2	3	2	3	2	2	2		2	28
CO5	3	2	3	2	3	3	3	3	2	2	3		2	31
Grand total of Cos with PSOs and POs														151
Mean value of Cos with PSOs and POs= 151/60														2.5

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.5
Observation	COs of American Literature– Strongly related with PSOs and POs		

\*: S-Strong-3; M-Medium-2; L-Low-1

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE PAPER IX – SHAKESPEARE  
(Outcome Based Syllabus under CBCS Structure for students admitted  
from the Academic Year 2022 - 2023)

Class : III B.A. English Literature  
Semester : V  
Subject Code: 22UELC95

Part : III Core - 9  
Hours : 60  
Credit : 4

**1. Course Educational Objectives:**

**Upon completion of the Course the students will be able to:**

- appreciate the moral and philosophical significance of Shakespeare's tragedy
- identify the distinctive features of Shakespearean techniques in Romantic Comedies
- reflect the social, historical and cultural contexts of Roman Empire
- explain the roots of the Shakespearean sonnet and the origins of Elizabethan drama
- illuminate the characters' actions through linguistic and dramatic mechanisms

**UNIT– I (Detailed) (12 Hours)**  
*King Lear*

**UNIT– II (Non-Detailed) (12 Hours)**  
*Twelfth Night*

**UNIT– III (Detailed) (12 Hours)**  
*Henry V*

**UNIT– IV (General Shakespeare) (12 Hours)**  
Elizabethan Theatre & Audience  
Shakespeare's Sonnets & Aside  
Shakespeare's Supernatural Elements

**UNIT– V (General Shakespeare) (12 Hours)**  
Shakespeare's Villains  
Shakespeare's Fools & Clowns  
Shakespeare's Heroines

**2. Books for Study:**

Shakespeare, William. *King Lear*. Wordsworth Editions, 1994. Print.  
Shakespeare, William. *Twelfth Night*. London: Penguin, 2015. Print.  
Shakespeare, William. *Henry V*. Gyan Publishing House, 2022. Print.

**3. Books for Reference:**

Bradley, A. C. *Shakespearean Tragedy*. New Delhi: Atlantic, 2019. Print.

Charlton, H. B. *Shakespearean Comedy*. New Delhi: Routledge, 2013. Print.

Tillyard, E. M. W. *Shakespeare's Last Plays*. London: Continuum International Publishing Group Ltd. 1983. Print.

#### 4. Teaching and learning methods:

- o Chalk and talk
- o Power Point Presentations
- o Quiz
- o Memorizing
- o Recitation
- o Assignment
- o Movie
- o Enactment of few Scenes from the Plays
- o Role Play

#### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	define the 'hamartia' through tragedy.	K2
CO2	describe the Shakespearean techniques in Romantic Comedies.	K2
CO3	classify the Roman and Egyptian histories through Shakespearean play.	K3
CO4	differentiate various dramatic techniques and sonnets found in Shakespearean world.	K4
CO5	evaluate the Shakespearean characters from his plays.	K5

**K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis**

#### 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs With POs
CO1	3	2	3	2	3	3	3	3	3	2	3		2	32
CO2	3	2	3	2	3	3	2	3	2	2	3		1	29
CO3	3	3	3	2	3	3	3	2	2	2	3		2	31
CO4	3	2	3	2	2	3	2	3	2	2	2		2	28
CO5	3	2	3	2	3	3	3	3	2	2	3		2	31
Grand total of COs with PSOs and POs														151
Mean value of COs with PSOs and POs= 151/60														2.5

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and POs			2.5
Observation	COs of Shakespeare– Strongly related with PSOs and POs		

\*: S-Strong - 3; M-Medium - 2; L-Low - 1

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE**

**CORE PAPER X – BRITISH POETRY – II  
(AGE OF TENNYSON TO MODERN AGE)**

**(Outcome Based Syllabus under CBCS Structure for the Students admitted  
from the Academic Year 2022-2023 onwards)**

Class : III B.A. English Literature Part : III Core -  
10 Semester : V  
Hours : 90  
Sub. Code : 22UELD05 Credit : 4

**1. Course Educational Objectives:**

**Upon completion of the Course the students will be able to:**

- familiarize with the English poetry from Age of Tennyson to Modern Age.
- understand the nuances of poetry and the culture of Britain in the Restoration period.
- create critical understanding of the Sentimental and delightful poetry.
- analyze the artistic use of language employed by the poets prevailed in the 19<sup>th</sup> century.
- compare and Interpret Satirical elegy and Animal Poem.

**UNIT– I (Detailed) (18 Hours)**

Alfred Tennyson : “The Lotos Eaters”  
Robert Browning : “My Last Duchess”  
Matthew Arnold : “Immortality”

**UNIT– II (Non-Detailed) (18 Hours)**

Elizabeth Barrett Browning : “Cry of the Children”  
Christiana Rossetti : “Dream Land”  
William Morris : “Love is Enough”

**UNIT– III (Detailed) (18 Hours)**

Gerald Manley Hopkins : “Wreck of the Deutschland”  
William Butler Yeats : “The Second Coming”  
Wilfred Owen : “Anthem for Doomed Youth”

**UNIT– IV (Non-Detailed) (18 Hours)**

John Masefield : “Sea-Fever”  
Rupert Brooks : “The Dead”  
T.S Eliot : “Journey of the Magi”

**UNIT– V (Non-Detailed) (18 Hours)**

W.H. Auden : “The Unknown Citizen”  
Ted Hughes : “Thought Fox”  
Seamus Heaney : “Digging”

## 2. Books for Study:

Green, David. *The Winged Word*. New Delhi: Macmillan, 1974. Print.

Roberts, Michael. *The Faber Book of Modern Verse*. ed. London: Faber and Faber, 1936. Print.

## 3. Book for Reference:

Leavis, F. R. *New Bearings in English Poetry*. London: Chatto & Windus, 1950. Print.

## 4. Teaching and learning methods:

- Chalk and talk
- Power Point Presentations
- Seminar
- Brain storming
- Quiz
- Assignments
- Group discussion

## 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	identify English poetry from Age of Tennyson to Modern Age.	K2
CO2	recall and Summarize the Poetry of the Restoration period.	K3
CO3	critically understand the sentimental and delightful poetry.	K3
CO4	analyze Satirical elegy and Animal Poem.	K3
CO5	compare and Interpret Satirical elegy and Animal Poem.	K4

K1, Knowledge K2- Understanding K3- Applications K4 – Analyze K5- Synthesis

## 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	3	2	3	3	3	1	2	2	2		1	27
CO2	3	3	3	2	3	3	3	1	2	2	2		1	28
CO3	3	3	2	2	3	3	3	2	3	2	2		2	30
CO4	3	2	3	2	3	3	3	2	2	2	2		1	28
CO5	3	3	2	2	3	3	3	2	2	2	2		2	29
Grand total of COs with PSOs and Pos														24
Mean value of COs with PSOs and POs= 142/60														2.3

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.3
Observation	COs of British Poetry II– Strongly related with PSOs and POs		

\*: S-Strong; M-Medium; L-Low

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE**

**CORE PAPER: XI – ENGLISH PHONETICS AND PHONOLOGY  
(Outcome Based Syllabus under CBCS Structure for students admitted  
from the Academic Year 2022 - 2023)**

Class	: III B.A. English Literature	Part	: III Core –
11			
Semester	: V	Hours	: 60
Sub. Code	: 22UELD15	Credit	: 4

**1. Course Educational Objectives:**

**Upon completion of the Course the students will be able to:**

- explain the basic concepts of phonetics and phonology.
- identify and transcribe speech sounds using IPA symbols.
- pronounce the English Sounds with appropriate pronunciation.
- apply the syllables and consonant clusters in everyday speech.
- emulate the pronunciation of the native speakers with clarity.

**UNIT- I INTRODUCTION TO PHONETICS (12 Hours)**

Components of Linguistics  
Phonetics: The Articulation of Speech Sounds

**UNIT- II CONSONANTS (12 Hours)**

The air-stream Mechanism  
State of the glottis  
Position of soft palate  
Place of articulation  
Manner of articulation  
Description of consonant phonemes

**UNIT- III VOWELS (12 Hours)**

Three Criteria for classifying Vowels  
Difference between consonants and vowels  
Classification of vowels: Pure Vowels and Diphthongs  
Triphthongs

**UNIT- IV PHONOLOGY (12 Hours)**

Definition to Phonology  
Allophones  
Syllables  
Consonant Clusters

**UNIT- V WORD STRESS AND PRONUNCIATION PRACTICE (12 Hours)**

Stress in simple and compound words  
Word Accent  
Intonation  
Practice in Phonetic transcription (Words and Sentences)

**2. Book for Study:**

Balasubramanian, T. *A Textbook of English Phonetics for Indian Students*. New Delhi: Macmillan, 1997.  
Print.

**3. Books for Reference:**

Bansal, R. K. and J. B. Harrison. *Spoken English for Indian Students*. Madras: Orient Longman, 1972. Print.

Roach, Peter. *English Phonetics and Phonology*. Cambridge: Cambridge University, 1991. Print

**4. Teaching and learning methods:**

- ICT usage
- Inductive method
- Flipped classroom
- Kinesthetic learning
- Voice recording
- Task Based learning
- Creative assignments

**5. Course Outcome: Upon completion of the Course the student is able to:**

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	associate the fundamental concepts sound system.	K2
CO2	express and transcribe IPA symbols.	K2
CO3	exercise the English Sounds with proper pronunciation.	K3
CO4	figure out the syllables and consonant clusters in everyday speech.	K4
CO5	prescribe the pronunciation of the native speakers with clarity.	K5

**K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis**

**6. Mapping Course Outcome with PSO and PO.**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	3	2	1	2	3	3		2	2			2	23
CO2	3	3	2	1	1	3	3		2	2			2	22
CO3	3	3	2	1	2	3	3		2	2			2	23
CO4	3	3	2	1	1	3	3		2	2			1	21
CO5	3	3	2	1	1	3	3		2	3			1	22
Grand total of COs with PSOs and Pos														63
Mean value of COs with PSOs and POs= 111/50														2.2

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.2
Observation	COs of English Phonetics and Phonology – Strongly related with PSOs and POs		

\*: S-Strong; M-Medium; L-Low

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR– 625 514, MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE**

**SELF LEARNING COURSE III – BRITISH DRAMA  
(Outcome Based Syllabus under CBCS Structure for the Students admitted  
from the Academic Year 2022-2023)**

Class	: III B.A. English Literature	Part	: SLC
Semester	: V	Hours	:
Subject Code	: 22UELSL5	Credit	: 3

**1. Course Educational Objectives:**

**Upon completion of the course the students will be able to:**

- familiarize the learners with significant play wrights of English Literature.
- enrich the learners with the splendour of the language to enhance employability.
- offer a detailed understanding of twentieth century British plays.
- examine the unique difference in the theme, characterization and stylistic features of British Drama.
- enable the learners to read and interpret the British plays.

**UNIT– I**

Oscar Wilde : *Lady Windermere’s Fan*

**UNIT– II**

George Bernard Shaw : *Pygmalion*

**UNIT – III**

John Galsworthy : *Silver Box*

**UNIT – IV**

Harold Pinter : *The Birthday Party*

**UNIT – V**

Edward Albee : *Who is Afraid of Virginia Woolf?*

**2. Books for Study:**

Albee, Edward. *Who is Afraid of Virginia Woolf?* New York: Scribner Classics, 2003. Print.  
Galsworthy, John. *Silver Box*. New Delhi: Sagwan Press, 2019. Print.  
Pinter, Harold. *The Home Coming*. New York: Grove Press, 1966. Print.  
Shaw, George Bernard. *Arms and the Man*. New Delhi: Fingerprint Publishing, 2016. Print.  
Wilde, Oscar. *Lady Windermere’s Fan*. Noida: Maple Press, 2011. Print.

**3. Book for Reference:**

Priestly, J. B. *The Art of the Dramatist*. London: Oberon Books, 2016. Print.

**4. Teaching and learning methods:**

- Chalk and talk
- Power Point Presentations
- Seminar
- Video clippings
- Brain storming

- Quiz
- Assignments
- Group discussion
- Audio book
- Role Plays

**5. Course Outcome: Upon completion of the Course the student is able to:**

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	recall and relish British dramas and fathom the depth of knowledge inherent within.	K1
CO2	understand vocabulary and develop the power of expression to speak and write with clarity.	K2
CO3	relate the social, economic and political background of England.	K3
CO4	appreciate the moral, religious and aesthetics components of the prescribed texts.	K4
CO5	interpret and criticise major English plays.	K5

**K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis**

**6. Mapping Course Outcome with PSO and PO**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	3	2	3	3	2	3	3	2	2		2	30
CO2	3	2	3	3	3	3	3	3	3	2	2		2	32
CO3	3	3	3	2	3	3	2	3	3	2	2		2	31
CO4	3	1	3	2	3	3	2	3	3	2	2		2	29
CO5	3	2	3	2	3	3	2	3	3	2	2		2	28
Grand total of COs with PSOs and Pos														150
Mean value of COs with PSOs and POs= 150/60														2.5

\*: S-Strong; M-Medium; L-Low

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.5
Observation	COs of British Drama– Strongly related with PSOs and POs		

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DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE XII – BRITISH DRAMA – II  
(VICTORIAN TO MODERN PERIOD)

(Outcome Based Syllabus under CBCS Structure for the Students admitted  
from the Academic Year 2022-2023 onwards)

Class : III B.A. English Literature Part : III Core:  
12  
Semester : VI Hours : 75  
Subject Code : 22UELD26 Credits: 4

**1. Course Educational Objectives:**

**Upon completion of the Course the students will be able to:**

- identify the elements of British Drama of the Modern Period.
- discuss the dramatic techniques in British Literature.
- examine the role of religion in modern society.
- appraise the elements of absurd plays.
- develop the skills of reading and interpreting drama.

<b>UNIT– I</b>	<b>(Detailed)</b>		<b>(15 Hours)</b>
	Percy Bysshe Shelley	:	<i>The Cenci</i>
<b>UNIT– II</b>	<b>(Non-Detailed)</b>		<b>(15 Hours)</b>
	Oscar Wilde	:	<i>The Importance of Being Earnest</i>
<b>UNIT– III</b>	<b>(Detailed)</b>		<b>(15 Hours)</b>
	George Bernard Shaw	:	<i>Arms and the Man</i>
<b>UNIT IV</b>	<b>(Non-Detailed)</b>		<b>(15 Hours)</b>
	Samuel Beckett	:	<i>Waiting for Godot</i>
<b>UNIT– V</b>	<b>(Non-Detailed)</b>		<b>(15 Hours)</b>
	John Osborne	:	<i>Look Back in Anger</i>

**2. Books for Study:**

Beckett, Samuel. *Waiting for Godot*. Chennai: Pearson Education, 2016. Print.  
Osborne, John. *Look Back in Anger*. New Delhi: Worldview Publication, 2013. Print.  
Shaw, George Bernard. *Arms and the Man*. Noida: Mapple Classics, 2013. Print.  
Shelley, Percy Bysshe. *The Cenci: A Tragedy in Five acts*. Edited by C. and J Olliver, 1819.  
Wilde, Oscar. *The Importance of Being Earnest*. Noida: Fingerprint Publishing, 2004. Print.

**3. Books for Reference:**

Priestly, J. B. *The Art of the Dramatist*. London: Oberon Books, 2016. Print.  
Elsom, J. *Post War British Theatre*. London: Routledge Revivals, 2016. Print.

#### 4. Teaching Learning Methods:

- Chalk and Talk
- ICT usage
- Practical Sessions
- Creative assignments
- Group discussion

#### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	define the basic elements of British Drama.	K2
CO2	describe the major developments in British Drama.	K2
CO3	survey the cardinal role of religion in the present context.	K4
CO4	illustrate the functional elements in the theatre of the absurd.	K4
CO5	organize the skills of reading and interpreting drama.	K4

K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis

#### 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	3	2	3	3	3	1	2	2	2		1	30
CO2	3	3	3	2	3	3	3	1	2	2	2		1	32
CO3	3	3	2	2	3	3	3	2	3	2	2		2	31
CO4	3	2	3	2	3	3	3	2	2	2	2		1	29
CO5	3	3	2	2	3	3	3	2	2	2	2		1	27
Grand total of COs with PSOs and Pos														149
Mean value of COs with PSOs and POs= 149/60														2.4

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs=			2.4
Observation	COs of British Drama II – Strongly related with PSOs and POs		

\*: S-Strong; M-Medium; L-Low

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE PAPER XIII – LITERARY CRITICISM AND THEORY  
(PLATO TO THE MODERN TIMES)  
(Outcome Based Syllabus under CBCS Structure for students admitted  
from the Academic Year 2022 - 2023)

Class : III B.A. English Literature Part : III Core-13  
Semester : VI Hours : 90  
Subject Code: 22UELD36 Credit : 5

**1. Course Educational Objectives:**

**Upon completion of the Course the students will be able to:**

- understand and meditate the Western philosophy of the Greek masters.
- understand the history of English Literary Criticism.
- understand and interpret the critical faculty of critics of various Ages.
- weigh and critique the critical and theoretical nuances of both the language and society-based theories.
- Understand and apply the literary theories into the work of art and analyse them.

<b>UNIT– I</b>	<b>(18 Hours)</b>
Introduction to Literary Criticism -The Art of Criticism - Limitations of Criticism - Three Forms (Legislative Criticism, Aesthetic Criticism and Descriptive Criticism) Plato Aristotle	
<b>UNIT– II</b>	<b>(18 Hours)</b>
Sir Philip Sidney John Dryden Dr. Johnson	
<b>UNIT– III</b>	<b>(18 Hours)</b>
William Wordsworth S. T. Coleridge	
<b>UNIT– IV</b>	<b>(18 Hours)</b>
Matthew Arnold T. S. Eliot I. A. Richards	
<b>UNIT– V</b>	<b>(18 Hours)</b>
Introduction to Literary Theory Marxism - Feminism	

**2. Books for Study:**

Prasad, B. *An Introduction to English Criticism*. New Delhi: Trinity Publishers, 1991. Print.  
Barry, Peter. *Beginning Theory*. London: Manchester University Press, 3<sup>rd</sup> edition, 2009. Print.

### 3. Books for Reference:

Habib. M. A. R. *Literary Criticism: An Introduction*. New Delhi: Wiley India, 2012. Print.  
Wimsatt, W. K and Cleanth Brooks. *Literary Criticism: A History*. New York: Routledge, 1957. Print.

### 4. Teaching and learning methods:

- Chalk and talk
- Lecturing
- Power Point Presentations
- Quiz
- Assignment

### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	characterize the Western philosophy of the Greek masters.	K2
CO2	defend the history of English Literary Criticism.	K2
CO3	relate and interpret the critical faculty of critics of various Ages.	K3
CO4	optimize the critical and theoretical nuances of both the language and society-based theories.	K4
CO5	relate literary theories into the work of art.	K4

K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis

### 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	3	3	3	3	3		3	2	3		2	30
CO2	3	2	3	2	3	3	3		3	3	3		1	29
CO3	3	2	3	3	3	3	3		3	2	3		1	29
CO4	3	2	3	2	3	3	3		3	2	3		1	28
CO5	3	2	3	2	3	3	3		3	2	1		1	26
Grand total of COs with PSOs and POs														142
Mean value of COs with PSOs and POs= 142/55														2.5

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.5
Observation	COs of Literary Criticism and Theory– strongly related with PSOs and POs		

\*: S-Strong-3, M-Medium-2, L-Low-1.

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DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE XIV – WOMEN'S WRITING

(Outcome Based Syllabus under CBCS Structure for students admitted  
from the Academic Year 2022 - 2023)

Class	: III B.A. English Literature	Part	: III Core – 14
Semester	: VI	Hours	: 60
Sub. Code	: 22UELD46	Credit	: 3

**1. Course Educational Objectives:**

Upon the completion of the course the students will be able to:

- identify and Recognize women poets of different nationalities.
- appreciate the feminine ethics against the historical, social and cultural context.
- analyze the treatment of themes and the dramatic technique in the writing of a playwright and apply the theatrical techniques in real time scenario.
- solve the various aspects of socio-cultural issues leading to gender issues.
- evaluate the literary work from the perspective of gender.

**UNIT – I POETRY (Detailed) (12 Hours)**

Amrita Pritam	: “Empty Space”
Gweldolyn Brooks	: “The Mother”
Maya Angelou	: “Still I Rise”
Anne Sexton	: “Her Kind”

**UNIT – II PROSE (Non-Detailed) (12 Hours)**

Mary Wollstonecraft	: “The Nursery” ( <i>Thoughts on the Education of Daughters</i> )
Toni Morrison	: “The Bird in Our Hand: Is It Living or Dead?” (Nobel Prize Acceptance Speech)

**UNIT– III DRAMA (Detailed) (12 Hours)**

Lorraine Hansberry	: <i>A Raisin in the Sun</i>
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**UNIT– IV SHORT STORY (Non-Detailed) (12 Hours)**

Dorris Lessing	: “To Room Nineteen”
Joyce Carol Oates	: “Where Are You Going, Where Have You Been?”

**UNIT– V FICTION (Non-Detailed) (12 Hours)**

Mahasweta Devi	: <i>Mother of 1084</i>
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**2. Books for Study:**

Wollstonecraft, Mary. *Thoughts on the Education of Daughters*. London: J. Johnson, 1787. Print.

Hansberry, Lorraine. 1997. *A Raisin in the Sun*. Modern Library. New York, NY: Random House. Print.

Devi, Mahasweta. *Mother of 1084*. Kolkata: Karuna Prakashani, 1974. Print.

Beauvoir, Simon De. *The Second Sex*. Paris: Gallimard, 1949. Print.

Oates, Joyce Carol. *Where Are You Going, Where Have You Been?* New Brunswick: Rutgers University, Press, 1994. Print.

### 3. Books for Reference:

Humm, Maggie. *Feminist Criticism: Women as Contemporary Critics*. Brighton, England: Penguin Publication, 1986. Print.

Showalter, Elaine. *Essays on Women, Literature and Theory*. Ed. New York: Pantheon Books, 1985. Print.

### 4. Teaching and Learning Methods:

- Chalk and talk
- Lecturing
- Power Point Presentations
- Quiz
- Assignment

### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	acquaint women poets of different nationalities through the study of selected poems.	K2
CO2	appreciation of women's writing emerging out of political, social, and cultural conflicts.	K2
CO3	relate the theatrical techniques in the writing of a playwright apply and apply them in real time scenario.	K3
CO4	analyse thematically a range of women's writing leading to gender issues.	K4
CO5	critically evaluate issues related to women and their representations in literature.	K4

K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis

### 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	3	2	3	3	3	2	3	2	3	1	2	32
CO2	3	3	3	2	3	3	3	3	3	1	3	1	1	33
CO3	3	2	2	2	2	2	3	2	3	2	3	1	2	28
CO4	3	2	3	3	3	3	3	2	3	3	3	1	3	35
CO5	3	2	3	3	1	3	3	1	3	2	3	1	3	32
Grand total of COs with PSOs and POs														45
Mean value of COs with PSOs and POs= 160/65														2.4

\*: S-Strong; M-Medium; L-Low

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.4
Observation	COs of Women's Writing– Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR– 625 514, MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE XV – NEW LITERATURES

(Outcome Based Syllabus under CBCS Structure for the Students admitted  
from the Academic Year 2022-2023 onwards)

Class : III B.A. English Literature Part : III Core-15  
Semester : VI Hours : 90  
Subject Code : 22UELD56 Credit : 5

**1. Course Educational Objectives:**

**Upon completion of the Course the students will be able to:**

- define the literatures of Post-Colonial Countries.
- recall the impact of colonization on a society.
- organize the knowledge of the cultural heritage of the Postcolonial literatures.
- analyse the rich cultural heritage of the World literatures.
- appraise the literary texts with Post-Colonial stance.

**UNIT– I POETRY (Detailed) (18 Hours)**

Langston Hughes : “The Negro Speaks of Rivers”  
P. K. Page : “First Neighbours”  
A.D. Hope : “Australia”  
Patrice Lumumba : “Dawn in the heart of Africa”  
Gabriel Okara : “Once Upon a Time”

**UNIT– II PROSE (Non-Detailed) (18 Hours)**

Ngugi wa Thiong o : “From Decolonising the Mind”  
Chinua Achebe : “The Novelist as Teacher”

**UNIT– III DRAMA (Detailed) (18 Hours)**

Wole Soyinka : *A Dance of the Forests*

**UNIT– IV SHORT STORIES (Non-Detailed) (18 Hours)**

Katherine Mansfield : “The Garden Party”  
Margaret Atwood : “The Moral Disorder”

**UNIT– V FICTION (Non-Detailed) (18 Hours)**

J. M. Coetzee : *Waiting for the Barbarians*

Coetzee J. M. *Waiting for Barbarians*. New Delhi: Rhuk, 2004, Print.

Narasimaiah, C. D. *An Anthology of Commonwealth Poetry*. New Delhi: Macmillan, 1990, Print.

Soyinka, Wole. *A Dance of the Forests*. Oxford University Press, 1963. Print.

Mansfield, Katherine. *The Garden Party and Other Stories*. New Delhi: Penguin, 1922. Print.

**3. Books for Reference:**

Greenblatt, Stephen. Ed. *The Norton Anthology of English Literature*. 9th ed., vol. F, W. W. Norton &

Company: New York, 2013. Print.

Dhawan, R. K. *Commonwealth Fiction*. Chennai: Classical Publication, 1988. Print.

Thieme, John. *The Arnold Anthology of Post-Colonial Literature*. Ed. London: Arnold, 1996. Print.

Wash, William. *Commonwealth Literature*. New Delhi: Macmillan Press, 1979. Print.

Walden, Dennis. *Post-Colonial Literature in English*. New Jersey: Blackwell Publication, 1983. Print.

Mansfield, K. *The Garden Party: and other stories*. New York, A. A. Knopf, 1923. Print.

#### 4. Teaching Learning Methods:

- Chalk and Talk
- ICT usage
- Practical Sessions
- Creative assignments
- Group discussion

#### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	recite the recently published literatures of Postcolonial Countries.	K2
CO2	represent the impact of colonization on a society.	K2
CO3	manipulate the knowledge of the cultural heritage of the Postcolonial literatures.	K3
CO4	categorize the rich cultural heritage of the World literatures.	K4
CO5	assess the literary texts with Post-Colonial stance.	K5

K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis

#### 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	2	2	3	3	2	2	2	2	2		1	26
CO2	3	2	3	2	3	3	2	2	2	3	2		2	29
CO3	3	2	3	2	3	3	2	2	2	3	2		1	26
CO4	3	2	2	3	3	3	3	2	2	2	2		2	29
CO5	3	2	3	2	3	3	3	1	2	2	3		2	29
Grand total of COs with PSOs and POs														139
Mean value of COs with PSOs and POs= 139/60														2.3

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.3
Observation	COs of New Literatures – Strongly related with PSOs and POs		

\*: S-Strong; M-Medium; L-Low

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE PAPER: XVI - MEDIA STUDIES

(Outcome Based Syllabus under CBCS Structure for the Students admitted  
from the Academic Year 2022-2023)

Class	: III B.A. English Literature	Part	: III Core-16
Semester	: VI	Hours	: 75
Subject Code	: 22UEL66	Credit	: 4

**1. Course Educational Objectives:**

**Upon the completion of the course the students will be able to:**

- acquire knowledge about mass media.
- acknowledge the history and freedom of press in India.
- understand the role of news and reporter in global arena.
- learn the art of writing and reporting.
- develop their creative ability.

**UNIT– I (15 Hours)**

Introduction to Media, Concepts of Global Media, Communication: Process, Types; Mass Communication and its Impact and Ethics of Media

**UNIT– II (15 Hours)**

History of Indian Press, Press Laws, Freedom of Press, Press Censorship, Media and Modern Society

**UNIT– III (15 Hours)**

News: Definition, News Types; News Agencies, Headlines, Lead, Breaking News, Freelance Journalism, Celebrity Journalism and Liable Investigation Journalism

**UNIT– IV (15 Hours)**

Editor, Sub-editor: Roles and Responsibilities; Editorials, Reporting: Definition, Types; Characteristics of a Good Reporter, Online Writing (Content, Column & Feature writings) Interviews and Advertisements

**UNIT– V (15 Hours)**

Practice on News Writing, Online Writing, Ad- making and Taking Professional Interviews

**2. Books for Study:**

Kumar, Keval, J. *Mass Communication in India*. Mumbai: Jaico Publishing House, 2010. Print.  
Mehta, D. S. *Mass Communication and Journalism in India*. New Delhi: Allied Publishers Private Ltd., 1979. Print.

Sarkar, R. C. S. *The Press in India*. New Delhi: S. Chand & Company Ltd., 1984. Print.

**3. Books for Reference:**

Parthasarathi, Rangaswamy. *Journalism in India*. New Delhi: Sterling Publishing, 2011. Print.  
Ahuja, B. N. *Theory and Practice of Journalism*. New Delhi: Surjeet Publications, 2005. Print.  
Mc Quail, Dennis. *Mass Communication Theory: An Introduction*. London: Sage Publication Ltd, 2010. Print.

#### 4. Teaching Learning Methods:

- Chalk and talk
- Power Point Presentations
- Seminar
- Quiz
- Roleplay
- Assignments
- Group discussion

#### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	recall and Explain the growth of mass media.	K2
CO2	summarize the history and laws of press in India.	K2
CO3	examine and Analyze the role of news and reporter in global arena.	K4
CO4	analyze the art of writing and reporting.	K4
CO5	develop the art of Ad- making and Feature writing.	K4

#### 6. Mapping Course Outcome with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	3	1	2	3	3	3	3	3	3	3	2	3	35
CO2	2	2	1	2	3	3	3	3	3	3	3	1	2	31
CO3	3	3	1	2	2	3	3	3	3	3	2	1	3	32
CO4	3	3	1	2	2	3	3	3	3	3	2	2	3	33
CO5	3	3	1	2	2	3	3	3	2	3	2	1	3	31
Grand total of COs with PSOs and Pos														162
Mean value of COs with PSOs and POs= 162/65														2.4

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.4
Observation	COs of Media Studies – Strongly related with PSOs and Pos		

\*: S-Strong-3; M-Medium-2; L-Low-1

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR– 625 514, MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE**

**SELF LEARNING COURSE VI – INDIAN DRAMA  
(Outcome Based Syllabus under CBCS Structure for the Students admitted  
from the Academic Year 2022-2023 onwards)**

Class : III B.A. English Literature  
Semester : VI  
Subject Code : 22UELSL6

Part : SLC  
Hours :  
Credit : 3

**1. Course Educational Objectives:**

**Upon completion of the Course the students will be able to:**

- introduce the learners the select plays in Indian Drama.
- train students' theatrical skills.
- make students comprehend the historical movements in dramatic literature and practice.
- familiarize student current trends in Indian Drama.
- enable students get employment or get graduate study in theatre.

**UNIT– I**

Rabindranath Tagore : *The Post Office*

**UNIT– II**

Girish Karnad : *Tughlaq*

**UNIT – III**

Gurcharan Das : *Larins Sahib*

**UNIT - IV**

Dina Mehta : *Brides are Not for Burning*

**UNIT– V**

Manjula Padmanabhan : *Harvest*

**2. Books for Study:**

Das, Gurcharan. *Larins Sahib*. Chennai: Penguin Books India PVT, Ltd, 2012. Print.  
Karnad, Girish. *Tughlaq: Three Plays*. New Delhi: OUP, 1994. Print.  
Mehta, Dina. *Brides are not Burning*. Chennai: Rupa & Co, 1993. Print.  
Tagore, Rabindranath. *The Post Office*. Laxmi Publication, 2000. Print.  
Padmanabhan, Manjula. *Harvest*. New Delhi: Pauls Press, 1977. Print.

**3. Books for Reference:**

Iyengar, Srinivasa K.R. *Indian Writing in English*. New Delhi: Sterling, Pvt. Ltd., 1984. Print.  
Naik, M. K. *A History of Indian English Literature*. New Delhi: Sahitya Akademi, 1999. Print.

**4. Teaching Learning Methods:**

- Chalk and talk
- Power Point Presentations
- Seminar
- Quiz

- Assignments
- Group discussion

**5. Course Outcome: Upon completion of the Course the student is able to:**

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	familiarize with the plays in Indian Drama.	K2
CO2	get trained in theatrical skills.	K2
CO3	comprehend the historical movements in dramatic literature and practice.	K3
CO4	familiarize current trends in Indian Drama.	K2
CO5	be well-versed in theatrical studies.	K3

**6. Mapping Course Outcome with PSO and PO:**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	3	2	3	3	2	3	3	2	2		2	30
CO2	3	2	3	3	3	3	3	3	3	2	2		2	32
CO3	3	3	3	2	3	3	2	3	3	2	2		2	31
CO4	3	1	3	2	3	3	2	3	3	2	2		2	29
CO5	3	2	3	2	3	3	2	3	3	2	2		2	28
Grand total of COs with PSOs and POs														150
Mean value of COs with PSOs and POs= 150/60														2.5

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.5
Observation	COs of British Drama– Strongly related with PSOs and POs		

\*: S-Strong; M-Medium; L-Low

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.**  
**DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE**  
**VALUE ADDED COURSE : ENGLISH THROUGH LSRW**

(for students admitted from the Academic Year 2023-2024 onwards under the CBCS pattern)

<b>Class</b>	: II UG	<b>Part</b>	: Value Added Course: 02
<b>Semester</b>	: IV	<b>Hours</b>	: 30
<b>Sub. Code</b>	: 23VELO1	<b>Credit</b>	:

**1. Course Educational Objectives:**

**Upon completion of the Course the students will be able to:**

- get confidence and communicate in simple English.
- understand the English pronunciation and its phonemes.
- read short articles, newspapers and literary pieces.
- write Formal letters, Note making and Note taking
- take seminars and short talks.

**Unit – I Listening (6 hours)**

Listening Short Videos and Audios

Listen to simple conversations in everyday contexts and respond

**Unit – II Speaking (6 hours)**

Pronunciation with phonic symbols

Giving and asking for directions

**Unit – III Reading (6 hours)**

Reading Short articles - newspapers/ reports / fact-based articles

Reading loud: Reading a prose passage, poem, short story

**Unit – IV Writing (6 hours)**

Formal (Writing official email, memos and notices) and Informal communication  
(Writing informal letters and applications)

Descriptive writing - Writing a short descriptive essay of two to three paragraphs

Note making and Note taking

**Unit – V Presentation Skills (6 hours)**

Taking seminar

Short talks

**2. Books for study:**

Carnegie, Dale. and J. Berg Esenwein. *The Art of Public Speaking*. Rupa Publications: New Delhi, 2018. Print.

Rani, Esther. *LSRW Skills for English Learners*. LAP LAMBERT Academic Publishing: Mauritius, 2020. Print.

Yates, Jean. *Practice English Conversation*. McGraw-Hill Education: New York, 2020. Print.

**3. Books for Reference:**

Khanna, Pooja. *English Communication*. S. Chand Publishing: New Delhi, 2016. Print.

Gorg, Manoj Kumar. *English Communication: Theory and Practice*. Scholar Tech Press: New Delhi, 2020. Print.

Shankar, R. *Communication Skills in English Language*. ABD Publishers: New Delhi, 2011. Print.

#### 4. Teaching Learning Methods:

- Chalk and talk
- Seminar
- Quiz
- Assignments
- Group discussion

#### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	get confidence and communicate in simple English.	K2
CO2	understand the English pronunciation and its phonemes.	K2
CO3	read short articles, newspapers and literary pieces.	K3
CO4	write Formal letters, Note making and Note taking.	K4
CO5	take seminars and short talks.	K4

KI, Knowledge K2- Understanding K3- Applications K4 – Analyze K5- Synthesis

#### 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	2	2	2	2	2	3	3	3	3	3	3	2	2	32
CO2	2	3	2	1	3	2	2	2	2	2	2	2	2	27
CO3	3	2	3	1	3	3	3	3	2	2	2	3	2	32
CO4	3	1	2	2	3	3	3	3	3	3	2	2	2	32
CO5	3	3	3	3	3	3	2	2	2	2	2	2	2	32
Grand total of COs with PSOs and Pos														155
Mean value of COs with PSOs and POs= 155/30														3.0

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	low	Medium	Strong
Mean value of COs with PSOs and Pos			3.0
Observation	COs of English through LASRW – Strongly related with PSOs and Pos		

\*: S-Strong; M-Medium; L-Low

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.

DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

VALUE ADDED COURSE – 4: FILM APPRECIATION

(for students admitted from the Academic Year 2023-2024 onwards under the CBCS pattern)

Class : I PG

Part : Value Added Course: 04

Semester : II

Hours : 30

Sub. Code : 23VELO2

Credit :

### 1. Course Educational Objectives:

Upon completion of the Course the students will be able to:

- introduce early film history.
- enable students to appreciate film in a more informed manner.
- identify genres and their structure.
- elaborate on various film movements in shaping the way films are now made.
- understand new methods of identifying film ideology through spectatorship.

#### UNIT – I

(06 Hours)

Introduction: Early film history, development of film as a form, narrative structure in film making from the point of view of specific film clips.

#### UNIT – II

(06 Hours)

The Language of Cinema

#### UNIT – III

(06 Hours)

Genre Films

#### UNIT – IV

(06 Hours)

Film Aesthetics

#### UNIT – V

(06 Hours)

Film Analysis

### 2. Recommended Films:

Rashomon (1950) Dir. Akira Kurosawa

Parasakthi (1952) Dir. R. Krishnan

Pather Panchali (1955) Dir. Satyajit Ray

Psycho (1960) Dir. Alfred Hitchcock

The Godfather (1972) Dir. Francis Ford Coppola

Mahanadhi (1994) Santhana Bharathi and co-written by Kamal Haasan

Anbe Sivam (2003) written by Kamal Haasan

Parasite (2019) Dir. Bong Joon-ho

Ayothi (2023) directed by R. Manthira Moorthy

### 3. Books for Reference:

Arnheim, Rudolf. *Film as Art*. University of California Press, 1957. Print.

Baskaran, S. Theodore *The Eve of the Serpent: An Introduction to Cinema* East West Book (Madras)

Pvt., Ltd., 1996. Print.

Bordwell, David and Kristin Thompson. *Film Art: An Introduction*. Eleventh edition, New York:

McGraw-Hill, 2016. Print.

Braudy, Leo & Cohen, Marshall (Eds). *Film Theory & Criticism: Introductory Readings*. Oxford U.P,

2016. Print.

Chatterjee, Shoma, A. *Hundred Years of Jump-cuts and Fade-outs: Tracking Change* Ravi Vasudevan.

New Delhi: Oxford UP, 2000. 267-96. Print.

Vasudevan, Ravi. *Making Meaning in Indian Cinema*. New Delhi: Oxford UP, 2000. Print.

Virdi, Jyotika. *The Cinematic Image Nation: Indian Popular Films as Social History*. New Brunswick,

NJ: Rutgers UP, 2003. Print.

#### 4. Teaching and learning methods:

- Chalk and talk
- Power Point Presentations
- Work Sheets
- Video Clippings
- Composition
- Quiz
- Exercise
- Assignments

#### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	introduce early film history.	K1
CO2	enable students to appreciate film in a more informed manner.	K1,K2
CO3	identify genres and their structure.	K3
CO4	elaborate on various film movements in shaping the way films are now made.	K4
CO5	understand new methods of identifying film ideology through spectatorship.	K3 & K4

**K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis**

### 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	3	2	3	3	2	3	3	2	2		2	30
CO2	3	2	3	3	3	3	3	3	3	2	2		2	32
CO3	3	3	3	2	3	3	2	3	3	2	2		2	31
CO4	3	1	3	2	3	3	2	3	3	2	2		2	29
CO5	3	2	3	2	3	3	2	3	3	2	2		2	28
Grand total of COs with PSOs and Pos														150
Mean value of COs with PSOs and POs= 150/60														2.5

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.5
Observation	COs of Film Appreciation – Strongly related with PSOs and POs		

\*: S-Strong; M-Medium; L-Low

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.**  
**DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE**  
**VALUE ADDED COURSE – ENGLISH GRAMMAR: BASICS**  
**(for students admitted from the Academic Year 2023-2024 onwards under the CBCS pattern)**

Class : I UG Part : Value Added Course: 01  
Semester : II Hours : 30 hrs  
Sub. Code : 23VELE1 Credit :

**1. Course Objectives:**

**Upon completion of the Course the students will be able to**

- To enable the learners to learn the basic English grammar and conceptual knowledge in the English language.
- To train learners to use the language with confidence and without committing errors.
- To enable the students to assimilate the correct patterns of the language.
- To write and speak clearly, accurately, coherently and in simple style.
- To understand the differences in vocabulary when speaking/writing formally or informally.

**Unit – I (06 Hours)**

Parts of speech: Nouns - Pronoun, verbs, adverb, adjective, Prepositions, Conjunctions, Articles

**Unit - II (06 Hours)**

Tenses - Present Tense, Past Tense, and Future Tense

**Unit – III (06 Hours)**

Concord or Agreement, Conditional Sentences

**Unit - IV (06 Hours)**

Active Voice and Passive Voice, Reported Speech

**Unit – V (06 Hours)**

Vocabulary – Singular, Plural, Synonym and Antonyms, Spelling

**2. Book for Study:**

Joseph. K V. *A Text Book of English Grammar and Usage*. 2nd edition. Tata Mc Graw Hill Education Private Limited. 2012. Print.

**3. Book for Reference:**

Thomson. A. J and A. V. Martinet. *A Practical English Grammar*. 4<sup>th</sup> edition. Oxford University Press. 1986. Print.

**4. Teaching and learning methods:**

- Chalk and talk
- Power Point Presentations
- Video clippings
- Brain storming
- Quiz
- Assignments

**5. Course Outcome: Upon completion of the Course the student is able to:**

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	To enable the learners to learn the basic English grammar and conceptual knowledge in the English language.	K1,K2
CO2	To train learners to use the language with confidence and without committing errors.	K2
CO3	To enable the students to assimilate the correct patterns of the language	K3
CO4	To write and speak clearly, accurately, coherently and in simple style.	K4
CO5	To understand the differences in vocabulary when	K4

**K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis**

**6. Mapping Course Outcome with PSO and PO.**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	3	2	2	2	3	2	2	2	3	3	2	3	32
CO2	3	3	3	2	2	3	2	2	2	2	2	2	2	30
CO3	3	2	2	3	1	3	2	2	3	2	2	3	3	31
CO4	2	3	2	2	2	3	2	2	2	3	2	2	2	29
CO5	2	3	2	3	2	2	2	2	2	2	2	2	2	27
Grand total of COs with PSOs and POs														149
Mean value of COs with PSOs and POs= / 149														

\*: S-Strong; M-Medium; L-Low

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.  
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE**

**VALUE ADDED COURSE : ADVANCED COMMUNICATION SKILLS**

**(for students admitted from the Academic Year 2023-2024 onwards under the CBCS pattern)**

Class	: III UG	Part	: Value Added Course: 03
Semester	: VI	Hours	: 30
Sub. Code	: 23VELE2	Credit	:

**1. Course Educational Objectives:**

**Upon completion of the course the students will be able to**

- understand the word order.
- learn and perform day-to-day tasks.
- develop conversational skills
- defend the ideologies of Lesbians, Gays, Bisexuals and Transgender.
- examine the subtle nuances of gender issues for their research.

**UNIT – I (06 Hours)**

Word Order: Position of Adverbs-Position of Participles-Position of Infinitives  
(Pages 64-66 from Krishna Mohan and Meenakshi Raman)

**UNIT – II (06 Hours)**

Dicto-Composition: (Pages 112-116 from Krishna Mohan and Meenakshi Raman)

**UNIT – III (06 Hours)**

Conversational ability: Types, Purposes, Strategies for Effective Conversations,  
Telephonic Conversations (Pages 73-84 from Krishna Mohan and Meenakshi Raman)

**UNIT – IV (06 Hours)**

Paragraph Writing: Unity, Coherence, Adequate Development  
(Pages 132-143 from Krishna Mohan and Meenakshi Raman)

**UNIT – V (06 Hours)**

Communication through Technology: Word Processor, Desk Top Publisher (DTP),  
Power Point Presentation Electronic Mail  
(Pages 14-26 from Krishna Mohan and Meera Banerji)

**2. Books for Study:**

Banerji, Meera and Meenakshi Raman. *Advanced Communicative English: A Comprehensive Course for Undergraduate Learners*. Tata McGraw Hills, 2010. Print.

Banerji, Meera and Krishna Mohan. *Developing Communication Skills*. Trinity Press, end Edition, 2021. Print.

**3. Books for Reference:**

Khanna, Pooja. *English Communication*. S. Chand Publishing: New Delhi, 2016. Print.

Shankar, R. *Communication Skills in English Language*. ABD Publishers: New Delhi, 2011. Print.

#### 4. Teaching and learning methods:

- Chalk and talk
- Power Point Presentations
- Work Sheets
- Video Clippings
- Composition
- Quiz
- Exercise
- Assignments

#### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	understand order of the words in sentence.	K1
CO2	write sentences coherently.	K1,K2
CO3	converse in English.	K3
CO4	learn the nuances of academic writing.	K4
CO5	use digital tools to communicate.	K3 & K4

K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis

#### 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	3	2	3	3	2	3	3	2	2		2	30
CO2	3	2	3	3	3	3	3	3	3	2	2		2	32
CO3	3	3	3	2	3	3	2	3	3	2	2		2	31
CO4	3	1	3	2	3	3	2	3	3	2	2		2	29
CO5	3	2	3	2	3	3	2	3	3	2	2		2	28
Grand total of COs with PSOs and Pos														150
Mean value of COs with PSOs and POs= 150/60														2.5

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs	2.5		
Observation	COs of Advanced Communication Skills – Strongly related with PSOs and POs		

\*: S-Strong; M-Medium; L-Low

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.

DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

VALUE ADDED COURSE : PRESENTATION SKILLS

(for students admitted from the Academic Year 2023-2024 onwards under the CBCS pattern)

Class	: II PG	Part	: Value Added Course: 05
Semester	: IV	Hours	: 30
Sub. Code	: 23VELE3	Credit	:

### 1. Course Objectives:

Upon completion of the Course the students will be able to

- Communicate with clarity and improve presentation skills
- Learn the hints and tips for an effective presentation
- Deliver a variety of structured presentations extemporaneously, using verbal and non-verbal skills that illustrate audience
- Develop materials in preparation for the presentations.
- Present with style, flair and presence and to evaluate and critique presentations

#### UNIT – I (06 Hours)

Presentation Skills Basics: Presentation and Public Speaking, Basic elements of presentation and public speaking

#### UNIT – II (06 Hours)

The Four Modes of Speech Delivery: 1. Extemporaneous 2. Impromptu 3. Memorization 4. Reading.

#### UNIT - III (06 Hours)

Bodily Aspects of Speech Delivery, Body Language-gesture and posture, movement and anatomy of good posture, Common mistakes in Presentation and Public speaking, Tips for Smart speech.

#### UNIT - IV (06 Hours)

Staging the Presentation: Space, the presentation area, Lecterns, Lighting, Acoustics and Optional extras; The Role of the Master of Ceremonies - Equipment and Visuals: Preparing and using visual aids, i.e. Clicker/Wireless Pocket Presenter/Presentation Remote, USB flash drive, Presentation Checklist

#### UNIT - V (06 Hours)

Introduction to Microsoft Power Points: Tips for preparing attractive and powerful power point presentation - Rhetoric and Ethics of Persuasion - Types - Designs Analysis.

### 2. Book for Study:

Lucas, Stephen. *The Art of Public Speaking*. McGraw-Hill, 2014. Print.

### 3. Books for Reference:

McCarthy Patsy. & Caroline Hatcher. *Presentation Skills: The Essential Guide for Students*. Sage Publications, latest edition. 1999. Print.

Zelazny, Gene. *Say it with Presentations*. McGraw-Hill, latest edition. 2010. Print.

### 4. Teaching and learning methods:

- Chalk and talk
- Power Point Presentations
- Work Sheets
- Video Clippings
- Composition
- Quiz
- Exercise
- Assignments

### 5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	apply the aspects of presentation skills	K1
CO2	present the speech coherently	K1,K2
CO3	make speeches verbal and non-verbal presentation	K3
CO4	demonstrate lectures using the aids	K4
CO5	deliver speeches using power point presentation	K3 & K4

K1- Knowledge, K2- Understanding, K3- Application, K4- Analysis, K5- Synthesis

### 6. Mapping Course Outcome with PSO and PO

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	SUM OF PSOs with POs
CO1	3	2	3	2	3	3	2	3	3	2	2	3	2	33
CO2	3	2	3	3	3	3	3	3	3	2	2	3	2	35
CO3	3	3	3	2	3	3	2	3	3	2	2	2	2	33
CO4	3	1	3	2	3	3	2	3	3	2	2	2	2	31
CO5	3	2	3	2	3	3	2	3	3	2	2	3	2	30
Grand total of COs with PSOs and Pos														162
Mean value of COs with PSOs and POs= 150/60														2.5

\*: S-Strong; M-Medium; L-Low

Mapping scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.5
Observation	COs of Presentation Skills – Strongly related with PSOs and POs		

**DEPARTMENT OF COMMERCE WITH  
COMPUTER APPLICATIONS**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**PG DEPARTMENT OF COMMERCE**  
**B.COM WITH CA**  
**CBCS STRUCTURE**

<b>I SEMESTER</b>				
<b>PART</b>	<b>SUBJECT CODE</b>	<b>PAPER</b>	<b>Hrs</b>	<b>Cr</b>
I	22UTML11/ 22UHNL11/ 22UFNL11	Tamil/Hindi/French	06	04
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream – B	05	04
III		Core		
	22UCMC11	Financial Accounting -I	06	05
	22UCMC21	Computer Application in Business - Theory	03	03
	22UCMP11	Practical	03	02
IV	22UCMA11	Allied –I Business Economics	05	04
	22UFCE11	FC-Personality Development	01	01
	22UCSH12	Communication Skill	01	
V	22UBRC11	Bridge Course	-	01
	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC/NSS/Phy. Edn./YRC ROTARACT/AICUF/NCB	---	---
		Total	30	24
<b>II SEMESTER</b>				
I	22UTML22/ 22UHNL22/ 22UFNL22	Tamil/Hindi/French	06	04
II	22UENA22/ 22UENB22	English through Prose & Poetry – Stream – A English through Prose & Poetry – Stream - B	05	04
III		Core		
	22UCMC32	Financial Accounting –II	06	04
	22UCMC42	Business Application Programming – Theory	03	03
	22UCMP22	Practical	03	02
IV	22UCMA22	Allied – II Principles of Marketing	05	04
	22UFCH22	FC-Social Responsibility and Global Citizenship	01	01
V	22UCSH12	Communication Skill	01	01
	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC/NSS/Phy. Edn./YRC ROTARACT/AICUF/NCB	--	01
		Total	30	24
<b>III SEMESTER</b>				
III		Core		
	22UCMC53	Partnership Accounts	06	05
	22UCMC63	Information Technology - Theory	03	02
	22UCMP33	Practical	03	02
	22UCMC73	Practical banking	06	04

	22UCMA33	Allied – III Business Mathematics	05	04
IV	22UCMN13	Basic Tamil/Advanced Tamil Non Major Elective to Science Students - Principles of Accountancy	03	02
	22UCMS13	SBE – I –Business Communication	03	02
	22UFCE33	FC-Environmental Studies	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NCC/NSS/Phy. Edn./YRC ROTARACT/AICUF/NCB	---	---
	22UARE14	ARISE	----	---
		Total	30	22
<b>IV SEMESTER</b>				
III		Core		
	22UCMC84	Corporate Accounting I	06	05
	22UCMC94	E-Commerce - Theory Practical	03	02
	22UCMP44		03	02
	22UCMD04	Business Management	06	04
22UCMA44	Allied IV - Business Statistics	05	04	
IV	22UCMN24	Non Major Elective to Arts Students – 1. Aptitude Techniques for Competitive Exams	03	02
	22UCMS24	SBE II - Entrepreneurship Development	03	02
	22UFCH44	FC-Religious Literacy and Peace Ethics	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NCC/NSS/Phy. Edn./YRC ROTARACT/AICUF/NCB	---	01
	22UARE14	ARISE	---	01
		Total	30	24
<b>V SEMESTER</b>				
III		Core		
	22UCMD15	Cost Accounting	05	04
	22UCMD25	Programing With JAVA - Theory Practical	03	03
	22UCMP55		03	02
	22UCMD35	Auditing	05	04
	22UCMD45	International Business	04	04
	22UCMD55	Corporate Accounting II	05	04
22UCME15	Core Elective I – Investment Management Indian Financial Services Portfolio Management	03	03	
IV	22UJNT15	Internship (Holidays)	-	01
	22USSI16	Soft Skills	02	--
		Total	30	25
<b>VI SEMESTER</b>				
III		Core		
	22UCMD66	Accounting Package - Theory	02	02

	22UCMP66	Practical	04	02
	22UCMD76	Income Tax Law and Practice	05	04
	22UCMD86	Management Accounting	05	05
	22UCMD96	Commercial Law	05	04
	22UCMT06	Institutional Training	04	03
	22UCME26	Core Elective- II - Human Resource Management Advertising and Salesmanship Services Marketing	03	03
IV	22USSI16	Soft Skills	02	02
		Total	30	25

Semester	I	II	III	IV	V	VI	Total
Credits	24	24	22	24	25	25	144

**Self Learning Courses - Additional Credits**

Semester	Credits
III	3
IV	3
V	3
VI	3

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF B.Com. with C.A.**

**Class : III B.Com CA**  
**Semester : V**  
**Subject Code : 22UCMD15**

**Part : Core 11**  
**Hours : 75**  
**Credits: 04**

**1. Title of the Paper: Cost Accounting**

**2. Course Objectives (CO)**

1. To familiarize the various elements of cost and construct a cost sheet
2. To outline the procedure for purchase of material, maintaining level of stock and material cost control.
3. To Compute earnings of workers under different methods.
4. To calculate apportionment and allocation of overheads.
5. To Analyse costing techniques for contract work and process costing.

**3. Five units of Syllabus**

UNITS	CONTENT	HOURS
<b>I</b>	Costing: Definition – Importance of Costing – Objectives and advantages – Differences between cost accounting and financial accounting – Analysis and classification of costs – Preparation of cost sheet.	<b>15</b>
<b>II</b>	Materials: Purchase procedure – Requisition of material - Control – Recording and controlling of material department – Maintenance of stores – Minimum Level, Maximum Level, Re-order Level, Economic Order Quantity – Methods of pricing the issue of materials – FIFO and LIFO, Simple average and weighted average method .	<b>15</b>
<b>III</b>	Labour: Methods of remunerating labour – Incentive schemes – Halsey Premium Plan, Rowan system, Emersion efficiency Bonus and Beaux Point Premium – Idle time – Control over Idle time —measurement of Labour Turn over.	<b>15</b>
<b>IV</b>	Accounting of Overheads: Classification – Fixed and Variable Overheads – Basis of charging overheads – Allocation – Works overhead, Administration overheads, Selling and distribution overheads – Appropriation and absorption - Activity Based Costing - Concept - Need for ABC.	<b>15</b>
<b>V</b>	Contract Costing: Profit on incomplete contracts – Simple problems only (excluding estimated contracts) Process costing: Normal loss, abnormal loss and Abnormal gain. (Simple problems only.)	<b>15</b>

#### 4. Text Book:

T.S. Reddy and Dr.A. Murthy 2018,"Cost Accountig" Margham Publications, Chnenai.

#### 5. Reference Books:

1. Shukla.M.C ,& T.S. Grewal, 2000, "Cost Accounting", S.Chand& Company Ltd. New Delhi.
2. Alex, K. 2007,' Cost Accounting', ARR Publications, Trichy – 2.

#### 6. Teaching Learning Method:

PPT, Seminar, Quiz programme, Assignment, Chalk and talk,

#### 7. Course Outcome (CO):

After completion of the course the students will be able to

Sl. No.	Course Outcome	Knowledge Level
CO1	Describe how cost accounting is used for decision making and performance evaluation and to construct cost sheet	K2
CO2	Develop the procedure involved in purchase of material, maintaining level of stock and material cost control	K2
CO3	Apply the concept and techniques for calculating earnings of workers under different methods	K3
CO4	Demonstrate working knowledge in allocation and apportionment of overheads	K3
CO5	Analyse the problems of process and contract costing	K4

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyze, K5-Evaluate K6-Create**

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	1		3	3	3		1	1	1		22
CO2	3	3	3	2	3	3	3	2	3	2	2	1	2	32
CO3	3	3	2	3	2	3	3	2	3	3	2	1	1	31
CO4	3	3	2	3	2	3	3	3	2	3	3	2	1	33
CO5	3	3	1	1		3	3	1	1		3	3	2	24
<b>Grand Total of COs with PSOs and POs</b>														<b>142</b>
<b>Mean Value of COs with PSOs and POs(/60)</b>														<b>2.36</b>

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATIONS**

Class	: III B.Com CA	Part	: Core 12
Semester	: V	Hours	: 45
Subject Code	: 22UCMD25	Credits	: 03

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**1. Title of the Paper: Programming with JAVA**

**2. Course Objectives (CO):**

1. To understand the feature and structure of java programming.
2. To learn the fundamentals of constants, variables and operators.
3. To enable them to create program using decision making concept.
4. To import knowledge on classes, objects and methods.
5. To learn how to use exception handling and string handling in java application.

**3. Five units of the Syllabus:**

UNITS	CONTENT	HOURS
<b>I</b>	Fundamentals of OOP: Basic concept of OOPs– benefits of OOPs - Java features - Java and internet- Java and world wide web- <b>Overview of java language:</b> Java program structure- java tokens-java statements-implementing a java program.	<b>9</b>
<b>II</b>	<b>Constants:</b> constants-Data types-Declaration of variables-giving values to variables- <b>Operators:</b> Arithmetic Operators – Relational Operators – The Assignment Operators – The ?operator – Operator precedence	<b>9</b>
<b>III</b>	<b>Decision making and branching:</b> decision making with if statements- simple if- if else- nested if- else if ladder- the switch statement- while statement- do statement- for statement. <b>Classes:</b> Defining a class-methods overloading.	<b>9</b>
<b>IV</b>	<b>Classes, Objects and Methods:</b> Introduction-Defining a Class- Fields Declarations-Methods Declaration- Creating Objects- Accessing Class Members-Constructors-Methods Overloading- Static Members-Nesting of method	<b>9</b>
<b>V</b>	<b>Exception Handling:</b> Exception Handling Fundamentals – Using try and catch – throw – throws – finally. <b>String Handling:</b> String Comparison – Searching Strings – Modifying a String – Changing the Case of Characters within a String.	<b>9</b>

**4. Text Book:**

E. Balagurusamy, Programming with Java, 5<sup>th</sup> Edition, TMH Publications.

**5. Reference Books:**

Herbert Schildt, “The Complete Reference – JAVA 2”, Tata McGraw-Hill, Fifth Edition 2002.

Peter Norton, “Peter Norton Guide to Java Programming”, Techmedia Publication, 2<sup>nd</sup> Edition.

**6. Teaching Learning Methods:**

Power Point Presentation, Group Discussion, Quiz, Assignments, etc....

### 7. Course Outcome (CO):

After Completion of the Course Programming with Java the students will be to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Designing the structure of Java and to know how to implement the Java programming code	K2
CO 2	Applying the concepts of constants, variables and operators in java to perform Java programming	K3
CO 3	Develop programs using if statements and loops	K4
CO 4	Able to create programs with multiple methods	K3
CO 5	Applying the exception handling and string handling functions in java program.	K5

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	1	2	1	1	3	3	3	3	1	2	3	1	3	27
CO2	1	3	2		2	3	3	3	1	2	3	1	3	27
CO3	3	3	2		2	3	3	3	2	2	3	1	3	30
CO4	3	3	3			3	3	3	3	2	3	2	3	31
CO5	3	1	3	3	3	3	3	1	1	3	3		1	28
<b>Grand Total of COs with PSOs and POs</b>														<b>143</b>
<b>Mean Value of COs with PSOs and POs(143/60)</b>														<b>2.33</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.33
Observation	COs of Programming with Java strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

<b>Class</b>	<b>: III B.Com CA</b>	<b>Part</b>	<b>: Core Lab-5</b>
<b>Semester</b>	<b>: V</b>	<b>Hours</b>	<b>: 45</b>
<b>Subject Code</b>	<b>: 22UCMP55</b>	<b>Credits</b>	<b>: 2</b>

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**LAB CYCLE FOR JAVA**

1. Program to calculate simple interest
2. Program to find area and perimeter of circle, square, rectangle
3. Program for arithmetic operation
4. Program to find the biggest three number
5. Program for mathematical function
6. Program to find the sum of n numbers
7. Program to display student mark sheet
8. Program to get and display the employee details
9. Program using try and IOException
10. Program to compare strings
11. Program to find the length of the string
12. Program using method overloading
13. Program to reverse the string.
14. Program to trim the string
15. Program to find the number is odd or even.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATIONS**

Class	: III B.Com CA	Part	: Core 13
Semester	: V	Hours	: 75
Subject Code	: 22UCMD35	Credits	: 04

**1. Title of the Paper:** Auditing

**2. Course Objectives (CO):**

To make the students

1. To gain knowledge about the fundamentals of Auditing
2. To understand the audit of companies internal check and the procedure for internal check
3. To develop Critical thinking through Vouching.
4. To analyse the Verification and valuation of assets and liabilities.
5. To familiarize the auditing of banking companies.

**3. Five units of the Syllabus:**

UNITS	CONTENT	HOURS
<b>I</b>	Auditing - Definition-Objectives-, Auditing & Investigation-Advantages of Audit-Qualities of an auditor-Liabilities of an Auditor -Various types of Audit-Conduct of Audit: Procedure of Audit, Audit Programme-Audit notes, Audit files-Working papers – E-Auditing.	<b>15</b>
<b>II</b>	Internal Control: Internal Check –Meaning –Definitions-objectives –procedure of internal check – Advantages – Duties of an auditor in connection with internal check	<b>15</b>
<b>III</b>	Vouching: Meaning- Definitions- Importance – Duties of an auditor –Vouching receipts - cash sales- Receipts from debtors-Other receipts- Vouching payments- –Wages-Capital expenditure- Other payments and expenditure of petty cash payments- Vouching of banks- transactions-Vouching of cash - Returnable containers – Sales Return - Sales Ledger.	<b>15</b>
<b>IV</b>	Valuation and Verification of Assets & Liabilities - Fixed assets- Wasting Assets- Investments-Inventories, Freehold and Lease hold property- Loans and advances-Bills receivables – Sundry Debtors- Plant and machinery – patents and copy rights.	<b>15</b>
<b>V</b>	The Auditing of Banking Companies – Auditing of Nationalized banks – Special points to be noted in the case of bank Audit – The Audit of Co – operative banks and institutions – Insurance companies – Government accounts and their Audit.	<b>15</b>

**4. Books for Study:**

1. Tandon, B.N, 2007, “Auditing”, S. Chand & Son Company, New Delhi.

**5. Books for Reference :**

1. Kamal Gupta, 2006, “Fundamentals of Auditing”, Tata McGraw Hill, New Delhi.
2. Premavathy, 2006, ‘Practical Auditing’, Sri Vishnu Publications., Chennai.



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**

**DEPARTMENT OF COMMERCE**

Class : III BCOM CA

Part : Core 14

Semester : V

Hours : 60

Subject Code : 22UCMD45

Credit : 4

**1. Title of the paper: International Business**

**2. Course Objectives (CO):**

- 1) To impart the knowledge and skills of analysis on operational processes of business between two or more nations.
- 2) To understand the application of International Business Environment.
- 3) To create awareness on international organizations and arrangements.
- 4) To evaluate the concept of international finance and foreign exchange.
- 5) To learn foreign trade procedures and international logistics management.

**3. Five Units of Syllabus:**

<b>S.NO</b>	<b>CONTENT</b>	<b>NO OF HOURS</b>
<b>UNIT-1</b>	<b>International Business and Theories of International Trade:</b> Importance, Nature and Scope of International Business, Stages of International Business, Evolution of International Business, Modes of Entry. International Business Approaches: Classical, Neo-Classical Approach, Modern Approach. Introduction to theory of Absolute Differences in Costs by Adam Smith, Ricardian Theory of Comparative Costs.	<b>12</b>
<b>UNIT-2</b>	<b>International Business Environment :</b> Introduction - Social and cultural Environment - Technological Environment - Economic Environment - Political Environment	<b>12</b>
<b>UNIT-3</b>	<b>International Organizations and Arrangements:</b> WTO – Its objectives, principles, organizational structure and functioning; An overview of other organizations – UNCTAD, Commodity and other trading agreements (OPEC).Regional Economic Co-operation: Forms of regional groupings; Integration efforts among countries in Europe, North America and Asia (NAFTA, EU, ASEAN and SAARC). International Financial Environment: International financial system and institutions (IMF and World Bank – Objectives and Functions) ;.	<b>12</b>
<b>UNIT-4</b>	<b>International Finance and Foreign Exchange:</b> International Finance environment - Global capital structure - The Foreign Exchange market- Convertibility of the rupee and its implications - Foreign Institutional Investors - Global Depository Receipts - Capital expenditure analysis.	<b>12</b>

<b>UNIT-5</b>	<b>Foregin Trade Procedures</b> : Export Procedures - Import procedures - Export promotion <b>International Production and Logistics Management:</b> Generic strategies of the International Business - Auquisition of resources - Location Decisions - International logistics management.	<b>12</b>
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**4. Text Book:**

1. Subba Rao, International Business, Himalaya Publishing House 2015, Mumbai.

**5. Reference Books:**

1. S.Sankaran, International Business, Himalaya Publishing House, 2010, Mumbai.
2. Khushpat S.Jain, Export Import Procedures & Documentation, Himalaya Publishing House 2011, Mumbai.
3. Aswathappa, International Business, Tata McGraw Hill Education Private Limited, New Delhi.
4. Useful Websites: The Economist, WTO, IMF, World Bank, China's Ministry of Commerce

**6. Teaching Learning Methods:**

Power point presentation, Seminars, Quiz Programme, Assignment, Test, Chalk and Talk method, Student staging presentation.

**7. Course Outcomes (CO):**

After Completion of the Course International Business the students will be able to

<b>CO No.</b>	<b>Statement</b>	<b>KNOWLEDGE LEVEL (Bloom's Taxonomy)</b>
CO 1	Grasp the concept in international business with respect to foreign trade/ international business	<b>K2</b>
CO 2	Apply the currents business phenomenon and to evaluate the global business environment in terms of economic, social legal and technological aspects	<b>K3</b>
CO 3	Evaluate the impact of strategies and regulatory compliance on an organizations integrative trade business.	<b>K4</b>
CO 4	Identify and interpret relevant international financial strategies that support an organizations integrative trade initiatives	<b>K4</b>
CO 5	Manage the preparation of documents and the application of procedures to support the movement of products and services in the organizations global supply chain	<b>K5</b>

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

**Mapping of COs with PSOs and POs**

<b>Objectives</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>	<b>Sum of COs with PSOs and POs</b>
<b>Outcomes</b>														
CO1	3	3	2	3	3	3	3	3	3	1	1		3	31
CO2	3	3	2	3	2	3	3	3	3	2	3	2	2	34
CO3	3	3	3	2	1	3	3	2	2	2	1	2	1	28
CO4	3	3	3	3	2	3	3	3	2	3	2	3	1	34
CO5	3	3	3	2		3	3		2	1		1		19
<b>Grand Total of COs with PSOs and POs</b>														<b>146</b>
<b>Mean Value of COs with PSOs and POs(146/60)</b>														<b>2.43</b>

**Strong -3, Medium -2, Low-1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean value of COs with PSOs and POs</b>			<b>2.43</b>
<b>Observation</b>	<b>COs of International Business strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR –625514**  
**DEPARTMENT OF COMMERCE**

**Class : III B. Com CA**

**Part : Core 15**

**Semester : V**

**Hours : 75**

**Subject Code : 22UCMD55**

**Credits: 04**

**1. Title of the paper: CORPORATE ACCOUNTING - II**

**2. Course Objectives:**

- To train the students in concepts of Amalgamation and External Reconstruction of companies.
- To enlighten the students on Holding companies and external reconstruction of the companies.
- To impart the knowledge on Banking and Insurance companies.
- To understand the recording of Final Accounts in the companies.
- To demonstrate the concepts to acquire the Profit or Loss statements and other Accounts for the respective company accounts with adjustments.

**3. Five Units of syllabus:**

UNIT	CONTENT	HOURS
I	<b>Holding Companies</b> Meaning and Definition of Holding Company and Subsidiary Company – Preparation of Consolidated Balance Sheet – Consolidated Profit and Loss Accounts.	15
II	<b>Amalgamation &amp; Absorption</b> Meaning – External Reconstruction – Types of Amalgamation – Computation of Purchase Consideration – Methods of Accounting for Amalgamation – Pooling of Interests Method – Purchase Method.	15
III	<b>Bank Accounts</b> Business of Banking Companies – Preparation of Profit and Loss Account – Balance Sheet (Guidelines of RBI) -Items Requiring Special Attention in Preparation of Final Accounts.	15
IV	<b>Insurance Company Accounts</b> Insurance Accounts- Types –Revenue Account Preparation of Final Accounts of Insurance Companies - Final accounts of Life Insurance- Profit determination of Life Insurance	15
V	<b>Inflation Accounting</b> Inflation Accounting – Different methods of Inflation Accounting – Current Purchase Power Method – Current Cost Accounting Method – Hybrid Method.	15

**4. Book for Study**

1. Reddy.T.S&Murthy.A. (2014),”Corporate Accounting”, Margham Publications, Chennai.

### 5. Books for Reference:

1. Hanif and Mukherjee. (2004), "Modern Accountancy", Tata McGraw Hill Publishing Company Ltd, New Delhi.
2. Shukla M.C., Grewal T.S (2004), "Advanced Accountancy", Sultan Chand & Company Ltd, New Delhi.

### 6. Teaching Learning methods:

PPT, Lecture, Test, Assignment

### 7. Course Outcome (CO):

CO No.	Statement	Level
CO 1	Familiarise the students with the Basic knowledge in Amalgamation & Absorption.	K1 & K2
CO 2	Classify and understand the Holding Companies.	K2
CO 3	Interpret the problems of final accounts of Banking companies.	K3
CO 4	Understand the accounting of Insurance Companies.	K3
CO 5	Interpret the problems of amalgamation, absorption.	K2

### 8. Mapping Course outcome with

- (i) Programme Specific Objectives - **PSO**(put tick mark in the correlating box)
- (ii) Programme Objectives - **PO**(put tick mark in the correlating box)

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	3	3	-	3	3	2	3	2	-	1	1	27
CO2	3	3	3	3	2	3	2	2	1		2	-	-	24
CO3	3	3	3	-	3	3	3	-	2	2	-	2	-	24
CO4	3	2	3	3	-	3	2	2	-	2	2	-	2	24
CO5	3	3	3	2	3	3	2	2	3	2	-	-	2	28
Grand Total of COs with PSOs and POs														127
Mean Value of COs with PSOs and POs(127/52)														2.45

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.45
Observation	COs of Corporate Accounting - II strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATIONS**

Class : III B. Com CA  
 Semester : V  
 Subject Code : 22UCME15 (A)

Part : Core Elective  
 Hours : 45  
 Credit : 3

**INVESTMENT MANAGEMENT**

**1. Title of the Paper : Investment Management**

**Course Objectives (CO):**

To facilitate the learners:

1. Understand the meaning of the term investment and the unique features of investment programme.
2. Gain a comprehensive knowledge on financial institutions and markets in India and the structure of financial system
3. Develop a perfect understanding on the securities exchange board of India.
4. Identify the risks involved in different alternatives and enable them to analyse the return they get out of their portfolio.
5. Get a wide knowledge on the importance of ideal portfolio

**3. Five units of Syllabus**

Unit	Content	Hours
1.	<b>Investment Management:</b> Meaning-Nature and scope of investments management – investments and speculation – Investment and Gambling – investment avenues– features of an investment programme – investment process and stages in investment.	9
2.	<b>Financial Institutions and Markets in India:</b> Development of the financial system in India – structure of financial markets , financial institutions — New developments in the financial system.	9
3.	<b>The Securities Exchange Board of India:</b> Kinds of Market-New issue market and stock exchange in India - Role of the new issue market – mechanics of floating new issues – Development in the stock market. Meaning – definition-Nature and scope. Objectives - functions organization of SEBI – SEBI’s Role in the primary market and secondary market	9
4.	<b>Return and Risk:</b> Return; Definition – measurement – traditional technique – statistical methods. Risk ; Definition – systematic risk – Unsystematic risk – quantitative analysis of risk.	9
5.	<b>Portfolio Investment:</b> Meaning- importance of ideal portfolio-Government securities – Life insurance – Private insurance companies –Commercial bank – post office scheme – Fixed deposit schemes in companies – New instruments – Mutual fund – Investment in real estate and Gold.	9

#### 4. Text book:

Preethi Singh, 2009, Investment Management, Himalaya Publishing House, Mumbai.

#### 5. Reference:

Punithavathy Pandian, 2004, Security Analysis and Portfolio Management, Vikas Publishing House Private Ltd.

#### 6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion.

#### 7. Course Outcome (CO):

After Completion of the Course Investment Management the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the meaning of the term investment and the unique features of investment programme	K2
CO 2	Gain a comprehensive knowledge on financial institutions and markets in India and the structure of financial system	K1
CO 3	Develop a perfect understanding on the securities exchange board of India	K3
CO 4	Identify the risks involved in different alternatives and enable them to analyse the return they get out of their portfolio	K4
CO 5	Get a wide knowledge on the importance of ideal portfolio	K1

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	3	2	2	3	3	2	3	2	1			27
CO2	3	3	3	3	2	3	2	2	2		-	2	2	27
CO3	3	3	2	2	3	3	3	3			2	2	1	27
CO4	3	3	3	3	3	3	2	1	2	1	2	-	-	26
CO5	3	3	1	3	2	3	3	2	1	2	1		1	25
<b>Grand Total of COs with PSOs and POs</b>														<b>132</b>
<b>Mean Value of COs with PSOs and POs(132/56)</b>														<b>2.35</b>

Strong -3, Medium -2, Low-1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean value of COs with PSOs and POs</b>			<b>2.35</b>
<b>Observation</b>	<b>COs of Investment Management strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATIONS**

Class : III B. Com CA

Part : Core Elective

Semester : V

Hours : 45

Subject Code : 22UCME15 (B)

Credit : 3

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**1. Title of the Paper: INDIAN FINANCIAL SERVICES**

**2. Course Objectives (CO):**

To facilitate the learners:

1. Understand the concept of Financial Assets, Financial intermediaries, Financial markets and Financial system and the share of financial system on the economic development.
2. Know about the features of Money Market and the recent developments in Indian Money Market.
3. Gain a comprehensive knowledge on the functions of New Issue Market and the Recent trends in the New issue market.
4. To build a strong understanding on the functions of securities exchange board of India, guidelines and the functions of credit rating.
5. To increase the awareness in the areas of stock exchange, brokers and their assistants –On line trading, speculative transactions and Stock indices.

**3. Five units of Syllabus:**

Unit	Content	Hours
1.	<b>Structure of the Financial System</b> – Functions of the financial system – Financial concepts, Financial Assets, Financial intermediaries – Financial markets – Money market – Capital Market – Foreign exchange Market – Financial Instruments : – Financial system and economic development – Financial system in India	9
2.	<b>Money Market</b> – Definition – Features of Money Market – Importance of Money Market – Composition of Money Market – Call Money Market – Commercial Bills, Treasury Bills Market- Commercial Paper – Money Market Instruments – Recent developments in Indian Money Market.	9
3.	<b>New Issue Market</b> – Functions of New Issue Market – Distinction between New Issue Market and Stock Exchange – Methods of floating new issue – Principal steps of a Public issue – Recent trends in the New issue market.	9
4.	<b>Securities and Exchange Board of India</b> –SEBI’s Guidelines - Depository – Distribution NSE,BSE,SENSEX – Mutual Funds& Merchant Banking – Credit Rating.	9
5.	<b>Secondary Market</b> – Functions of stock exchange – Organization of stock exchanges in India –Registration of stock brokers - Kinds of brokers and their assistants –On line trading, speculative transaction – Stock indices.	9

#### 4. Text Book:

E.Gordon and K.Natarajan "Financial Markets and Services" Eight Edition, Himalaya Publishing House, Mumbai, 2013.

#### 5. Reference Books:

- 1.P.N.Varshney&D.K.Mittal "Indian Financial System" Eleventh Edition, Sultan Chand & Sons, New Delhi, 2010.
- 2.E.Gordon&K.Natarajan "Financial Markets & Institution" Second Edition, Himalaya Publishing House, Mumbai, 2010.
- 3.H.R.Machiraju "Indian Financial System" Fourth Edition, Vikas Publishing House, Noida, 2010.

#### 6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion

#### 7. Course Outcome (CO):

After Completion of the Course Indian Financial System the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the concept of Financial Assets, Financial intermediaries, Financial markets and Financial system and the contribution of financial system towards the economic development	K2
CO 2	Know about the features of Money Market and the recent developments in Indian Money Market	K1
CO 3	Gain a comprehensive knowledge on the functions of New Issue Market and the Recent trends in the New issue market	K3
CO 4	To build a strong understanding on the functions of securities exchange board of India, guidelines and the functions of credit rating	K2
CO 5	To increase the awareness in the areas of stock exchange, brokers and their assistants –On line trading, speculative transactions and Stock indices	K4

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	2	1	3	3	3	3	2	1	2		29
CO2	2	3	2	2	3	3	3	2	3	2	3			28
CO3	3	3	3	2	2	3	3	2	2	2	3	2	2	32
CO4	2	3	2	2	2	3	3	2	2	3	2	2	1	29
CO5	3	3	2	2	3	3	3	2	2	2	3	2	1	31
<b>Grand Total of COs with PSOs and POs</b>														<b>149</b>
<b>Mean Value of COs with PSOs and POs(149/62)</b>														<b>2.40</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.40
Observation	COs of Indian Financial System strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**

**DEPARTMENT OF COMMERCE**

**CLASS** : III BCOM CA

**PART** : Core Elective I

**SEMESTER** : V

**HOURS: 45**

**SUBJECT CODE: 22UCME15 (C)**

**CREDIT: 3**

**1. Title of the paper: Portfolio Management**

**2. Course Objectives:**

1. To understand the meaning and concept of the term portfolio management.
2. To get a wide knowledge about risk and return.
3. To Gain a depth knowledge on portfolio analysis.
4. To develop a strong understanding on various types of analysis.
5. To grasp the portfolio selection and management.

**3. Five Units of syllabus:**

<b>UNIT</b>	<b>CONTENT</b>	<b>HOURS</b>
<b>I</b>	<b>Introduction</b> Portfolio -Meaning – Objectives -Terms Relating to Portfolio– Role of Portfolio Managers - Portfolio Management vs Wealth Management – Introduction to Derivatives -Futures Options -Swaps -SEBI Regulations Relating to Portfolio Operations	<b>9</b>
<b>II</b>	<b>Risk &amp; Return</b> Concepts of Risk, Return, Uncertainty Risk and Return Relationship Components of Return – Risk Elements – Systematic and Unsystematic Risks	<b>9</b>
<b>III</b>	<b>Portfolio Analysis</b> Planning- Selection –Evaluation-Revision-Variou-Steps involved in Portfolio Development Theories relating to Portfolio Analysis	<b>9</b>
<b>IV</b>	<b>Fundamental Analysis</b> Fundamental Analysis – Economic Analysis – Industry Analysis and Company Analysis, Technical Analysis; Dow Theory, Elliott Wave Theory, Charting, Efficient Market Hypothesis.	<b>9</b>
<b>V</b>	<b>PORTFOLIO SELECTION &amp; MANAGEMENT: AN OVERVIEW (Theory only)</b> Efficient Market Theory, Random Walk Theory, Portfolio Risk/Return, Traditional portfolio Selection, Capital Assets Pricing Model, Growth investing, Value investing.	<b>9</b>

**Book for Study**

1. Punithaathi Pandian – Security Analysis & Portfolio Management, Vikas Publishing House
2. Gurusamy S, Security Analysis and Portfolio Management, Vijay Nicole Imprints
3. Francis Management of Investments

**5. Books for Reference:**

1. V.K. Bhalla – Investment Management S Chand & Co
2. Fisher & Jordan – Security Analysis & Portfolio Management

**6. Teaching Learning Method**

1. PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion.

## 7. Course Outcome (CO):

1. After Completion of the Course Portfolio Management the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the basic concepts in portfolio management.	K1
CO 2	Gain a comprehensive knowledge on risk and return of portfolio.	K2
CO 3	Plan and analyse the portfolio.	K3
CO 4	Identify the various analysis of portfolio	K4
CO 5	Get a wide knowledge on the selection of ideal portfolio	K3

K1=Knowledge      K2=Understanding      K3=Application      K4=Analysis  
K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	3	2	2	3	3	2	3	2	1			27
CO2	3	3	3	3	2	3	2	2	2		-	2	2	27
CO3	3	3	2	2	3	3	3	3			2	2	1	27
CO4	3	3	3	3	3	3	2	1	2	1	2	-	-	26
CO5	3	3	1	3	2	3	3	2	1	2	1		1	25
<b>Grand Total of COs with PSOs and POs</b>														<b>132</b>
<b>Mean Value of COs with PSOs and POs(132/56)</b>														<b>2.35</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.35
Observation	COs of Portfolio Management strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

**Class : III- B.Com**  
**Semester : V**  
**Subject code : 22UCMSL5**

**Part : S.L.C.**  
**Hours :**  
**Credits : 03**

**1. Title of the Paper : Business Environment**

**2. Course Objectives (CO)**

1. To give an overview of business management.
2. To study the Provisions of Indian constitution pertaining to business.
3. To understand the economic environment.
4. To study natural and technological environment.
5. To study the financial environment.

**3. Five units of the Syllabus:**

UNIT	CONTENT	HOURS
I	An overview of business environment: Concept of business environment: nature of business environment; significance of business environment. A brief overview of business environments and their impact on business-political environment-socio-cultural environment-legal environment-economic environment.	
II	Political Environment: Political Environment-Government and business relationship in India-Provisions of Indian constitution pertaining to business. Legal environment: classification of laws: Companies Act: IRDA: Consumer protection Act: FEMA	
III	Economic environment: Economic environment-Economic systems: Macroeconomic parameters and their impact on business-GDP/GWP and per capita income; Population; urbanization; Fiscal deficit: Five year planning.	
IV	Natural and Technological Environment : Innovation, technological leadership and followership, sources of technological dynamics, impact of technology on globalization, transfer of technology, time lags in technology introduction, Status of technology in India; Management of technology; Features and Impact of technology.	
V	Financial environment: The financial system - Financial institutions: Commercial Banks: RBI: Stock Exchange: Capital market reforms and development; SICA and BIFR: non-Banking Financial companies (NBFCs)	

**4. Books for Study:**

1. Francis Cherunillum, 2003, Business Environment, Himalaya Publishing House, Mumbai

### 5. Books for Reference:

1. Raj Agarwal, 2002, Business Environment, Excel Books.
2. Francis Cherunillam, 2006, Business Environment, Text and Cases, H.P.H. Syllabus

### 6. Teaching Learning Methods:

Giving Guidance, providing materials

### 7. Course Outcome (CO):

After Completion of the Course Business Environment the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Explain the concept of the various constituents of environment and their impact on businesses.	K3
CO 2	Able to understand the political environment.	K2
CO 3	Gain knowledge on the economic environment	K1
CO 4	Upgradation of technological environment	K3
CO 5	Able to get wider knowledge of Financial system	K1

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	1	1	-	3	3	-	1	-	3	2		20
CO2	3	3	2	1	1	3	2	1	-	-	2	2	1	21
CO3	3	3	2	2	-	3	1	-	1	3	-	1	-	19
CO4	3	3	1	3	1	3	2	2	-	-		1	2	21
CO5	3	2	-	2	3	3	2	2	3	1				21
<b>Grand Total of COs with PSOs and POs</b>														<b>102</b>
<b>Mean Value of COs with PSOs and POs(102/48)</b>														<b>2.12</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.12
Observation	COs of Business Environment strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

Class : III B.Com CA  
Semester : VI  
Subject Code : 22UCMD66

Part : Core 16  
Hours : 30  
Credits : 02

**1. Title of the Paper: Accounting Package**

**2. Course Objectives (CO):**

1. To expose the students to Computer Applications in the field of Accounting.
2. To develop the skills of recording a financial transaction into the books of accounts.
3. To impart the knowledge regarding the creation inventory details.
4. To impart comprehensive knowledge on Tally with GST.
5. To develop practical skills to generate payroll slip.

**3. Five units of the Syllabus**

UNITS	CONTENT	HOURS
<b>I</b>	Introduction to Computerized Accounting – Computerized Accounting Vs. Manual Accounting – Merits of Computerized Accounting – Tally ERP9 –Features of Tally ERP 9 – Screen Components – Creation of Company – Selecting a Company – Altering/Modifying Company Creation Details – Deleting a Company – F11 Features – F 12 Configuration.	<b>6</b>
<b>II</b>	Accounts and Voucher — creation of groups (single and multiple groups) – creation of ledger (single and multiple) – display ledger accounts –Voucher types ; creation of voucher – voucher entry; configuration accounts vouchers – cost categories (single and multiple) Cost centres (single and multiple) - Generating Reports - Configuring reports - Balance Sheet - Profit and Loss Account - Trial Balance - Day books - Account Books - Statement of Accounts .	<b>6</b>
<b>III</b>	Inventory and Voucher; stock groups (single and multiple) – stock categories (single and multiple) – Stock items (single and multiple) – display, alter, deletion. God owns; creation of god owns (single and multiple) – unit of measures (single and compound) – display, alter, deletion. Inventory vouchers –common information - voucher types. Inventory Reports - Stock Summary - Inventory Books - Statement of Inventory.	<b>6</b>
<b>IV</b>	GST Taxes and Invoices - Understanding SGST,CGST and IGST , Setting up GST at Ledger level - vouchers - Default Vouchers - Creating a new Voucher type- Various voucher like Receipts, Payments, Journal etc. Inventory Details in vouchers - Setting up GST at Inventory level - Receipt note - Delivery note - Rejections.	<b>6</b>

<b>V</b>	Payroll: Enabling payroll - Creating Pay Heads - Single/Multiple Creation of Employee Groups - Single/Multiple Creation of employee head - Salary details - Configuration of salary details - Creating units of work - Managing and creating attendance/Production types - F 12 payroll configuration - payroll voucher -Generating a Sample Pay Slip.	<b>6</b>
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**4. Books for Study:**

Nandhini.A. K. Implementing Tally-9”, COP Publications, New Delhi

**5. Books for Reference:**

Tally Institute materials.

**6. Teaching Learning Methods:**

Chalk &Board ,Power Point Presentation, Group Discussion, Brain Storming, Quiz, Students Staging Presentation, Assignments, etc....

**7. Course Outcome (CO):**

After Completion of the Course Accounting Package the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom’s Taxonomy)
CO 1	understand the basic knowledge on creation of company in Tally software	K2
CO 2	Develop a Strong knowledge on ledger ,Group creation and Voucher creation	K1
CO 3	Develop to create the Inventory vouchers.	K2
CO 4	Familiarize the students on Tally with GST	K3
CO 5	Generation of Payroll Slip.	K4

K1=Knowledge      K2=Understanding      K3=Application      K4=Analysis  
K5=Synthesis

**Mapping of COs with PSOs and POs**

Objectives	PSO	PSO	PSO	PSO	PSO	PO	Sum of COs with PSOs and POs							
	1	2	3	4	5	1	2	3	4	5	6	7	8	
CO1	3	3	3	2	3	3	2	3	3	3	1		2	31
CO2	3	3	3	2	2	3	2	2	2	1	-	2	2	27
CO3	3	3	3	3	3	3	3	3	2	2	2	2	1	33
CO4	3	3	3	2	2	3	2	3		2	2	3	-	28
CO5	3	3	2	2	2	3	2	2	2	1	3	2	1	28
<b>Grand Total of COs with PSOs and POs</b>														<b>147</b>
<b>Mean Value of COs with PSOs and POs(147/61)</b>														<b>2.40</b>

**Strong -3, Medium -2, Low-1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean value of COs with PSOs and POs</b>			<b>2.40</b>
<b>Observation</b>	<b>COs of Accounting Package strongly related with PSOs and POs</b>		

**ARULANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

Class	: III B.Com CA	Part	: Core Lab-6
Semester	: VI	Hours	: 60
Subject Code	: 22UCMP66	Credits	: 02

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**LAB CYCLE FOR ACCOUNTING PACKAGE**

**Objective:**

**To Develop Comprehensive knowledge on Tally with GST**

1. Creation of Company
2. Creation of Account Group
3. Creation of Ledger Accounts
4. Creation of Cost categories
5. Creation of Cost centers
6. Creation of Voucher with GST
7. Voucher Transaction
8. Voucher Transaction displaying Book
9. Creation of Stock group and categories
10. Creation of stock items
11. Creation of God owns
12. Creation of units of measures
13. Maintaining accounts with inventory
14. Creation inventory vouchers With GST
15. Generating a pay slip

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**

**DEPARTMENT OF COMMERCE**

**Class : III B.Com CA**

**Part : Core 17**

**Semester : VI**

**Hours : 75**

**Subject Code : 22UCMD76**

**Credits : 04**

**INCOME TAX LAW AND PRACTICE**

**1. Title of the Paper: Income tax law and practice**

**2. Course Objectives (CO):**

1. Understand the definitions, basic concepts and classification of different heads.
2. Identify the different forms of salary and house property.
3. Evaluate the business or profession.
4. Comprehend the capital gain and other sources.
5. Acquaint with the Gross total Income, Total Income and Tax Liability.

**3. Five Units of Syllabus**

<b>UNITS</b>	<b>CONTENT</b>	<b>HOURS</b>
<b>I</b>	The Income Tax Act -Definition of Income -Assessment Year -Previous Year -Assessee –Types of Assessee -Scope of Income -Charge of Tax -Residential Status.	<b>15</b>
<b>II</b>	Computation of Income from salaries –Different forms of salary–allowances, perquisites and their types and treatment –Profits in lieu of salary and exempted profits –Deductions U/S 16- Income from House property –Let out property-Self occupied - Properties - Computation of income from house property.	<b>15</b>
<b>III</b>	Income from Business or Profession -Meaning of Business or Profession -Computation of Profits and Gains of Business or Profession of an Individual-Expenses Expressly Allowed -Expenses Expressly Disallowed.	<b>15</b>
<b>IV</b>	Income from Capital Gains -Computation of Capital Gains-capital gains exempted u/s 10-Income from Other Sources -Computation of Income from Other Sources- – Winning from lotteries, puzzles, card games.	<b>15</b>
<b>V</b>	Deduction u/s 80C TO 80U-Computation of Gross total Income-Computation of Total Income-Agriculture Income-Tax Liability or Tax payable - TDS.	<b>15</b>

**4. Text Book:**

1. Dr.Hariharan.N, Income Tax Law and Practice, Dr.H.C. Mehrotra& D.S.P., Goyal, 62<sup>nd</sup> edition, SahityaBhawan Publications.

## 5. Reference Books:

1. Dr.R.G.Saha,Dr.UshaDevi.N, Current edition,“Income Tax”, Himalaya Publishing House, Mumbai.
2. Vinod Singhanian&, Kapilsinghanian, Monica Singhanian, Current edition, “Direct taxes”, Kalyani Publishers, New Delhi.

## 6. Teaching Learning Methods

Power Point Presentation, Group Discussion, Assignment, chalk and talk method

## 7. Course Outcome (CO):

After Completion of the Course Income Tax Law and Practice the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom’s Taxonomy)
CO 1	To define the basic concepts of income tax	K1
CO 2	To identify the forms of salaries and House property.	K2
CO 3	To assess the students on understanding concepts	K3
CO 4	To compute the Capital gains and other sources.	K4
CO 5	To Evaluate the Gross total Income, Total Income and Tax Liability.	K5

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	2	3	3	3	3	3	3	1	3	3	3	1	-	31
CO2	2	3	3	3	3	3	2	1	3	3	2	-	2	30
CO3	2	3	-	2	-	3	3	1	3	3	1	2	2	25
CO4	3	3	-	3	2	3	3	3	3	3	3	1	-	30
CO5	3	3	2	1	-	-	3	3	3	2	2	3	-	25
<b>Grand Total of COs with PSOs and POs</b>														<b>141</b>
<b>Mean Value of COs with PSOs and POs(141/56)</b>														<b>2.51</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.51
Observation	COs of Income Tax Law and Practice strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

Class : B.Com CA	Part : Core-18
Semester : VI	Hours : 75
Subject Code : 22UCMD86	Credits : 05

**1. Title of the paper: Management Accounting**

**Course Objective (CO):**

1. To enlighten the students thought and knowledge on management Accounting
2. To imbibe the concept of working capital.
3. To impart the students on Financial Statement Analysis with the emphasis on the preparation of fund flow and cash flow statement.
4. To provide knowledge about budget control keeping in mind the scope of the concept.
5. To develop the know-how and concept of marginal costing and standard costing

**2. Five Units of Syllabus:**

UNITS	CONTENT	HOURS
<b>I</b>	Management Accounting – meaning, nature, scope, functions and objectives Ratio analysis – advantages – classifications of ratios – profitability ratios, liquidity ratios, Solvency ratios and Turn over ratios.	<b>15</b>
<b>II</b>	Working capital - concept- composition-Nature - importance and types of working capital- Difference sources of working capital-working capital forecasting.	<b>15</b>
<b>III</b>	Fund Flow Statement and cash Flow Statement – Meaning significance and preparation.	<b>15</b>
<b>IV</b>	Budgetary Control –meaning, objectives – types of Budgets – Fixed and flexible budgets – cash and sales budgets – zero based budgeting	<b>15</b>
<b>V</b>	Marginal Costing – Meaning, Definition – preparation of marginal cost statement, Applications. (Break Even Analysis, profit volume analysis) Standard Costing – Meaning, Objectives – variance analysis – Material, Labour, overhead variances	<b>15</b>

**4. Text Book:**

1. S. Reddy and Dr.A. Murthy 2018, "Management Accounting" Margham Publications, Chennai.

**5. Reference Books:**

1. Ramachandran.R and Srinivasan.R, 2010" Management Accounting", Sriram Publications, Tennur, Trichy.
2. Guru Prasad Murthy, 2006, "Management Accounting", Himalaya publishing house, Bombay.
3. Pillai R.S.N and Bagavathi, 2007 " Management Accounting"

## 6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk

## 7. Course Outcome (CO):

After Completion of the Course Management Accounting the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Develop the clear knowledge on management Accounting.	K2
CO 2	Manage working capital	K2
CO 3	Grasp practical training on cash flow and fund flow statement approach;	K3
CO 4	Obtain knowledge about budget control.	K3
CO 5	Expertise in the marginal costing and standard costing techniques.	K3

K1=Knowledge      K2=Understanding      K3=Application      K4=Analysis  
K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	1		3	3	3		1	1	1		22
CO2	3	3	3	2	3	3	3	2	3	2	2	1	2	32
CO3	3	3	2	3	2	3	3	2	3	3	2	1	1	31
CO4	3	3	2	3	2	3	3	3	2	3	3	2	1	33
CO5	3	3	1	1		3	3	1	1		3	3	2	24
<b>Grand Total of COs with PSOs and POs</b>														<b>142</b>
<b>Mean Value of COs with PSOs and POs(/60)</b>														<b>2.36</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.36
Observation	COs of Management Accounting strongly related with PSOs and POs		

**ARULANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

<b>Class</b> : III B.Com CA	<b>Part</b> : Core 19
<b>Semester</b> : VI	<b>Hours</b> : 75
<b>Subject Code</b> : 22UCMD96	<b>Credits</b> : 04

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**1. Title of the paper:** Commercial Law

**2. Course Objectives (CO):**

To make the students

1. To Understand the basic principles and origin in the area of commercial law
2. To Obtain knowledge on bailment and pledge in the business
3. To Impart knowledge of sale of goods Acts
4. To understand the different types of liabilities, duties and rights of an agency.
5. To Aware of rights of women in the company.

**3. Five units of the Syllabus:**

UNITS	CONTENT	HOURS
<b>I</b>	Contract Act (Sec.1 to 75): Essentials of Valid contract-Offer-Acceptance Consideration, Capacity of Parties-Free Consent-Contingent agreement contract- Performance of Contract-Discharge of contract-breach of contract-Remedies for breach of contract. Contract of indemnity and guarantee.	<b>15</b>
<b>II</b>	Bailment and pledge(sec.148 to 181): Essentials – Rights and Duties of bailer and Bailee-termination of bailment- pledge-rights and duties of pledge- pledge by non owners- pledge distinguished from Mortgage- Finder of lost in goods	<b>15</b>
<b>III</b>	Sale of Goods Act(Sec.1 to 62): 'Delivery'. Documents of the title of goods, Bill of lading, Delivery order – formation of contract of sale -Distinction between sale and agreement to sell- Sale and Hire purchase- Essentials of sale- rights and duties of seller and Buyer- Rights of an unpaid seller- Quasi Contract	<b>15</b>
<b>IV</b>	Law of Agency: Meaning – Nature of Agency - Different kinds of Agents-methods of creating Agency-Extent of Agents Authority-Termination of Agency. Conditions and Warranties- Transfer of property in and title of goods. Duties, rights and responsibilities of an Agent.	<b>15</b>
<b>V</b>	Rights of women in the company: Rights to equal remuneration and opportunities (Equal Remuneration Act, 1976)- Right to harassment-free work environment (Sexual Harassment of Women at Workplace Act,2013)- Maternity benefit and Protection of employment (Maternity Benefit Act,1961)- Health and safety (The Factory Act,1948)-Mandatory board representation (Companies Act,2013)-Minimum wages Act,1948.	<b>15</b>

**4. Text Book:**

1. Kapoor.N.D, 2006, "Elements of Mercantile Law", Sulthan& Chand, New Delhi.

### 5. Reference Book:

1. Sundaram KPM & Varshney, "Introduction to Commercial Law", Kalyani Publications, New Delhi.
2. RSN Pillai and Bagavathi., Business Law, S.Chand, Delhi.
3. Ravinder Kumar and Virender Sharma, Practical Auditing, Prentice Hall of India Pvt. Ltd., New Delhi, 2012.

### 6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk,

### 7. Course Outcome: (CO)

After Completion of the Course Commercial Law the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Student could define the basic terms and be aware of the basic principles of commercial law.	K1
CO 2	Student will be able to know the duties and rights of bailer and Bailee	K1 & K4
CO 3	Student get to understand the delivery documents of sale of goods Acts, rights and duties of seller and buyer	K3
CO 4	Student can explain the different types of liabilities, duties and rights of an agency	K2
CO 5	Acquire knowledge on the rights of women in the company.	K4

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	1	1	-	3	3	-	1	-	3	2	3	23
CO2	3	3	2	1	1	3	2	1	-	-	2	2	1	21
CO3	3	3	2	2	-	3	1	-	1	3	-	1	-	19
CO4	3	3	1	3	1	3	2	2	-	-	3	1	2	24
CO5	3	2	-	2	3	3	2	2	3	1	3	-	3	27
<b>Grand Total of COs with PSOs and POs</b>														<b>114</b>
<b>Mean Value of COs with PSOs and POs(114/51)</b>														<b>2.23</b>

Strong -3, Medium -2, Low-1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean value of COs with PSOs and POs</b>			<b>2.23</b>
<b>Observation</b>	<b>COs of Commercial Law strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATIONS**

Class : III BCOM  
 Semester : VI  
 Subject Code : 22UCME26 (A)

Part : Core Elective II  
 Hours : 45  
 Credit : 03

**HUMAN RESOURCE MANAGEMENT**

**1. Title of the Paper: Human Resource Management**

**2. Course Objectives (CO):**

1. Understand the basic concepts of Management and to study the contribution of management expert and their role.
2. Understand the organization structure, staffing and selection.
3. Preparation of training and its development and to evaluate the performance appraisal.
4. To enhance the knowledge about Human resource accounting and auditing.
5. Describe the wages and salary administration

**4. Five Units of syllabus:**

UNITS	CONTENT	HOURS
<b>I</b>	<b>Human Resources Management:</b> Meaning- Features- Scope and Functions of Human Resource Management-History of Human Resource Management- Role of HR Manager.-Human Resource accounting-E-HRM	<b>9</b>
<b>II</b>	<b>Job analysis &amp; Job description and Job specification:</b> Recruitment – concept and sources- Selection–Concept and Process- Test and Interview-Placement-induction-socialization- Retention.	<b>9</b>
<b>III</b>	<b>Training and Development:</b> Concept and importance- Training and development methods – Principles of Executive Development. <b>Performance Appraisal: Concept-</b> objectives- importance- methods of performance appraisal- transfer and promotions.	<b>9</b>
<b>IV</b>	<b>Human resource accounting and audit:</b> Human resource accounting -Meaning-Objectives-Need and limitations. Human resource audit-Nature-Benefits-Scope-Approaches	<b>9</b>
<b>V</b>	<b>Compensation Management:</b> Wage and salary administration-managing wages- concept of rewards- methods of fixing remuneration- incentives-security measure - Methods of fixing remuneration- Incentives -Security Measures -Employer - Employee Relations.	<b>9</b>

**4. Text Book:**

1. Gupta .C.B., 2012, “Human Resource Management”, Sulthan Chand and Sons, New Delhi.

### 5. Reference Books:

1. SubbaRao. P, 2009, "Personnel and Human Resource Management", Himalaya Publishing House, New Delhi.
2. Tripathi.P.C, 1997, "Personnel Management", Dominant Publishers and Distributors.

### 6. Teaching Learning methods:

PPT, Lecture, Test, Assignment

### 7. Course Outcome (CO):

After Completion of the Course Human Resource Management the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Identify the basic principles and functions of management in functional areas of business and understand the contributions of experts to management thought.	K1&K2
CO 2	Develop the skills in job analysis and description.	K2
CO 3	Understand the training and development.	K2
CO 4	Evaluate the human resource accounting and audit.	K3
CO 5	understand the Wage and salary administration- managing wages- concept of rewards	K4

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	2	3	-	3	3	2	3	2	-	1	1	26
CO2	3	3	3	3	2	3	2	2	1		2	-	-	24
CO3	3	3	3	-	2	3	3	-	2	2	-	2	-	23
CO4	3	2	3	3	-	3	2	2	-	2	2	-	2	24
CO5	3	3	3	2	3	3	2	2	1	2	-	-	2	26
<b>Grand Total of COs with PSOs and POs</b>														<b>123</b>
<b>Mean Value of COs with PSOs and POs(123/51)</b>														<b>2.41</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.41
Observation	COs of Human Resource Management strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATIONS

Class : B.Com CA

Part : Core Elective-II

Semester : VI

Hours : 45

Subject Code : 22UCME26 (B)

Credit : 3

**1. Title of the Paper: ADVERTISEMENT AND SALESMANSHIP**

**2. Course Educational Objectives (CEO):**

- 1.To help the students to understand the advertising.
2. To make the students to plan for advertising.
- 3.To acquire the skill of advertisement budget and to learn ethics in advertising.
4. To Know salesmanship.
5. To learn selection and appointment of salesmanship.

**3. Five units of Syllabus:**

Unit	Content	Hours
1.	<b>Advertising</b> :Meaning, Definition and concept of advertisement. Means and types of advertising – commercial and non-commercial advertising, Objectives and functions of advertising	9
2.	<b>Planning For Advertising:</b> Strategic planning - Marketing plan - Advertising objectives - Communication response pyramid - Advertising Department - Organizing for advertising department - Functions of advertising management.	9
3.	<b>Advertisement Budget &amp; Ethics in Advertising:</b> Setting of advertising budget Factors affecting expenditures in a company. Ethics and code of conduct in advertising.	9
4.	<b>Salesmanship</b> : Meaning, Definition - Main elements of salesmanship - Advantages - Buying motives- Selling process	9
5.	<b>Saleman</b> - Meaning - Types - Qualities of salesman - Selection and appointment of salesmanship -Training , remuneration of salesmanship - Power of salesman.	9

**4.Text Book**

- 1.Advertising & Promotion: Belch & Belch, Tata McGraw Hill

**5. Book for References:**

1. Advertising: Sontakki, Himalaya Publishing House
2. Advertising Planning and implementation: Sharma and Singh, Prentice Hall
3. Advertising Management Concepts and Cases: Mahendra Mohan, Tata McGraw Hill
4. Promotion Management: Burnelt, Tata McGraw Hill.

**6. Teaching Methodology:**

PPT, Group Discussion, Chalk and Board and videos.

### 7. Course Outcomes (CO):

After Completion of the Course Advertisement and Salesmanship the students will be able to

S.No	Course Outcomes	Hours
1.	Familiarize the concept of advertising.	K1
2.	Make planning for advertisement.	K3
3.	Identify the best advertisement budget and learn ethics in advertising	K3
4.	Recognize the importance of salesmanship.	K3
5.	Know the process of selection and appointment of salesmanship.	K3

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	2	2	3	3	3	2	2	2	3	2	2	32
CO2	3	3	2	2	1	3	2	2	3		2	3	2	28
CO3	3	3	2		1	3	3	2	1		2	2	2	24
CO4	3	3	3	1	1	3	3	3	1	1		2	2	26
CO5	3	3	3	3	3	2	3	3	3	2	2	3	3	36
<b>Grand Total of COs with PSOs and POs</b>														<b>146</b>
<b>Mean Value of COs with PSOs and POs(146/61)</b>														<b>2.39</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.39
Observation	COs of Advertisement and Salesmanship Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATIONS

Class : B.Com CA

Part : Core Elective-II

Semester : VI

Hours : 45

Subject Code : 22UCME26 (B)

Credit : 3

**1. Title of the Paper: Services Marketing**

**2. Course Educational Objectives (CEO):**

1. To help the students to understand the critical role of services marketing,
2. To enable the students to know the various concepts of services marketing like service quality, service triangle.
3. To highlights the conceptual framework of the principles, practices.
4. To acquire the techniques
5. To face the challenges to the services marketing in the global era.

**3. Five units of Syllabus:**

Unit	Content	Hours
1.	Services Marketing – Introduction – meaning – definitions – concept, Components and of Services – Services (or) Goods, Characteristics of Services and their Marketing implications – Product Support services – Pricing of Services – Innovation in Services.	9
2.	Service Quality – Service quality gap –Service quality audit – SERVQUAL –Services triangle Marketing Strategies for service firms –Information technology, Mass Communication.	9
3.	Marketing of Financial Services –Insurance, Mutual funds, Banking –Factoring –Marketing of Educational Services	9
4.	Health care Marketing – Hospitality and tourism Services – Entertainment Marketing – Transport Marketing – Day care Marketing	9
5.	CRM – Transaction Marketing (or) Relationships Marketing – Objectives of CRM – Implementing– Requisites for implementation of CRM – Levels of Relationship Strategies Tele communication marketing	9

**4. Book for References:**

1. Jochenwirtg , Christopher Lovelock, services Marketing, World Scientific Publishing, (US), 2016
2. S.L. Gupta, Marketing of Services, International Book House, 2012
3. S.M. Jha, Services Marketing, Himalaya Publishing House, New Delhi, 2013
4. Vasnathi Venugopal, Raghu VN , "Services Marketing" Himalaya Publishing house 2012.
5. SM.Jha, "ServicesMarketing"Himalaya Publishing House 2008.

**5. Teaching Methodology:**

PPT, Group Discussion, Chalk and Board and videos.

## 6. Course Outcomes (CO):

After Completion of the Course Services Marketing the students will be

S.No	Course Outcomes	Hours
1.	Familiarize the concept, components and classification of services.	K1
2.	Describe service quality gap, audit, and marketing strategies for service firms	K3
3.	Identify the various Marketing financial services	K3
4.	Recognize the Health care, tourism, and Day care marketing	K3
5.	the objectives and implementation of customer relationship management and responsible marketing on services managers	K3

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	2	2	3	3	3	2	2	2	3	2	2	32
CO2	3	3	2	2	1	3	2	2	3		2	3	2	28
CO3	3	3	2		1	3	3	2	1		2	2	2	24
CO4	3	3	3	1	1	3	3	3	1	1		2	2	26
CO5	3	3	3	3	3	2	3	3	3	2	2	3	3	36
<b>Grand Total of COs with PSOs and POs</b>														<b>146</b>
<b>Mean Value of COs with PSOs and POs(146/61)</b>														<b>2.39</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.39
Observation	COs of Services Marketing Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF COMMERCE**

Class : III B. Com CA  
Semester : VI  
Subject Code : 22UCMSL6

Part : S.L.C  
Hours :  
Credit : 3

**1. Title of the Paper: Sales Promotion**

**2. Course Objectives (CO):**

1. To give students understanding about the various forms of sales promotion
2. To study the tools of sales promotion
3. To learn the sales promotion programme.
4. To understand the salesmanship and sales operations
5. To study the legal and ethical aspects of sales promotion

**3. Five units of the Syllabus:**

UNITS	CONTENT	HOURS
I	Nature and importance of sales promotion, its role in marketing - Forms of sales promotions - Consumer oriented sales promotion; trade oriented sales promotion & Sales force-oriented sales promotion.	
II	Tools of sales promotion- samples point of purchase, displays & demonstrations, exhibitions & fashion shows, sales contests & games of chance and skill, lotteries gifts offers, premium and free goods, price packs, rebates patronage rewards, Conventions, conference & trade shows, specialties and novelties.	
III	Developing sales promotion programme, pre-testing implementing, evaluation of results and making necessary modifications.	
IV	Salesmanship and Sales Operations: Types of Salesman - Prospecting - Pre-approach and Approach - Selling Sequence - Sales budget, Sales territories, Sales Quota's - Point of Sale – Sales Contests - Coupons and Discounts - Free Offers - Showrooms and Exhibitions - Sales Manager Qualities and functions.	
V	Ethical and legal aspects of sales promotion and public relations.	

**4. Books for Study:**

1. Wells, Moriarty & Burnett, Advertising, Principles & Practice, Pearson Education 7th Edition, 2007.
2. Kenneth Clow. Donald Baack, Integrated Advertisements, Promotion and Marketing Communication, Prentice Hall of India, New Delhi, 2003.

**5. Books for Reference:**

1. S. H. H. Kazmi and Satish K Batra, Advertising & Sales Promotion, Excel Books, New Delhi, 2001.

2. George E Belch and Michel A Belch, Advertising & Promotion, McGraw Hill, Singapore, 1998.
3. Julian Cummings, Sales Promotion, Kogan Page, London, 1998. Syllabus

### 6. Teaching Learning Methods:

Giving Guidance, provide study material

### 7. Course Outcome (CO):

After Completion of the Course Sales Promotion the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Describe the importance of sales promotion	K1
CO 2	Get an idea about tools of sales promotion	K2
CO 3	Develop sales promotion programme	K3
CO 4	Grasp salesmanship and sales operations.	K3
CO 5	Acquire knowledge on ethical and legal aspects of sales promotion	K2

K1=Knowledge      K2=Understanding      K3=Application      K4=Analysis  
K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	1	1	-	3	3	-	1	-	3	2	1	21
CO2	3	3	2	1	1	3	2	1	-	-	2	2	1	21
CO3	3	3	2	2	-	3	1	-	1	3	-	1	-	19
CO4	3	3	1	3	1	3	2	2	-	-		1	2	21
CO5	3	2	-	2	3	3	2	2	3	1			2	23
<b>Grand Total of COs with PSOs and POs</b>														<b>105</b>
<b>Mean Value of COs with PSOs and POs(105/50)</b>														<b>2.1</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs		2.00	2.1
Observation	COs of Sales Promotion strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS),  
KARUMATHUR – 625 514  
B.COM WITH CA  
CBCS STRUCTURE (For 2023-24 onwards)**

<b>I SEMESTER</b>				
<b>PART</b>	<b>SUBJECTCODE</b>	<b>PAPER</b>	<b>Hrs</b>	<b>Cr</b>
I	22UTML11/ 22UHNL11/ 22UFNL11	Tamil/Hindi/French	06	04
II	22UENB11	English through Prose & Short Story(StreamB)	05	04
III		Core		
	22UCMC11	Financial Accounting-I	06	05
	22UCMC21	Computer Application in Business -Theory	03	03
	22UCMP11	Practical	03	02
IV	22UCMA11	Allied-I Business Economics	05	04
	22UFCE11	FC- Personality Development	01	01
	22UCSH12	Communication Skill	01	
V	22UBRC11	Bridge Course	-	01
	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC /NSS /Phy.Edn./ YRC/ ROTARACT/ AICUF/NCB	---	---
		Total	30	24
<b>II SEMESTER</b>				
I	22UTML22/ 22UHNL22/ 22UFNL22	Tamil/Hindi/French	06	04
II	22UENB22	English through Prose & Poetry (StreamB)	05	04
III		Core		
	22UCMC32	Financial Accounting –II	06	04
	22UCMC42	Business Application Programming–Theory	03	03
	22UCMP22	Practical	03	02
	22UCMA22	Allied –II Principles of Marketing	05	04
IV	22UFCH22	FC-Social Responsibility and Global Citizenship	01	01
	22UCSH12	Communication Skill	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC/NSS/Phy.Edn./YRCROTARACT/AICUF/NCB	--	01
		Total	30	24
<b>III SEMESTER</b>				
		<b>TAMIL</b>	06	05
III		Core		
	22UCMC53	Partnership Accounts	06	05
	22UCMC63	Information Technology-Theory	03	02
	22UCMP33	Practical	03	02
	22UCMA33	Allied–III Business Mathematics	05	04

IV	22UCMN13	Basic Tamil/Advanced Tamil Non Major Elective to Science Students - Principles of Accountancy	03	02
		<b>SBE-I Practical Banking</b>	03	02
	22UFCE33	FC-Environmental Studies	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NCC/NSS/Phy.Edn./YRCROTARACT/AICUF/NCB	---	---
	22UARE14	ARISE	----	---
		Total	30	22

**IV SEMESTER**

		<b>TAMIL</b>	06	05
III		Core		
		<b>Corporate Accounting</b>	06	05
	22UCMC94	E-Commerce-Theory Practical	03	02
	22UCMP44		03	02
	22UCMA44	Allied IV-Business Statistics	05	04
IV	22UCMN24	Non Major Elective to Arts Students-- 1.AptitudeTechniquesforCompetitiveExams	03	02
	22UCMS24	SBEII-Entrepreneurship Development	03	02
	22UFCH44	FC-Religious Literacy and Peace Ethics	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NCC/NSS/Phy.Edn./YRCROTARACT/AICUF/NCB	---	01
	22UARE14	ARISE	---	01
		Total	30	24

**V SEMESTER**

III		Core		
	22UCMD15	Cost Accounting	05	04
	22UCMD25	Programming With JAVA-Theory Practical	03	03
	22UCMP55		03	02
	22UCMD35	Auditing	05	04
	22UCMD45	International Business	04	04
		<b>Business Management</b>	05	04
	22UCME15	Core Elective I – Investment Management Indian Financial Services Portfolio Management	03	03

IV	22UINT15	Internship(Holidays)	-	01
	22USSI16	Soft Skills	02	--
		Total	30	25

**VI SEMESTER**

		Core		
	22UCMD66	Accounting Package-Theory	02	02

III	22UCMP66	Practical	04	02
	22UCMD76	Income Tax Law and Practice	05	04
	22UCMD86	Management Accounting	05	05
	22UCMD96	Commercial Law	05	04
	22UCMT06	Institutional Training	04	03
	22UCME26	Core Elective- II - Human Resource Management Advertising and Salesmanship Services Marketing	03	03
IV	22USSI16	Soft Skills	02	02
		Total	30	25

Semester	I	II	III	IV	V	VI	Total
Credits	24	24	22	24	25	25	144

**Self Learning Courses-Additional Credits**

Semester	Credits
III	3
IV	3
V	3
VI	3

Semester : ODD

Hours : 30

Sub. Code : 23VCOO1

**1. Title of the paper : Advanced Excel****2. Course Objectives (CO)**

1. To understand the excel formulas and functions
2. To learn how to create tables and manipulate the data within the tables.
3. To enlighten the knowledge to import and access the database from Web.

**3. Five units of the Syllabus:**

UNITS	CONTENT	HOURS
I	<b>Excel Formulas and Functions:</b> Inserting and Editing a Function-Auto Calculate and Manual Calculation-Using Logical Functions (IF)-Using Financial Functions (PMT)-Using Database Functions (DSUM)-Using Lookup Functions (VLOOKUP)-User Defined and Compatibility Functions- Financial Functions-Date & Time Functions-Math & Trig Functions-Statistical Functions-Lookup & Reference Functions-Database Functions-Text Functions-Logical Functions	10
II	<b>Working with Data Ranges:</b> Sorting by One Column-Sorting by Colors or Icons-Sorting by Multiple Columns-Sorting by a Custom List-Filtering Data-Creating a Custom AutoFilter-Using an Advanced Filter-Working with Tables-Creating a Table-Adding and Removing Data-Working with the Total Row-Sorting a Table-Filtering a Table-Removing Duplicate Rows of Data-Formatting the Table-Using Data Validation-Summarizing a Table with a PivotTable	10
III	<b>Working with the Web and External Data:</b> Inserting a Hyperlink-Creating a Web Page from a Workbook-Importing Data from an Access Database or Text File-Importing Data from the Web and Other Sources-Working with Existing Data Connections	10

**4. Book for Study**

1. Manisha Nigam, "Data Analysis with Excel", BPP publications

**Reference Books:**

1. Financial Analysis and Modeling using Excel and VAB: Chandan Sengupta, Wiley
2. Excel Data Analysis – Modeling and Simulation: Hector Guerreor, Springer
3. Microsoft Excel 2013: Data Analysis and Business Modeling: Winston, PHI

**6. Teaching Learning Methods:**

Power Point Presentation, Group Discussion, Quiz, Assignments, etc....

## 7. Course Outcome (CO):

After Completion of the Course Advanced Excel the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the basic knowledge on Excel formulas and functions.	K2
CO 2	Working with data ranges	K2
CO 3	Working with the web and external data	K3

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	2	3	3	3	3	3	1	1	1	1	30
CO2	3	2	3	2	3	3	3	3	2	2	2	3	2	33
CO3	3	2	3	3	2	3	3	3	2	3	2	3	2	34
<b>Grand Total of COs with PSOs and POs</b>														<b>97</b>
<b>Mean Value of COs with PSOs and POs(97/39)</b>														<b>2.488</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.66
Observation	COs of Advanced Excel strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

**Semester : ODD**

**Hours : 30**

**Sub. Code : 23VCOO2**

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**1. Title of the paper : TALLY**

**2. Course Objectives:**

- Expose the Accounting Fundamentals
- Pass journals, prepare ledgers, Trial Balance .
- To impart the knowledge on Final Accounts
- Introduce Tally ERP as an accounting software package.
- To understand the creation of records of small trader.

**3. Five Units of syllabus:**

<b>S.No</b>	<b>Content</b>	<b>No of Hours</b>
1.	Principles of Accounting : Principles of Accounting – Accounting concepts and Conventions – Double entry system of book keeping.	6
2.	Journal and Ledger : Journal – Ledger-Subsidiary books - Trial balance	6
3.	Accounting for Sole Trading Concern : Final Accounts of Sole Trading Concern – Adjustments in the preparation of Final Accounts.	6
4.	Practical : Meaning – Creation of a company –creating groups and ledger-display of Trial Balance, Profit and loss and Balance sheet. Create stock – unit - Goodown.	6
5.	Accounting Voucher (Practical) : Creating accounting voucher for purchase, sales, debit note, credit note, payment and receipt voucher.	6

**4. Book for Study**

1. Advanced Accountancy, T.S.Reddy&A.Murthy, Margham Publications, 1st edition,2007
2. Nandhni.A. K. Implementing Tally-9”, COP Publications, New Delhi.

**5. Books for Reference:**

1. R.L. Gupta and Radhaswamy – Advanced Accountancy – Sulthan Chand and sons – New Delhi – 110002.
2. Jain, S.P.Jain and K.L. Narang – Advanced Accountancy – Kalyani publishers – New Delhi - 110002.
3. Arulanandam and Raman – Advanced Accountancy – “Himalaya Publishing house” – Mumbai -400004.

**6. Teaching Learning methods:**

PPT, Lecture, Test, Assignment

### 7. Course outcome:

After Completion of the Course Tally the students will be able to

CO No.	Statement	Level
CO 1	Familiarise the students with the accounting concepts and the purpose of double entry system to understanding the accounting system properly.	K1 & K2
CO 2	Understand the Journal, Ledger , Subsidiary books and Trial Balance	K2
CO 3	Interpret the problems of final accounts of a sole trader and acquire knowledge to rectification of errors.	K3
CO 4	Familiarise the basic knowledge on creation of company in Tally software	K3
CO 5	Develop a Strong knowledge on ledger ,Group creation and Voucher creation	K2

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	2	3	3	2	3	3	3	1		2	31
CO2	3	3	3	2	2	3	2	2	2	1	-	2	2	27
CO3	3	3	3	3	3	3	3	3	2	2	2	2	1	33
CO4	3	3	3	2	2	3	2	3		2	2	3	-	28
CO5	3	3	2	2	2	3	2	2	2	1	3	2	1	28
<b>Grand Total of COs with PSOs and POs</b>														<b>147</b>
<b>Mean Value of COs with PSOs and POs(147/61)</b>														<b>2.40</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.40
Observation	COs of Tally strongly related with PSOs and POs		

Semester : EVEN

Hours : 30

Sub. Code : 23VCOE1

Course : Value Added-----

**1. Title of the Paper : INVESTMENT MANAGEMENT****2. Course Objectives (CO)**

1. Understand the meaning of the term investment and the unique features of investment programme.
2. To enumerate various financial assets.
3. To get wide knowledge about primary market
4. To enhance the knowledge about SEBI and its functions
5. To describe and calculate risk and expected return of various investment securities

**3. Five units of the Syllabus:**

Unit	Content	Hours
1.	<b>Investment:</b> Meaning – Characteristics – Importance – Objectives – Factors of Sound Investment – Investment Environment – Investment Media – Principles of Investment – Speculation – Gambling – Investment Process (Theory).	6
2.	<b>Financial Assets:</b> Meaning – Classification – Shares – Debentures – Bonds – Innovative Financial Assets- Properties of Financial Assets (Theory).	6
3.	<b>Primary Market:</b> Meaning – Growth and Development – Role of NIM – Methods of Issues – Parties Involved – Allotment Process – Investor Protection – Recent Trends (Theory)	6
4.	<b>Secondary Market:</b> Meaning – History – Functions – Regulatory Framework – Listing and Delisting of Securities – Trading Procedure – Stock Exchanges in India – Growth of Stock Exchanges in India – SEBI – Its Functions and Role (Theory).	6
5.	<b>Risk: Meaning – Sources of Risk – Market Risk – Interest Risk – Interest Rate Risk –</b> Purchasing Power Risk – Business Risk – Financial Risk – Types of Risk – Systematic Risk – Unsystematic Risk <b>Return:</b> Meaning – Holding Period Return – Equivalent Annual Return – Expected Value of Return	6

**4. Text book:**

Preethi Singh, 2009, Investment Management, Himalaya Publishing House, Mumbai.

**5. Reference:**

1. Punithavathy Pandian, 2004, Security Analysis and Portfolio Management, Vikas Publishing House Private Ltd.

2. Bhalla, V.K: Investment Management. S. Chand & Co. Fischer, Donald, E. and Ronald, J.Jordan: Security Analysis & Portfolio Management,

### 6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion.

### 7. Course Outcome (CO):

After Completion of the Course Investment Management the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the meaning of the term investment and the unique features of investment programme	K2
CO 2	Gain a comprehensive knowledge on financial institutions and markets in India and the structure of financial system	K1
CO 3	Develop a perfect understanding on the securities exchange board of India	K3
CO 4	Understand the knowledge of Financial markets	K4
CO 5	Identify the risks involved in different alternatives and enable them to analyse the return they get out of their portfolio	K1

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	2	2	3	3	2	3	2	1			27
CO2	3	3	3	3	2	3	2	2	2		-	2	2	27
CO3	3	3	2	2	3	3	3	3			2	2	1	27
CO4	3	3	3	3	3	3	2	1	2	1	2	-	-	26
CO5	3	3	1	3	2	3	3	2	1	2	1		1	25
<b>Grand Total of COs with PSOs and POs</b>														<b>132</b>
<b>Mean Value of COs with PSOs and POs(132/56)</b>														<b>2.35</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.35
Observation	COs of Investment Management strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

Semester : EVEN  
Sub. Code : 23VCOE1

Hours : 30  
Course : Value Added

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**1. Title of the Paper : DIGITAL MARKETING**

**2. Course Objectives (CO)**

1. To enrich the students' knowledge in Digital marketing
2. To impart knowledge in website planning and development.
3. To enlighten the concept of Search Engine Optimisation.
4. To create in-depth knowledge about E – Mail marketing.
5. To demonstrate an awareness on social marketing.

**3. Five units of the Syllabus:**

Unit	Content	Hours
1.	<b>Digital Marketing:</b> Introduction – Definition – Significance – Traditional Marketing Vs Digital Marketing – Digital marketing process	6
2.	<b>Website planning and Development:</b> Types of Websites – Keyword – Types of Keywords - Understanding Domain and webhosting – Building website/ Blog using CMS Wordpress	6
3.	<b>Search Engine Optimisation:</b> – Key word planner tools – on page SEO Techniques – Indexing and key word placement – Content optimization – Off page SEO Techniques.	6
4.	<b>E mail Marketing:</b> Introduction – Significance – Designing e – mail marketing campaigns – Building e-mail List and sign up forms - E- mail marketing strategy and monitoring – E –mail Automization.	6
5.	<b>Social Media Marketing:</b> Introduction – Significance – Face book marketing : Introduction - Types of various Ad formats – Use of different social media platforms – Content creation	6

**4. Book for Study**

1. Self learning management series, Digital marketing, Vibrant Publishers, 2020

**Reference Books:**

1. Puneet Bhatia, Fundamentals of Digital marketing, Pearson, 2019.
2. Dr.Rithika Malik, Ms.Ritika Aggarwal, Digital marketing, Bluerose Publishers Pvt Ltd, 2021

### 5. Teaching Learning Methods:

Power Point Presentation, Quiz, Assignments, etc....

### 4. Course Outcome(CO):

After Completion of the Course Digital Marketing the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Understand digital marketing process.	K1
CO2	Gain knowledge in website planning and development.	K2
CO3	Explore the concept of Search Engine Optimisation.	K3
CO4	Gather in-depth knowledge about E – Mail marketing.	K3
CO5	Create Adformats by use of various social platforms.	K4

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	3	3	3	3	3	3	3	3	2	2	1	35
CO2	3	3	2	3	2	3	3	-	3	3	2	2	2	31
CO3	3	3	2	1	-	3	3	-	3	3	3	2	1	27
CO4	3	3	2	2	3	3	3	-	3	3	3	3	-	31
CO5	3	2	3	2	3	3	3	3	3	3	3	2	-	33
<b>Grand Total of COs with PSOs and POs</b>														<b>157</b>
<b>Mean Value of COs with PSOs and POs (157/59)</b>														<b>2.66</b>

Strong-3, Medium-2, Low-1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.66
Observation	COs of Digital Marketing strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

**Semester : EVEN**  
**Sub. Code : 23VCOE2**

**Hours : 30**  
**Course : Value Added**

1. **Title of the Paper : BRAND MANAGEMENT**

2. **Course Objectives (CO)**

1. To acquaint the students with concepts and techniques of brand management
2. To give experience in the application of concepts in the modern business world
3. To impart knowledge on the creation of relationships with customers.
4. To facilitate Brand Planning, Brand Positioning Models
5. To analyze brand positioning brand assessment through research

3. **Five units of the Syllabus:**

Unit	Content	Hours
<b>1.</b>	<b>BRANDING CONCEPTS:</b> Branding –meaning -Definitions of Brands, Characteristics of a Brand, Brands, and Products, Establishing a Brand, Benefits of a Strong Brand, The 3 Cs of Branding, Important factors about Branding	<b>6</b>
<b>2.</b>	<b>BRAND EVOLUTION AND VALUE OF BRANDS:</b> Understanding of Brand Evolution, Understanding of the Branding process, Value of Brands, The Importance of Brand Planning, Issues Influencing Brand Potential, Eight Dimensions of Brands	<b>6</b>
<b>3.</b>	<b>THE BRAND AND THE CONSUMER:</b> Introduction, Why should Businesses try to build their Brands? Why it is Important to Create Powerful Brands? The Nature of Relationships with Customers, The Organization's Marketing Assets, The Importance of a Brand, The Brand –Customer Relationship, The Consumer Mindset	<b>6</b>
<b>4.</b>	<b>BRAND PLANNING AND BUILDING:</b> The Concept of Customer-Based Brand Equity, Building Customer-Based Brand Equity, And Three Tools to Facilitate Brand Planning: Brand Positioning Model, Brand Resonance Model, and Brand Value Chain Model.	<b>6</b>
<b>5.</b>	<b>BRAND POSITIONING BRAND ASSESSMENT THROUGH RESEARCH:</b> Introduction, Brand Positioning Defined, Market Segmentation and Positioning, Developing a Positioning Strategy, Brand Positioning Strategies and How it Works, Brand Identity, Position, Image, Personality, Assessment and Change.	<b>6</b>

#### 4. Book for Study

1. S Ramesh Kumar: Marketing and branding. Pearson publishers

#### 5. Reference Books:

1. Pati D Branding Concepts and Process Publisher Macmillan
2. Subroto Sen Gupta Brand Positioning Tata McGraw –Hill
3. S Ramesh Kumar: Marketing and branding. Pearson publishers

#### 6. Teaching Learning Methods:

Power Point Presentation, Quiz, Assignments, etc....

#### 7. Course Outcome(CO):

After Completion of the Course Brand Management the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Understand the brand management concepts	K1
CO2	Gain knowledge of brand values.	K2
CO3	Explore the customer relationship and importance of brand	K3
CO4	Gather in-depth knowledge about brand planning and building.	K3
CO5	Gain knowledge in brand Positioning, brand Assessment through Research.	K4

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	3	3	3	3	3	3	3	2	2	1	35
CO2	3	3	2	3	2	3	3	-	3	3	2	2	2	31
CO3	3	3	2	1	-	3	3	-	3	3	3	2	1	27
CO4	3	3	2	2	3	3	3	-	3	3	3	3	-	31
CO5	3	2	3	2	3	3	3	3	3	3	3	2	-	33
<b>Grand Total of COs with PSOs and POs</b>														<b>157</b>
<b>Mean Value of COs with PSOs and POs (157/59)</b>														<b>2.66</b>

Strong-3, Medium-2, Low-1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.66
Observation	COs of Brand Management strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

**Semester : EVEN**  
**Sub. Code : 23VCOE3**

**Hours : 30**

**1. Title of the paper :** Modern Banking

**2. Course Objectives (CO)**

1. To Identify the relationship between banker and customer.
2. To Know opening and operating bank accounts.
3. To familiarize the various types of cheques.
4. To interpret and examine loans and advances.
5. To enhance practical knowledge in E- banking services..

**3. Five units of the Syllabus:**

UNITS	CONTENT	HOURS
<b>I</b>	Bank – Banker - Banking: Meaning – definition – Scope – Bank vs Banking- Types of banks in India – functions: Commercial banks and Reserve Bank of India -Relationship of banker and Customer – General relationship, Special relationship.	<b>6</b>
<b>II</b>	Opening and Operations of bank accounts - Types of Accounts Types of Customer / Account holders.	<b>6</b>
<b>III</b>	Cheque: Definition of Cheque - Essentials of a Cheque-Drawing of a cheque – Types of cheques – material alteration - Crossing	<b>6</b>
<b>IV</b>	Loans and advances: principles of lending-Types of Lending - Overdrafts, cash credit, Demand Draft, Lending against life policies-Documents to title to goods-Lien, pledge, Hypothecation, Mortgage and assignment.	<b>6</b>
<b>V</b>	E – Banking : Meaning – Debit card – Credit card – ATM -Internet Banking - Electronic Fund Transfer (EFT) – RBI Guidelines – Benefits of electronic clearing system – E – Cheques – E – money – Real Time Gross Settlement (RTGS) -Core Banking Solutions (CBS) - Benefits	<b>6</b>

**4. Book for Study**

- 1.Gordon E. and Natarajan.(K.2015), "Banking Theory Law and Practice", Himalaya Publishing House,Mumbai.

**Reference Books:**

- 1.Varshney P. N, Banking Law and Practice, S.Chand& Sons, New Delhi, 2018.
- 2.Sundharam K.P.M, Varshney P.N, Banking Theory, Law and Practice, S.Chand& Sons, New Delhi, 2017.
- 3.Srivastava P.K, Banking Theory, Law and Practice, Himalaya publishing House, New Delhi, 2016.

**6. Teaching Learning Method**

PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion

## 7. Course Outcome (CO)

After Completion of the Course Modern Banking the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the relationship of banker with the customer	K2
CO 2	Know the procedural formalities in dealing with different kinds of accounts / deposits.	K1
CO 3	Develop a practical knowledge on using different kinds of cheque.	K3
CO 4	Acquire the knowledge on loans and advances.	K3,K4
CO 5	Learn E – Banking techniques.	K4

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	2	2	3	3	3	3	2	2	-	3	2	2	-	27
CO2	2	3	3	3	2	3	3	1	2	3	-	-	1	26
CO3	3	3	2	2	3	3	3	2	2	3	2	1	-	29
CO4	3	2	3	-	1	3	3	3	2	2	3	-	2	27
CO5	3	3	3	2	2	3	3	-	3	2	1	2	1	28
<b>Grand Total of COs with PSOs and POs</b>														<b>137</b>
<b>Mean Value of COs with PSOs and POs(137/58)</b>														<b>2.36</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and Pos			2.36
Observation	COs of Modern Banking strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

**Semester : EVEN**  
**Sub. Code : 23VCOE1**

**Hours : 30**

**1. Title of the Paper: PRINCIPLES OF INSURANCE**

**2. Course objectives:**

1. To understand the concept and importance of insurance.
2. To identify annuities, term insurance and comprise the basic methods of premium in life insurance.
3. To impart knowledge on general insurance.

**3. Three Units of Syllabus:**

UNITS	CONTENT	HOURS
I	<b>Insurance:</b> Definition of insurance - Characteristics of insurance – Principles of contract -Importance of Insurance	<b>10</b>
II	Life Insurance Business - Fundamental principles of life insurance – Basic insurance – Insurance intermediaries of insurance – General Concepts of Insurance – Types of life insurance policies	<b>10</b>
III	General Insurance Business - Fundamental principles of general insurance – Claims settlement and females – Policies for handicapped lives – Pension plans – Health insurance – variants – Endowment insurance and its variants – Annuities – Policies for children.	<b>10</b>

**4. Book for Study:**

1. Insurance Theory and Practice , Nalini Prava Tripathy &Prabir Pal, House

**5. Books for Reference:**

1. M. Y. Khan, *Indian Financial System*, Tata McGraw-Hill.
2. S. Balachandran, Karve, Palav, *Life Insurance*, Insurance Institute of India.
3. S. Balachandran, *General Insurance*, Insurance Institute of India. Education.
4. George Rejda, *Principles of Risk Management and Insurance*, Pearson

**6. Teaching Learning Methods:**

Power Point Presentation, Group Discussion, Brain Storming, Quiz, Students Staging Presentation, Assignments, etc....

**7. Course Outcome (CO):**

After Completion of the Course Principles of Insurance the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the basic knowledge on fundamentals of Insurance.	K2
CO 2	Developing a Strong knowledge on different types of insurance policies.	K1
CO 3	Gain knowledge on different general insurance policies.	K2&K3

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	2	3	3	3	3	3	1	1	1	1	30
CO2	3	2	3	2	3	3	3	3	2	2	2	3	2	33
CO3	3	2	3	3	2	3	3	3	2	3	2	3	2	34
<b>Grand Total of COs with PSOs and POs</b>														<b>97</b>
<b>Mean Value of COs with PSOs and POs(97/39)</b>														<b>2.488</b>

**Strong -3, Medium -2, Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.66
Observation	COs of Principles of Insurance strongly related with PSOs and POs		



**DEPARTMENT OF COMMERCE**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**PG DEPARTMENT OF COMMERCE- B.Com. (General)**  
**CBCS Pattern (From 2022-2023) onwards**

<b>I SEMESTER</b>				
<b>PART</b>	<b>SUBJECT CODE</b>	<b>PAPER</b>	<b>Hrs</b>	<b>Cr</b>
I	22UTML11/ 22UHNL11/ 22UFNL11	Tamil/Hindi/French	06	04
II	22UENG11	English through Prose & Short Story	05	04
III		Core		
	22UCOC11	Advanced Accountancy-I	06	05
	22UCOC21	Principles of Insurance	06	05
	22UCOA11	Allied –I Fundamentals of Economics	05	04
IV	22UFCE11	FC – Personality Development	01	01
	22UCSH12	Communication Skills	01	
	22UBRC11	Bridge Course	-	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC / NSS /Phy. Edn. / YRC ROTARACT /AICUF/ NCB	---	---
		Total	30	24
<b>II SEMESTER</b>				
I	22UTML22/ 22UHNL22/ 22UFNL22	Tamil/Hindi/French	06	04
II	22UENG22	English through Prose & Poetry	05	04
III		Core		
	22UCOC32	Advanced Accountancy-II	06	05
	22UCOC42	Fundamentals of Computer– Theory	04	02
	22UCOP12	Practical	02	02
	22UCOA22	Allied – II Introduction to Marketing	05	04
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	01	01
	22UCSH12	Communication Skills	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC / NSS /Phy. Edn. / YRC ROTARACT /AICUF/ NCB	--	01
		Total	30	24
<b>III SEMESTER</b>				
III		Core		
	22UCOC53	Partnership Accounts	06	05
	22UCOC63	Working Capital Management	06	04
	22UCOC73	Banking Theory, Law and Practices	06	04
	22UCOA33	Allied – III Business Mathematics	05	04

IV	22UCON13	Basic Tamil/Advanced Tamil Non Major Elective to Science Students - Retail Marketing	03	02
	22UCOS13	SBE – I Business Communication	03	02
	22UFCE33	FC – Environmental Studies	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NCC / NSS /Phy. Edn. / YRC ROTARACT /AICUF/ NCB	---	---
	22UARE14	ARISE	----	---
		Total	30	22
<b>IV SEMESTER</b>				
III		Core		
	22UCOC84	Corporate Accounting - I	06	05
	22UCOC94	E-Commerce	06	04
	22UCOD04	Business Management	06	04
	22UCOA44	Allied IV - Business Statistics	05	04
IV	22UCON24	Non Major Elective to Arts Students – 2.E – Tailing	03	02
	22UCOS24	SBE - II Entrepreneurship Development	03	02
	22UFCH44	FC – Religious Literacy and Peace Ethics	01	01
V	22UNCC/NSS/ PED/YRC/ROT/AC F/NCB24	Extension Activities NCC / NSS /Phy. Edn. / YRC ROTARACT /AICUF/ NCB	---	01
	22UARE14	ARISE	---	01
		Total	30	24
<b>V SEMESTER</b>				
III		Core		
	22UCOD15	Cost Accounting	05	05
	22UCOD25	Income Tax -I	05	04
	22UCOD35	Auditing	05	04
	22UCOD45	International Business	05	04
	22UCOD55	Corporate Accounting II	05	04
	22UCOE15	Core Elective I – Indian Financial System Investment management Portfolio Management	03	03
IV	22UINT15	Internship (Holidays)	-	01
	22USSI16	Soft Skills	02	--
		Total	30	25
<b>VI SEMESTER</b>				
III		Core		
	22UCOD66	Accounting Software in Business - Theory	02	03
	22UCOP26	Practical	04	02
	22UCOD76	Income Tax II	05	04
	22UCOD86	Accounting for Managers	05	04
	22UCOD96	Commercial Law	05	04

	22UCOT06	Institutional Training	04	03
	22UCOE26	Core Elective- II - Human Resource Management Advertising and Salesmanship Services Marketing	03	03
IV	22USSI16	Soft Skills	02	02
		Total	30	25

Semester	I	II	III	IV	V	VI	Total
Credits	24	24	22	24	25	25	144

**Self Learning Courses - Additional Credits**

Semester	Credits
III	3
IV	3
V	3
VI	3

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

**Class : III B.Com**  
**Semester : V**  
**Subject Code : 22UCOD15**

**Part : Core 11**  
**Hours : 75**  
**Credits : 05**

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**1. Title of the Paper: Cost Accounting**

**2. Course Objectives (CO)**

1. To familiarize the various elements of cost and construct a cost sheet
2. To outline the procedure for purchase of material, maintaining level of stock and material cost control.
3. To Compute earnings of workers under different methods.
4. To Calculation of apportionment and allocation of overheads.
5. To Analyze costing techniques for contract work and process costing.

**3. Five units of Syllabus**

<b>UNITS</b>	<b>CONTENT</b>	<b>HOURS</b>
<b>I</b>	Costing: Definition – Importance of Costing – Objectives and advantages – Differences between cost accounting and financial accounting – Analysis and classification of costs – Preparation of cost sheet.	<b>15</b>
<b>II</b>	Materials: Purchase procedure – Requisition of material - Control – Recording and controlling of material department – Maintenance of stores – Minimum Level, Maximum Level, Re-order Level, Economic Order Quantity – Methods of pricing the issue of materials – FIFO and LIFO, Simple average and weighted average method	<b>15</b>
<b>III</b>	Labour: Methods of remunerating labour – Incentive schemes – Halsey Premium Plan, Rowan system, Emersion efficiency Bonus and Beaux Point Premium – Idle time – Control over Idle time — measurement of Labour Turn over.	<b>15</b>
<b>IV</b>	Accounting of Overheads: Classification – Fixed and Variable Overheads – Basis of charging overheads – Allocation – Works overhead, Administration overheads, Selling and distribution overheads – Appropriation and absorption.	<b>15</b>
<b>V</b>	Contract Costing: Profit on incomplete contracts – Simple problems only (excluding estimated contracts) Process costing: Normal loss, abnormal loss and Abnormal gain. (Simple problems only.)	<b>15</b>

**4. Text Book:**

Jain.S.P. and K.L.Narang, 2007, “Cost Accounting”, Kalyani Publications, New Delhi.

**5. Reference Books:**

3. Shukla.M.C ,& T.S. Grewal, 2000, “Cost Accounting”, S.Chand& Company Ltd., New Delhi.
4. Alex, K. 2007,’ Cost Accounting’, ARR Publications, Trichy – 2.

**6. Teaching Learning Method:**

PPT, Seminar, Quiz programme, Assignment, Chalk and talk,

### 7. Course Outcome (CO):

After Completion of the Course Cost Accounting the students will be able to

Sl. No.	Course Outcome	Knowledge Level
CO1	Describe how cost accounting is used for decision making and performance evaluation and to construct cost sheet	K2
CO2	Develop the procedure involved in purchase of material, maintaining level of stock and material cost control	K2
CO3	Apply the concept and techniques for calculating earnings of workers under different methods	K3
CO4	Demonstrate working knowledge in allocation and apportionment of overheads	K3
CO5	Analyse the problems of process and contract costing	K4

**K1 – Remember, K2 – Understand, K3-Apply, K4- Analyze, K5-Evaluate K6-Create**

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	1		3	3	3		1	1	1		22
CO2	3	3	3	2	3	3	3	2	3	2	2	1	2	32
CO3	3	3	2	3	2	3	3	2	3	3	2	1	1	31
CO4	3	3	2	3	2	3	3	3	2	3	3	2	1	33
CO5	3	3	1	1		3	3	1	1		3	3	2	24
<b>Grand Total of COs with PSOs and POs</b>														<b>142</b>
<b>Mean Value of COs with PSOs and POs(/60)</b>														<b>2.36</b>

**Strong -3, Medium -2, Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.36
Observation	COs of Cost Accounting strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

Class : III B.Com	Part : Core12
Semester : V	Hours : 75
Subject Code : 22UCOD25	Credits : 04

**1. Title of the Paper: Income tax - I**

**2. Course Objectives (CO):**

1. To understand the definitions, basic concepts and classification of different heads.
2. To Identify the different forms of salary and deduction u/s 16.
3. To evaluate the business or profession and undervaluation or overvaluation of stock.
4. To comprehend the house property and capital gains.
5. To Acquaint with the income from other source and TDS.

**3. Five Units of Syllabus**

UNITS	CONTENT	HOURS
<b>I</b>	The Income Tax Act -Definition of Income -Assessment Year -Previous Year -Assessee –Types of Assessee -Scope of Income -Charge of Tax - Residential Status –Exempted Incomes U/S 10.	<b>15</b>
<b>II</b>	Computation of Income from salaries –Different forms of salary– allowances, perquisites and their types and treatment –Profits in lieu of salary and exempted profits –Deductions U/S 16.	<b>15</b>
<b>III</b>	Income from Business or Profession -Meaning of Business or Profession -Computation of Profits and Gains of Business or Profession of an Individual-Expenses Expressly Allowed -Expenses Expressly Disallowed- Treatment of under-valuation and over-valuation of stock.	<b>15</b>
<b>IV</b>	Income from House property –Determination of Annual value – Deductions out of annual value Income from Capital Gains - Computation of Capital Gains-capital gains exempted u/s 10- Deductions / Exemptions available u/s 54 while calculating capital gains.	<b>15</b>
<b>V</b>	Income from Other Sources -Computation of Income from Other Sources- various kinds of securities – Winning from lotteries, puzzles, card games – Tax treatment- TDS.	<b>15</b>

**4. Text Book:**

Dr.Srinivasan, Income Tax Law and Practice, Himalaya Publishing House, Mumbai. Latest edition.

**5. Reference Books:**

1. Dr.R.G.Saha, Dr.UshaDevi.N, Current edition,“ Income Tax”, Himalaya Publishing House, Mumbai.
- 2.Vinod Singhanian&, Kapilsinghanian, Monica Singhanian, Current edition, “Direct taxes”, Kalyani Publishers, New Delhi.

**6. Teaching Learning Methods**

Power Point Presentation, Group Discussion, Assignment, chalk and talk method

## 7. Course Outcome (CO):

After Completion of the Course Income Tax - I the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	understand the basic concepts of income tax	K1
CO 2	Identify the forms of salaries.	K2
CO 3	assess the students on understanding concepts	K3
CO 4	Compute the house property and capital gains.	K4
CO 5	differentiate the other sources of income	K5

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	2	3	3	3	3	3	3	1	3	3	3	1	-	31
CO2	2	3	3	3	3	3	2	1	3	3	2	-	2	30
CO3	2	3	-	2	-	3	3	1	3	3	1	2	2	25
CO4	3	3	-	3	2	3	3	3	3	3	3	1	-	30
CO5	3	3	2	1	-	-	3	3	3	2	2	3	-	25
<b>Grand Total of COs with PSOs and POs</b>														<b>141</b>
<b>Mean Value of COs with PSOs and POs(141/56)</b>														<b>2.51</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.51
Observation	COs of Income Tax - I strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

<b>Class</b> : B.Com	<b>Part</b> : Core-13
<b>Semester</b> : V	<b>Hours</b> : 75
<b>Subject Code</b> : 22UCOD35	<b>Credits</b> : 04

**AUDITING**

**1. Title of the Paper: Auditing**

**2. Course Objectives (CO):**

To make the students

1. To Gain knowledge about fundamentals of Auditing
2. To understand the audit of companies internal check and the procedure for internal check
3. To Develop Critical thinking through Vouching.
4. To Analyze the Verification and valuation of assets and liabilities.
5. To familiarize the liabilities of an auditor.

**3. Five units of the Syllabus:**

UNITS	CONTENT	HOURS
<b>I</b>	Auditing - Definition-Objectives-, Auditing & Investigation-Advantages of Audit-Qualities of an auditor- Various types of Audit- Conduct of Audit: Procedure of Audit, Audit Programme-Audit notes, Audit files-Working papers – E-Auditing.	<b>15</b>
<b>II</b>	Internal Control: Internal Check –Meaning –Definitions- objectives –procedure of internal check – Advantages – Duties of an auditor in connection with internal check	<b>15</b>
<b>III</b>	Vouching: Meaning- Definitions- Importance – Duties of an auditor –Vouching receipts - cash sales- Receipts from debtors- Other receipts- Vouching payments- –Wages- Capital expenditure- Other payments and expenditure of petty cash payments- Vouching of banks- transactions-Vouching of cash - Returnable containers – Sales Return - Sales Ledger.	<b>15</b>
<b>IV</b>	Valuation and Verification of Assets & Liabilities - Fixed assets-Wasting Assets- Investments-Inventories, Freehold and Lease hold property- Loans and advances- Bills receivables – Sundry Debtors- Plant and machinery – patents and copy rights.	<b>15</b>
<b>V</b>	Liabilities of an Auditor: Liability for negligence- Liability for Misfeasance- Criminal liability- Liability to third parties.	<b>15</b>

**4. Books for Study:**

1. Tandon, B.N, 2007, "Auditing", S. Chand & Son Company, New Delhi.

**5. Books for Reference:**

1. Kamal Gupta, 2006, "Fundamentals of Auditing", Tata McGraw Hill, New Delhi.
2. Premavathy, 2006, 'Practical Auditing', Sri Vishnu Publications., Chennai.

## 6. Teaching Learning Methods:

Power Point Presentation, Group Discussion, Brain Storming, Quiz, Students Staging Presentation, Assignments, etc....

## 7. Course Outcome (CO):

After Completion of the Course Auditing the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the basic knowledge on fundamentals of Auditing.	K2
CO 2	Developing a Strong knowledge on internal check and internal audit	K1
CO 3	Utilizing and understanding, how to verify the vouchers with documents	K2&K3
CO 4	Familiarize the verification and valuation of assets and liabilities	K4
CO 5	Gain knowledge on different liabilities of an auditor	K2

K1=Knowledge      K2=Understanding      K3=Application      K4=Analysis  
K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO	PSO	PSO	PSO	PSO	PO	Sum of COs with PSOs and POs							
	1	2	3	4	5	1	2	3	4	5	6	7	8	
CO1	3	3	3	2	3	3	3	3	3	1	1			28
CO2	3	2	3	2	3	3	3	3	2		2	3	2	31
CO3	3	2	3	3	2	3	3	3	2	3	2	3	2	34
CO4	3	3	3	3	3	3	3	3				3	3	30
CO5	3	3	3	2	1	3	3	2	2	3	3	3	3	34
<b>Grand Total of COs with PSOs and POs</b>														<b>157</b>
<b>Mean Value of COs with PSOs and POs(157/59)</b>														<b>2.66</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.66
Observation	COs of Auditing strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**  
**DEPARTMENT OF COMMERCE**

**Class : III BCOM**  
**Semester : V**  
**Subject Code : 22UCOD45**

**Part : Core- 14**  
**Hours : 75**  
**Credit : 4**

**1. Title of the paper: International Business**

**2. Course Objectives (CO):**

- 6) To impart the knowledge and skills of analysis on operational processes of business between two or more nations.
- 7) To understand the application of International Business Environment and illustrating the concepts of World Trade Organization.
- 8) To Aware of critical thinking on foreign trade policy and viewpoints of diverse cultures.
- 9) To evaluate the concept of global business environment and its impact on business.
- 10) To learn Import and Export procedure and formalities in Exchange Control.

**3. Five Units of Syllabus:**

<b>UNITS</b>	<b>CONTENT</b>	<b>HOURS</b>
<b>UNIT-1</b>	International Business: Meaning, Nature and Importance. Types of International Business, International Business Approaches: Classical, Neo-Classical Approach, Modern Approach. Introduction to theory of Absolute Differences in Costs by Adam Smith, Ricardian Theory of Comparative Costs.	<b>15</b>
<b>UNIT-2</b>	International Business Environment: Globalization - Forces, Meaning, Dimensions and Stages in Globalization –Modes of entry – De globalization. GATT, WTO – Objectives and Functions of WTO. Modes of entry – De globalization. GATT, WTO – Objectives and Functions of WTO.	<b>15</b>
<b>UNIT-3</b>	<b>Foreign Trade and Policy and Regulation:</b> Foreign Trade Policy – Objectives, Strategies, Features and promotional measures. Balance of Payment- Meaning, Components of Balance of Payment- Disequilibrium in the Balance of Payment – methods of correction of disequilibrium.	<b>15</b>
<b>UNIT-4</b>	Export Finance: Institutional Finance for export – Pre shipment credit – Post shipment credit- EXIM bank – ECGC – Quality control and pre shipment Inspection – FERA – FEMA - IMF – IFC – UNCTAD – UNIDO.	<b>15</b>
<b>UNIT-5</b>	Export procedures and Documentation – procedures and formalities in the export of goods – Exchange control formalities – shipping of goods – Export documents – Documents related to goods – Certificates related to shipment – Documents related to payment – Documents related to inspection – Documents related to Excisable goods – Documents related to Foreign Exchange Regulation	<b>15</b>

#### 4. Text Book:

2. Sabah Rao, International Business, Himalaya Publishing House 2010, Mumbai. (Unit I,II & III)
3. Justin Paul, International Business, PHI Learning Private Limited 2011, New Delhi 110001. (Unit IV & V)

#### 5. Reference Books:

5. S.Sankaran, International Business, Himalaya Publishing House, 2010, Mumbai.
6. KhushpatS.Jain, Export Import Procedures & Documentation, Himalaya Publishing House 2011, Mumbai.

#### 6. Teaching Learning Methods:

Power point presentation, Seminars, Quiz Programme, Assignment, Test, Chalk and Talk method, Student staging presentation.

#### 7. Course Outcomes (CO):

After Completion of the Course International Business the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Explain the concept in international business with respect to foreign trade/ international business	K2
CO 2	Apply the currents business phenomenon and to evaluate the global business environment in terms of economic, social and legal aspects	K3
CO 3	Evaluate the impact of strategies and regulatory compliance on an organizations integrative trade business. Analyses the principle of international business and strategies adopted by firms to expand globally	K4
CO 4	Identify and interpret relevant international financial documents, and evaluate financial strategies that support an organizations integrative trade initiatives	K4
CO 5	Manage the preparation of documents and the application of procedures to support the movement of products and services in the organizations global supply chain	K5

K1=Knowledge K2=Understanding 3=Application K4=Analysis K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PS O 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	2	3	3	3	3	3	3	1	1		3	31
CO2	3	3	2	3	2	3	3	3	3	2	3	2	2	34
CO3	3	3	3	2	1	3	3	2	2	2	1	2	1	28
CO4	3	3	3	3	2	3	3	3	2	3	2	3	1	34
CO5	3	3	3	2		3	3		2	1		1		19
<b>Grand Total of COs with PSOs and POs</b>														<b>146</b>
<b>Mean Value of COs with PSOs and POs(146/60)</b>														<b>2.43</b>

**Strong -3, Medium -2, Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.43
Observation	COs of International Business strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625514**  
**DEPARTMENT OF COMMERCE**

**Class : III B. Com**  
**Semester : V**  
**Subject Code : 22UCOD55**

**Part : Core 15**  
**Hours : 75**  
**Credits : 04**

**1. Title of the paper: CORPORATE ACCOUNTING - II**

**2. Course Objectives:**

- To train the students in concepts of Amalgamation and External Reconstruction of companies.
- To enlighten the students on Holding Companies and
- To impart the knowledge on Banking Companies.
- To understand the recording of Final Accounts in the Insurance Companies.
- To Interpret the problems of inflation Accounting

**3. Five Units of syllabus:**

UNIT	CONTENT	HOURS
I	<b>Holding Companies</b> Meaning and Definition of Holding Company and Subsidiary Company – Preparation of Consolidated Balance Sheet – Consolidated Profit and Loss Accounts.	15
II	<b>Amalgamation &amp; Absorption</b> Meaning – External Reconstruction – Types of Amalgamation – Computation of Purchase Consideration – Methods of Accounting for Amalgamation – Pooling of Interests Method – Purchase Method.	15
III	<b>Bank Accounts</b> Business of Banking Companies – Preparation of Profit and Loss Account – Balance Sheet (Guidelines of RBI) -Items Requiring Special Attention in Preparation of Final Accounts.	15
IV	<b>Insurance Company Accounts</b> Insurance Accounts- Types –Revenue Account Preparation of Final Accounts of Insurance Companies - Final accounts of Life Insurance- Profit determination of Life Insurance	15
V	<b>Inflation Accounting</b> Inflation Accounting – Different methods of Inflation Accounting – Current Purchase Power Method – Current Cost Accounting Method – Hybrid Method.	15

**4. Book for Study**

3. Reddy.T.S & Murthy.A. (2014), "Corporate Accounting", Margham Publications, Chennai.

**5. Books for Reference:**

4. Hanif and Mukherjee. (2004), "Modern Accountancy", Tata McGraw Hill Publishing Company Ltd, New Delhi.
5. Shukla M.C., Grewal T.S (2004), "Advanced Accountancy", Sultan Chand & Company Ltd, New Delhi.

### 6. Teaching Learning methods:

PPT, Lecture, Test, Assignment

### 7. Course Outcome (CO):

After Completion of the Course Corporate Accounting II the students will be able to

CO No.	Statement	Level
CO 1	Familiarize the students with the Basic knowledge in Amalgamation & Absorption.	K1 & K2
CO 2	Classify and understand the Holding Companies.	K2
CO 3	Interpret the problems of final accounts of Banking Companies.	K3
CO 4	Understand the accounting of Insurance Companies.	K3
CO 5	Interpret the problems of inflation Accounting	K2

### 8. Mapping Course outcome with

(i) Programme Specific Objectives – PSO put tick mark in the correlating box)

(ii) Programme Objectives – PO (put tick mark in the correlating box)

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	3	3	-	3	3	2	3	2	-	1	1	27
CO2	3	3	3	3	2	3	2	2	1		2	-	-	24
CO3	3	3	3	-	3	3	3	-	2	2	-	2	-	24
CO4	3	2	3	3	-	3	2	2	-	2	2	-	2	24
CO5	3	3	3	2	3	3	2	2	3	2	-	-	2	28
Grand Total of COs with PSOs and POs														127
Mean Value of COs with PSOs and POs(127/52)														2.45

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.45
Observation	COs of Corporate Accounting - II strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

Class : III B. Com  
 Semester : V  
 Subject Code : 22UCOE15 (A)

Part : Core Elective - I  
 Hours : 45  
 Credit : 3

**1. Title of the Paper: INDIAN FINANCIAL SYSTEM**

**2. Course Objectives (CO):**

To facilitate the learners:

1. Understand the concept of Financial Assets, Financial intermediaries, Financial markets and Financial system and the share of financial system on the economic development.
2. Know about the features of Money Market and the recent developments in Indian Money Market.
3. Gain a comprehensive knowledge on the functions of New Issue Market and the Recent trends in the New issue market.
4. To build a strong understanding on the functions of securities exchange board of India, guidelines and the functions of credit rating.
5. To increase the awareness in the areas of stock exchange, brokers and their assistants –On line trading, speculative transactions and Stock indices.

**3. Five units of Syllabus:**

Unit	Content	Hours
<b>1.</b>	<b>Structure of the Financial System</b> – Functions of the financial system – Financial concepts, Financial Assets, Financial intermediaries – Financial markets – Money market – Capital Market – Foreign exchange Market – Financial Instruments : – Financial system and economic development – Financial system in India	<b>9</b>
<b>2.</b>	<b>Money Market</b> – Definition – Features of Money Market – Importance of Money Market – Composition of Money Market – Call Money Market – Commercial Bills, Treasury Bills Market- Commercial Paper – Money Market Instruments – Recent developments in Indian Money Market.	<b>9</b>
<b>3.</b>	<b>New Issue Market</b> – Functions of New Issue Market – Distinction between New Issue Market and Stock Exchange – Methods of floating new issue – Principal steps of a Public issue – Recent trends in the New issue market.	<b>9</b>
<b>4.</b>	<b>Securities and Exchange Board of India</b> –SEBI’s Guidelines - Depository – Distribution NSE,BSE,SENSEX – Mutual Funds& Merchant Banking – Credit Rating.	<b>9</b>
<b>5.</b>	<b>Secondary Market</b> – Functions of stock exchange – Organization of stock exchanges in India –Registration of stock brokers - Kinds of brokers and their assistants –On line trading, speculative transaction – Stock indices.	<b>9</b>

#### 4. Text Book:

E.Gordon and K.Natarajan "Financial Markets and Services" Eight Edition, Himalaya Publishing House, Mumbai, 2013.

#### 5. Reference Books:

- 1.P.N.Varshney&D.K.Mittal "Indian Financial System" Eleventh Edition, Sultan Chand & Sons, New Delhi, 2010.
- 2.E.Gordon&K.Natarajan "Financial Markets & Institution" Second Edition, Himalaya Publishing House, Mumbai, 2010.
- 3.H.R.Machiraju "Indian Financial System" Fourth Edition, Vikas Publishing House, Noida, 2010.

#### 6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion

#### 7. Course Outcome (CO):

After Completion of the Course Indian Financial System the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the concept of Financial Assets, Financial intermediaries, Financial markets and Financial system and the contribution of financial system towards the economic development	K2
CO 2	Know about the features of Money Market and the recent developments in Indian Money Market	K1
CO 3	Gain a comprehensive knowledge on the functions of New Issue Market and the Recent trends in the New issue market	K3
CO 4	To build a strong understanding on the functions of securities exchange board of India, guidelines and the functions of credit rating	K2
CO 5	To increase the awareness in the areas of stock exchange, brokers and their assistants –On line trading, speculative transactions and Stock indices	K4

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	3	2	1	3	3	3	3	2	1	2		29
CO2	2	3	2	2	3	3	3	2	3	2	3			28
CO3	3	3	3	2	2	3	3	2	2	2	3	2	2	32
CO4	2	3	2	2	2	3	3	2	2	3	2	2	1	29
CO5	3	3	2	2	3	3	3	2	2	2	3	2	1	31
<b>Grand Total of COs with PSOs and POs</b>														<b>149</b>
<b>Mean Value of COs with PSOs and POs(149/62)</b>														<b>2.40</b>

Strong -3, Medium -2, Low-1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean value of COs with PSOs and POs</b>			<b>2.40</b>
<b>Observation</b>	<b>COs of Indian Financial System strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

Class : III B. Com Part : Core Elective-I  
 Semester : V Hours : 45  
 Subject Code : 22UCOE15 (B) Credit : 3

**INVESTMENT MANAGEMENT**

**1. Title of the Paper : Investment Management**

**Course Objectives (CO):**

To facilitate the learners:

1. Understand the meaning of the term investment and the unique features of investment programme.
2. Gain a comprehensive knowledge on financial institutions and markets in India and the structure of financial system
3. Develop a perfect understanding on the securities exchange board of India.
4. Identify the risks involved in different alternatives and enable them to analyse the return they get out of their portfolio.
5. Get a wide knowledge on the importance of ideal portfolio

**3. Five units of Syllabus**

Unit	Content	Hours
1.	<b>Investment Management:</b> Meaning-Nature and scope of investments management – investments and speculation – Investment and Gambling – investment avenues– features of an investment programme – investment process and stages in investment.	9
2.	<b>Financial Institutions and Markets in India:</b> Development of the financial system in India – structure of financial markets , financial institutions — New developments in the financial system.	9
3.	<b>The Securities Exchange Board of India:</b> Kinds of Market-New issue market and stock exchange in India - Role of the new issue market – mechanics of floating new issues – Development in the stock market. Meaning – definition-Nature and scope. Objectives - functions organization of SEBI – SEBI’s Role in the primary market and secondary market	9
4.	<b>Return and Risk:</b> Return; Definition – measurement – traditional technique – statistical methods. Risk ; Definition – systematic risk – Unsystematic risk – quantitative analysis of risk.	9
5.	<b>Portfolio Investment:</b> Meaning- importance of ideal portfolio-Government securities – Life insurance – Private insurance companies –Commercial bank – post office scheme – Fixed deposit schemes in companies – New instruments – Mutual fund – Investment in real estate and Gold.	9

**4. Text book:**

Preethi Singh, 2009, Investment Management, Himalaya Publishing House, Mumbai.

**5. Reference:**

PunithavathyPandian, 2004, Security Analysis and Portfolio Management, Vikas Publishing House Private Ltd.

**6. Teaching Learning Method**

PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion.

**7. Course Outcome (CO):**

After Completion of the Course Investment Management the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the meaning of the term investment and the unique features of investment programme	K2
CO 2	Gain a comprehensive knowledge on financial institutions and markets in India and the structure of financial system	K1
CO 3	Develop a perfect understanding on the securities exchange board of India	K3
CO 4	Identify the risks involved in different alternatives and enable them to analyse the return they get out of their portfolio	K4
CO 5	Get a wide knowledge on the importance of ideal portfolio	K1

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

**Mapping of COs with PSOs and POs**

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	2	2	3	3	2	3	2	1			27
CO2	3	3	3	3	2	3	2	2	2		-	2	2	27
CO3	3	3	2	2	3	3	3	3			2	2	1	27
CO4	3	3	3	3	3	3	2	1	2	1	2	-	-	26
CO5	3	3	1	3	2	3	3	2	1	2	1		1	25
<b>Grand Total of COs with PSOs and POs</b>														<b>132</b>
<b>Mean Value of COs with PSOs and POs(132/56)</b>														<b>2.35</b>

**Strong -3, Medium -2, Low-1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	<b>0.01 to 1.0</b>	<b>1.01 to 2.0</b>	<b>2.01 to 3.0</b>
<b>Quality</b>	<b>Low</b>	<b>Medium</b>	<b>Strong</b>
<b>Mean value of COs with PSOs and POs</b>			<b>2.35</b>
<b>Observation</b>	<b>COs of Investment Management strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514

DEPARTMENT OF COMMERCE

CLASS : III BCOM

PART : Core Elective I

SEMESTER : V

HOURS: 45

SUBJECT CODE: 22UCOE15 (C)

CREDIT: 3

**1. Title of the paper: Portfolio Management**

**2. Course Objectives:**

1. To understand the meaning and concept of the term portfolio management.
4. To get a wide knowledge about risk and return.
5. To Gain a depth knowledge on portfolio analysis.
6. To develop a strong understanding on various types of analysis.
7. To grasp the portfolio selection and management.

**3. Five Units of syllabus:**

UNIT	CONTENT	HOURS
I	<b>Introduction</b> Portfolio -Meaning – Objectives -Terms Relating to Portfolio– Role of Portfolio Managers - Portfolio Management vs Wealth Management – Introduction to Derivatives -Futures Options -Swaps -SEBI Regulations Relating to Portfolio Operations	9
II	<b>Risk &amp; Return</b> Concepts of Risk, Return, Uncertainty Risk and Return Relationship Components of Return – Risk Elements – Systematic and Unsystematic Risks	9
III	<b>Portfolio Analysis</b> Planning- Selection –Evaluation-Revision-Variou-Steps involved in Portfolio Development Theories relating to Portfolio Analysis	9
IV	<b>Fundamental Analysis</b> Fundamental Analysis – Economic Analysis – Industry Analysis and Company Analysis, Technical Analysis; Dow Theory, Elliott Wave Theory , Charting , Efficient Market Hypothesis .	9
V	<b>PORTFOLIO SELECTION &amp; MANAGEMENT: AN OVERVIEW (Theory only)</b> Efficient Market Theory, Random Walk Theory, Portfolio Risk/Return, Traditional portfolio Selection, Capital Assets Pricing Model, Growth investing, Value investing.	9

**Book for Study**

1. Punithaathi Pandian – Security Analysis & Portfolio Management, Vikas Publishing House
2. Gurusamy S Security Analysis and Portfolio Management, Vijay Nicole Imprints
3. Francis Management of Investments

**5. Books for Reference:**

3. V.K. Bhalla – Investment Management S Chand & Co
4. Fisher & Jordan – Security Analysis & Portfolio Management

**6. Teaching Learning Method**

1. PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion.

## 7. Course Outcome (CO):

1. After Completion of the Course Portfolio Management the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the basic concepts in portfolio management.	K1
CO 2	Gain a comprehensive knowledge on risk and return of portfolio.	K2
CO 3	Plan and analyze the portfolio.	K3
CO 4	Identify the various analysis of portfolio	K4
CO 5	Get a wide knowledge on the selection of ideal portfolio	K3

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	3	2	2	3	3	2	3	2	1			27
CO2	3	3	3	3	2	3	2	2	2		-	2	2	27
CO3	3	3	2	2	3	3	3	3			2	2	1	27
CO4	3	3	3	3	3	3	2	1	2	1	2	-	-	26
CO5	3	3	1	3	2	3	3	2	1	2	1		1	25
<b>Grand Total of COs with PSOs and POs</b>														<b>132</b>
<b>Mean Value of COs with PSOs and POs(132/56)</b>														<b>2.35</b>

**Strong -3, Medium -2, Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.35
Observation	COs of Portfolio Management strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

**Class : III B. Com Part : S.L.C**  
**Semester : V Hours :**  
**Subject Code : 22UCOSL5 Credit : 3**

**1. Title of the Paper: Logistics Management**

**2. Course Objectives (CO):**

1. To explain the important Principles of Logistics Management
2. To study the activities involved in customer service
3. To understand the objectives of integrated logistics and its barriers
4. To know the role of information technology on logistics management
5. To find out the appropriate forecasting techniques

**3. Five units of the Syllabus:**

UNITS	CONTENT	HOURS
<b>I</b>	Logistics Management: Introduction- Objectives- Concept – Types of Logistics - Evolution of Logistics Management - Role of Logistics in an Economy- Difference between Logistics and Supply Chain Management- Logistics and Competitive Advantage- Logistics Mix- Logistics in Organized Retail in India – Problems Faced	
<b>II</b>	Logistics Activities: Functions- Objectives- Solution. Customer Service: Warehousing - Material Storage- Material Handling- Order Processing- Information Handling - Procurement Transportation - Packaging. Third party and Fourth Party Logistics: Reverse Logistics - Global Logistics.	
<b>III</b>	Integrated Logistics: Introduction- Objectives- Concept - Inventory Flow- Information Flow Operational Objectives of Integrated Logistics- Barriers to Integration- Organisation Structure Measurement System.	
<b>IV</b>	Inventory Ownership: Meaning – Role of Information Technology- Knowledge Transfer Capability Logistical Performance Cycle- Logistics Performance Cycle- Manufacturing Support Performance Cycle- Procurement Performance Cycle	
<b>V</b>	Demand Forecasting: Introduction- Objectives- Concept - Impact of Forecasts on Logistics Management- Forecasting Process- Forecasting Techniques- Selecting the Appropriate Forecasting Technique- Logistics Information Systems	

**Text Book**

1. Natarajan L, Logistics and Supply chain Management, Margham Publications, Chennai.2016

**References Books**

1. Bowersox Logistical Management, Mc-Graw Hill, Chennai 2017
2. Reguram G, Rangaraj N, Logistics and Supply Chain Management: Cases and Concepts, Macmillan India Ltd., New Delhi, 2017
3. Coyle, Bradi&Longby, the Management of Business Logistics, Third Edition, West Publishing Company, USA, 2016

## 6. Teaching Learning Methods:

Giving Guidance, provide study material

## 7. Course Outcome (CO):

After Completion of the Course Logistics Management the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Explain the various Principles of Logistics Management	K1
CO 2	Predict the logistics activities involved in customer service	K2
CO 3	Analyze the objectives of integrated logistics and its barriers	K3
CO 4	Relate the role of information technology on logistics management	K3
CO 5	Infer the appropriate forecasting techniques	K2

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	1	1	-	3	3	-	1	-	3	2	1	21
CO2	3	3	2	1	1	3	2	1	-	-	2	2	1	21
CO3	3	3	2	2	-	3	1	-	1	3	-	1	-	19
CO4	3	3	1	3	1	3	2	2	-	-		1	2	21
CO5	3	2	-	2	3	3	2	2	3	1			2	23
<b>Grand Total of COs with PSOs and POs</b>														<b>105</b>
<b>Mean Value of COs with PSOs and POs(105/50)</b>														<b>2.1</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs		2.00	2.1
Observation	COs of Logistics Management strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

Class : III B.Com	Part : III Core-16
Semester : VI	Hours : 30
Subject Code : 22UCOD66	Credits : 03

**1. Title of the Paper: Accounting Software in Business**

**2. Course Objectives (CO):**

1. To expose the students to Computer Applications in the field of Accounting.
2. To develop the skills of recording a financial transaction into the books of accounts.
3. To impart the knowledge regarding the creation inventory details.
4. To impart comprehensive knowledge on Tally with GST.
5. To develop practical skills to generate payroll slip.

**3. Five units of the Syllabus**

UNITS	CONTENT	HOURS
<b>I</b>	Introduction to Computerized Accounting – Computerized Accounting Vs. Manual Accounting – Merits of Computerized Accounting – Tally ERP9 – Features of Tally ERP 9 – Screen Components – Creation of Company – Selecting a Company – Altering/Modifying Company Creation Details – Deleting a Company – F11 Features – F 12 Configuration.	<b>6</b>
<b>II</b>	Accounts and Voucher — creation of groups (single and multiple groups) – creation of ledger (single and multiple) –display ledger accounts – Voucher types ; creation of voucher – voucher entry; configuration accounts vouchers – cost categories (single and multiple) Cost centres (single and multiple) - Generating Reports - Configuring reports - Balance Sheet - Profit and Loss Account - Trial Balance - Day books - Account Books - Statement of Accounts .	<b>6</b>
<b>III</b>	Inventory and Voucher; stock groups (single and multiple) – stock categories (single and multiple) – Stock items (single and multiple) – display, alter, deletion. God owns; creation of god owns (single and multiple) – unit of measures (single and compound) – display, alter, deletion. Inventory vouchers –common information - voucher types. Inventory Reports - Stock Summary - Inventory Books - Statement of Inventory.	<b>6</b>
<b>IV</b>	GST Taxes and Invoices - Understanding SGST,CGST and IGST , Setting up GST at Ledger level - vouchers - Default Vouchers - Creating a new Voucher type- Various voucher like Receipts, Payments, Journal etc. Inventory Details in vouchers - Setting up GST at Inventory level - Receipt note - Delivery note - Rejections.	<b>6</b>
<b>V</b>	Payroll: Enabling payroll - Creating Pay Heads - Single/Multiple Creation of Employee Groups - Single/Multiple Creation of employee head - Salary details - Configuration of salary details - Creating units of work - Managing and creating attendance/Production types - F 12 payroll configuration - payroll voucher -Generating a Sample Pay Slip.	<b>6</b>

#### 4. Books for Study:

Nandhni.A. K. Implementing Tally-9", COP Publications, New Delhi

#### 5. Books for Reference:

Tally Institute materials.

#### 6. Teaching Learning Methods:

Chalk &Board ,Power Point Presentation, Group Discussion, Brain Storming, Quiz, Students Staging Presentation, Assignments, etc....

#### 7. Course Outcome (CO):

After Completion of the Course **Accounting software in business** the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	understand the basic knowledge on creation of company in Tally software	K2
CO 2	Develop a Strong knowledge on ledger ,Group creation and Voucher creation	K1
CO 3	Develop to create the Inventory vouchers.	K2
CO 4	Familiarize the students on Tally with GST	K3
CO 5	Generation of Payroll Slip.	K4

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	2	3	3	2	3	3	3	1		2	31
CO2	3	3	3	2	2	3	2	2	2	1	-	2	2	27
CO3	3	3	3	3	3	3	3	3	2	2	2	2	1	33
CO4	3	3	3	2	2	3	2	3		2	2	3	-	28
CO5	3	3	2	2	2	3	2	2	2	1	3	2	1	28
Grand Total of COs with PSOs and POs														147
Mean Value of COs with PSOs and POs(147/61)														2.40

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.40
Observation	COs of Accounting software in business strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

Class : B.Com  
Semester : VI  
Subject Code : 22UCOP26

Part : Core Lab-2  
Hours : 60  
Credits: 02

**LAB CYCLE FOR ACCOUNTING SOFTWARE IN BUSINESS**

**Objective:**

**To Develop Comprehensive knowledge on Tally with GST**

1. Creation of Company
2. Creation of Account Group
3. Creation of Ledger Accounts
4. Creation of Cost categories
5. Creation of Cost centers
6. Creation of Voucher with GST
7. Voucher Transaction
8. Voucher Transaction displaying Book
9. Creation of Stock group and categories
10. Creation of stock items
11. Creation of God owns
12. Creation of units of measures
13. Maintaining accounts with inventory
14. Creation inventory vouchers With GST
15. Creation of Payroll
16. Reports

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

Class : III B.Com  
 Semester : V  
 Subject Code : 22UCOD76

Part : Core-17  
 Hours : 75  
 Credits : 04

**1. Title of the Paper: INCOME TAX II**

**2. Course Objectives (CO):**

1. To Understand the concept of set off and carry forward of losses, Deductions
2. To Identify the Return of Income, Procedures, Re assessment
3. To Evaluate the Collection of Tax at Source, Tax Refund
4. To Comprehend the Assessment of Partnership Firms, Association of persons and Joint stock Companies
5. To Acquaint with the powers and duties of Tax Authorities, Online Filing

**3. Five Units of Syllabus**

UNITS	CONTENT	HOURS
I	Clubbing of Income - Set off and carry forward of losses - Deductions from Gross Total Income	15
II	Return of Income - Submission of return Income - Return of Loss - Belated Return - Revised Return - Procedure for Assessment - Self Assessment - Reassessment - Best judgment Assessment - Ex-Party Assessment - Rectification of Mistakes - Reopening of Assessment.	15
III	Deduction and Collection of Tax at source - Advance payment - Tax Refunds - Consequences of failure to deduct or pay tax - Tax Credit Certificate - Tax Clearance Certificate	15
IV	Assessment of Partnership Firms, Association of persons and Joint stock Companies	15
V	Tax Authorities - Powers and duties - Procedure for Assessment - Types of Assessment - Penalties and offenses. Online filing and Return of income and TDS. Provisions and Procedures of Compulsory online filing of Returns for Specified Assessee.	15

**Text Book**

Dr.Hariharan.N, Income Tax Law and Practice, Dr.H.C. Mehrotra& D.S.P., Goyal, 62<sup>nd</sup> edition, SahityaBhawan Publications.

**5. Reference Books:**

1. Dr.R.G.Saha, Dr.UshaDevi.N, Current edition, "Income Tax", Himalaya Publishing House, Mumbai.
2. Vinod Singhania&, Kapilsinghania, Monica Singhania, Current edition, "Direct taxes", Kalyani Publishers, New Delhi.

**6. Teaching Learning Methods**

Power Point Presentation, Group Discussion, Assignment, chalk and talk method

### 7. Course Outcome (CO):

After Completion of the Course Income Tax II the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the concept of set off and carry forward of losses, Deductions.	K1
CO 2	Identify the Return of Income, Procedures, Re assessment	K2
CO 3	Assess the the Collection of Tax at Source.	K3
CO 4	Compute the the Assessment of Partnership Firms, Association of persons and Joint stock Companies	K4
CO 5	Evaluate the. with the powers and duties of Tax Authorities, Online Filling	K5

K1=Knowledge  
K5=Synthesis

K2=Understanding

K3=Application

K4=Analysis

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	2	3	3	3	3	3	3	1	3	3	3	1	-	31
CO2	2	3	3	3	3	3	2	1	3	3	2	-	2	30
CO3	2	3	-	2	-	3	3	1	3	3	1	2	2	25
CO4	3	3	-	3	2	3	3	3	3	3	3	1	-	30
CO5	3	3	2	1	-	-	3	3	3	2	2	3	-	25
<b>Grand Total of COs with PSOs and POs</b>														<b>141</b>
<b>Mean Value of COs with PSOs and POs(141/56)</b>														<b>2.51</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.51
Observation	COs of Income Tax II strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

Class : III B.COM Part : Core 18  
Semester : VI Hours : 75  
Subject Code : 22UCOD86 Credits : 04

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**ACCOUNTING FOR MANAGERS**

**1. Title of the paper: Accounting for Managers.**

**Course Objective (CO):**

1. To enlighten the students thought and knowledge on management Accounting
2. To impart the students on Financial Statement Analysis with the emphasis on the preparation of fund flow and cash flow statement.
3. To provide knowledge about budget control keeping in mind the scope of the concept.
4. To develop the know-how and concept of marginal costing with practical problems
5. To update the standard costing methods

**3. Five Units of Syllabus:**

UNITS	CONTENT	HOURS
I	Management Accounting – meaning, nature, scope, functions and objectives - Ratio analysis – advantages – classifications of ratios – profitability ratios, liquidity ratios, Solvency ratios and Turn over ratios.	15
II	Fund Flow Statement and cash Flow Statement – Meaning significance and preparation.	15
III	Budgetary Control –meaning, objectives – types of Budgets – Fixed and flexible budgets – cash and sales budgets – zero based budgeting	15
IV	Marginal Costing – Meaning, Definition – preparation of marginal cost statement, Applications. (Break Even Analysis, profit volume analysis)	15
V	Standard Costing – Meaning, Objectives – variance analysis – Material, Labour, overhead variances	15

**5. Text Book:**

1. S. Reddy and Dr.A. Murthy 2018, "Management Accounting" Margham Publications, Chennai.

**5. Reference Books:**

1. Ramachandran.R and Srinivasan.R, 2010 " Management Accounting", Sriram Publications, Tennur, Trichy.
2. Guru Prasad Murthy, 2006, "Management Accounting", Himalaya publishing house, Bombay.
3. Pillai R.S.N and Bagavathi, 2007 "Management Accounting"

**6. Teaching Learning Method**

PPT, Seminar, Quiz programme, Assignment, Chalk and talk

### 7. Course Outcome (CO):

After Completion of the Course Accounting for Managers the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	The students are able to develop the clear knowledge on management Accounting.	K2
CO 2	Students get practical training on cash flow and fund flow statement approach;	K2
CO 3	Students can obtain knowledge about budget control.	K3
CO 4	Student can solve the marginal costing problem easily.	K3
CO 5	Student will be expertise in the standard costing techniques.	K3

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	3	1		3	3	3		1	1	1		22
CO2	3	3	3	2	3	3	3	2	3	2	2	1	2	32
CO3	3	3	2	3	2	3	3	2	3	3	2	1	1	31
CO4	3	3	2	3	2	3	3	3	2	3	3	2	1	33
CO5	3	3	1	1		3	3	1	1		3	3	2	24
<b>Grand Total of COs with PSOs and POs</b>														<b>142</b>
<b>Mean Value of COs with PSOs and POs(/60)</b>														<b>2.36</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.36
Observation	COs of Accounting for managers strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514**  
**DEPARTMENT OF COMMERCE**

Class	: III B.Com	Part	: III Core 19
Semester	: VI	Hours	: 75
Subject Code	: 22UCOD96	Credits	: 04

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**1. Title of the paper:** Commercial Law

**2. Course Objectives (CO):**

To make the students

1. To Understand the basic principles and origin in the area of commercial law
2. To Obtain knowledge on bailment and pledge in the business
3. To Impart knowledge of sale of goods Acts
4. To understand the different types of liabilities, duties and rights of an agency.
5. To Aware of rights of women in the company.

**3. Five units of the Syllabus:**

UNITS	CONTENT	HOURS
<b>I</b>	Contract Act (Sec.1 to 75): Essentials of Valid contract-Offer-Acceptance Consideration, Capacity of Parties-Free Consent-Contingent agreement contract- Performance of Contract-Discharge of contract-breach of contract-Remedies for breach of contract. Contract of indemnity and guarantee.	<b>15</b>
<b>II</b>	Bailment and pledge(sec.148 to 181): Essentials – Rights and Duties of Bailer and Bailee-termination of bailment- pledge-rights and duties of pledge- pledge by non-owners- pledge distinguished from Mortgage- Finder of lost in goods	<b>15</b>
<b>III</b>	Sale of Goods Act(Sec.1 to 62): 'Delivery'. Documents of the title of goods, Bill of lading, Delivery order – formation of contract of sale -Distinction between sale and agreement to sell- Sale and Hire purchase-Essentials of sale- rights and duties of seller and Buyer- Rights of an unpaid seller- Quasi Contract	<b>15</b>
<b>IV</b>	Law of Agency: Meaning – Nature of Agency - Different kinds of Agents-methods of creating Agency-Extent of Agents Authority- Termination of Agency. Conditions and Warranties-Transfer of property in and title of goods. Duties, rights and responsibilities of an Agent.	<b>15</b>
<b>V</b>	Rights of women in the company: Rights to equal remuneration and opportunities (Equal Remuneration Act, 1976)- Right to harassment-free work environment (Sexual Harassment of Women at Workplace Act,2013)- Maternity benefit and Protection of employment (Maternity Benefit Act,1961)- Health and safety (The Factory Act,1948)- Mandatory board representation (Companies Act,2013)- Minimum wages Act,1948.	<b>15</b>

#### 4. Text Book:

1. Kapoor.N.D, 2006, "Elements of Mercantile Law", Sulthan& Chand, New Delhi.

#### 5. Reference Book:

1. Sundaram KPM &Varshney, "Introduction to Commercial Law", Kalyani Publications, New Delhi.
2. RSN Pillai and Bagavathi., Business Law, S.Chand, Delhi.
3. Ravinder Kumar and Virender Sharma, Practical Auditing, Prentice Hall of India Pvt. Ltd., New Delhi, 2012.

#### 6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk,

#### 7. Course Outcome: (CO)

After Completion of the Course Commercial Law the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the basic terms and be aware of the basic principles of commercial law.	K1
CO 2	Know the duties and rights of bailer and Bailee	K1 & K4
CO 3	Understand the delivery documents of sale of goods Acts, rights and duties of seller and buyer	K3
CO 4	Explain the different types of liabilities, duties and rights of an agency	K2
CO 5	Acquire knowledge on the rights of women in the company.	K4

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	1	1	-	3	3	-	1	-	3	2	3	23
CO2	3	3	2	1	1	3	2	1	-	-	2	2	1	21
CO3	3	3	2	2	-	3	1	-	1	3	-	1	-	19
CO4	3	3	1	3	1	3	2	2	-	-	3	1	2	24
CO5	3	2	-	2	3	3	2	2	3	1	3	-	3	27
<b>Grand Total of COs with PSOs and POs</b>														<b>114</b>
<b>Mean Value of COs with PSOs and POs(114/51)</b>														<b>2.23</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.23
Observation	COs of Commercial Law strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATIONS**

Class : III BCOM

Part : Core Elective II

Semester : VI

Hours: 45

Subject Code : 22UCOE26 (A)

Credit: 03

**HUMAN RESOURCE MANAGEMENT**

**1. Title of the Paper: Human Resource Management**

**2. Course Objectives (CO):**

1. To understand the basic concepts of Management and to study the contribution of management expert and their role.
2. To understand the organization structure, staffing and selection.
3. To evaluate the performance appraisal.
4. To enhance the knowledge about Human resource accounting and auditing.
5. To describe the wages and salary administration

**3. Five Units of syllabus:**

UNITS	CONTENT	HOURS
<b>I</b>	<b>Human Resources Management:</b> Meaning- Features- Scope and Functions of Human Resource Management-History of Human Resource Management- Role of HR Manager.-Human Resource accounting - E-HRM	<b>9</b>
<b>II</b>	<b>Job analysis &amp; Job description and Job specification:</b> Recruitment – concept and sources- Selection–Concept and Process- Test and Interview-Placement-induction-socialization- Retention.	<b>9</b>
<b>III</b>	<b>Training and Development:</b> Concept and importance- Training and development methods – Principles of Executive Development. <b>Performance Appraisal:</b> Concept- objectives- importance- methods of performance appraisal- transfer and promotions.	<b>9</b>
<b>IV</b>	<b>Human resource accounting and audit:</b> Human resource accounting -Meaning-Objectives-Need and limitations. Human resource audit- Nature-Benefits-Scope-Approaches.	<b>9</b>
<b>V</b>	<b>Compensation Management:</b> Wage and salary administration-managing wages- concept of rewards- methods of fixing remuneration- incentives-security measure - Methods of fixing remuneration- Incentives -Security Measures -Employer - Employee Relations.	<b>9</b>

**4. Text Book:**

1. Gupta .C.B., 2012, “Human Resource Management”, Sulthan Chand and Sons, New Delhi.

**5. Reference Books:**

- 1.SubbaRao. P, 2009, “Personnel and Human Resource Management”, Himalaya Publishing House, New Delhi.
- 2.Tripathi.P.C, 1997, “Personnel Management”, Dominant Publishers and Distributors.

**6. Teaching Learning methods:**

PPT, Lecture, Test, Assignment

## 7. Course Outcome (CO):

After Completion of the Course Human Resource Management the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Identify the basic principles and functions of management in functional areas of business and understand the contributions of experts to management thought.	K1&K2
CO 2	Develop the skills in job analysis and description.	K2
CO 3	Understand the training and development.	K2
CO 4	Evaluate the human resource accounting and audit.	K3
CO 5	understand the Wage and salary administration- managing wages- concept of rewards	K4

K1=Knowledge

K2=Understanding

K3=Application

K4=Analysis

K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	2	3	-	3	3	2	3	2	-	1	1	26
CO2	3	3	3	3	2	3	2	2	1		2	-	-	24
CO3	3	3	3	-	2	3	3	-	2	2	-	2	-	23
CO4	3	2	3	3	-	3	2	2	-	2	2	-	2	24
CO5	3	3	3	2	3	3	2	2	1	2	-	-	2	26
<b>Grand Total of COs with PSOs and POs</b>														<b>123</b>
<b>Mean Value of COs with PSOs and POs(123/51)</b>														<b>2.41</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.41
Observation	COs of Human Resource Management strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

**Class : III B.Com**  
**Semester : VI**  
**Subject Code : 22UCOE26 (A)**

**Part : Core Elective**  
**Hours : 45**  
**Credit : 3**

**1. Title of the Paper: ADVERTISEMENT AND SALESMANSHIP**

**2. Course Educational Objectives (CEO):**

- 1.To help the students to understand the advertising.
2. To make the students to plan for advertising.
- 3.To acquire the skill of advertisement budget and to learn ethics in advertising.
4. To Know salesmanship.
5. To learn selection and appointment of salesmanship.

**3. Five units of Syllabus:**

Unit	Content	Hours
1.	<b>Advertising</b> :Meaning, Definition and concept of advertisement. Means and types of advertising – commercial and non-commercial advertising, Objectives and functions of advertising	9
2.	<b>Planning For Advertising:</b> Strategic planning - Marketing plan - Advertising objectives - Communication response pyramid - Advertising Department - Organizing for advertising department - Functions of advertising management.	9
3.	<b>Advertisement Budget &amp; Ethics in Advertising:</b> Setting of advertising budget Factors affecting expenditures in a company. Ethics and code of conduct in advertising.	9
4.	<b>Salesmanship</b> : Meaning, Definition - Main elements of salesmanship - Advantages - Buying motives- Selling process	9
5.	<b>Saleman</b> - Meaning - Types - Qualities of salesman - Selection and appointment of salesmanship -Training, remuneration of salesmanship - Power of salesman.	9

**4.Text Book**

- 1.Advertising & Promotion: Belch & Belch, Tata McGraw Hill

**5. Book for References:**

- 1.Advertising: Sontakki, Himalaya Publishing House
2. Advertising Planning and implementation: Sharma and Singh, Prentice Hall
3. Advertising Management Concepts and Cases: Mahendra Mohan, Tata McGraw Hill
4. Promotion Management: Burnelt, Tata McGraw Hill.

**6. Teaching Methodology:**

PPT, Group Discussion, Chalk and Board and videos.

### 7. Course Outcomes (CO):

After Completion of the Course Advertisement and Salesmanship the students will be able to

S.No	Course Outcomes	Hours
1.	Familiarize the concept of advertising.	K1
2.	Make planning for advertisement.	K3
3.	Identify the best advertisement budget and learn ethics in advertising	K3
4.	Recognize the importance of salesmanship.	K3
5.	Know the process of selection and appointment of salesmanship.	K3

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

#### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	2	2	3	3	3	2	2	2	3	2	2	32
CO2	3	3	2	2	1	3	2	2	3		2	3	2	28
CO3	3	3	2		1	3	3	2	1		2	2	2	24
CO4	3	3	3	1	1	3	3	3	1	1		2	2	26
CO5	3	3	3	3	3	2	3	3	3	2	2	3	3	36
<b>Grand Total of COs with PSOs and POs</b>														<b>146</b>
<b>Mean Value of COs with PSOs and POs(146/61)</b>														<b>2.39</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.39
Observation	COs of Advertisement and Salesmanship Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMMERCE**

<b>Class</b> : III B.Com	<b>Part</b> : Core Elective
<b>Semester</b> : VI	<b>Hours</b> : 45
<b>Subject Code</b> : 22UCOE26 (B)	<b>Credit</b> : 3

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**1. Title of the Paper: Services Marketing**

**2. Course Educational Objectives (CEO):**

1. To help the students to understand the critical role of services marketing,
2. To enable the students to know the various concepts of services marketing like service quality, servicetriangle.
3. To highlights the conceptual framework of the principles, practices.
4. To acquire the techniques
5. To face the challenges to the services marketing in the global era.

**3. Five units of Syllabus:**

Unit	Content	Hours
1.	Services Marketing – Introduction – meaning – definitions – concept, Components and of Services – Services (or) Goods, Characteristics of Services and their Marketing implications – Product Support services – Pricing of Services – Innovation in Services.	9
2.	Service Quality – Service quality gap –Service quality audit – SERVQUAL –Services triangle Marketing Strategies for service firms –Information technology, Mass Communication.	9
3.	Marketing of Financial Services –Insurance, Mutual funds, Banking –Factoring –Marketing of Educational Services	9
4.	Health care Marketing – Hospitality and tourism Services – Entertainment Marketing – Transport Marketing – Day care Marketing	9
5.	CRM – Transaction Marketing (or) Relationships Marketing – Objectives of CRM – Implementing– Requisites for implementation of CRM – Levels of Relationship Strategies Tele communication marketing	9

**4. Book for References:**

1. Jochenwirtg , Christopher Lovelock, services Marketing, World Scientific Publishing, (US), 2016
- 2.S.L. Gupta, Marketing of Services, International Book House, 2012
3. S.M. Jha, Services Marketing, Himalaya Publishing House, New Delhi, 2013
4. Vasnathi Venugopal, Raghu VN , "Services Marketing" Himalaya Publishing house 2012.
5. SM.Jha, "ServicesMarketing" Himalaya Publishing House 2008.

**5. Teaching Methodology:**

PPT, Group Discussion, Chalk and Board and videos.

## 6. Course Outcomes (CO):

After Completion of the Course Services Marketing the students will be

S.No	Course Outcomes	Hours
1.	Familiarize the concept, components and classification of services.	K1
2.	Describe service quality gap, audit, and marketing strategies for service firms	K3
3.	Identify the various Marketing financial services	K3
4.	Recognize the Health care, tourism, and Day care marketing	K3
5.	the objectives and implementation of customer relationship management and responsible marketing on services managers	K3

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
CO1	3	3	2	2	3	3	3	2	2	2	3	2	2	32
CO2	3	3	2	2	1	3	2	2	3		2	3	2	28
CO3	3	3	2		1	3	3	2	1		2	2	2	24
CO4	3	3	3	1	1	3	3	3	1	1		2	2	26
CO5	3	3	3	3	3	2	3	3	3	2	2	3	3	36
<b>Grand Total of COs with PSOs and POs</b>														<b>146</b>
<b>Mean Value of COs with PSOs and POs(146/61)</b>														<b>2.39</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.39
Observation	COs of Services Marketing Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF COMMERCE**

**Class : III B. Com**

**Part : S.L.C**

**Semester : VI**

**Hours :**

**Sub. Code : 22UCOSL6**

**Credit : 3**

**1. Title of the Paper: Rural Marketing**

**2. Course Objectives (CO):**

1. To familiarize the students with basic concepts of rural marketing.
2. To study the agricultural marketing.
3. To understand the objectives of rural marketing and market regulation regulated market.
4. To know the distribution system in rural marketing.
5. To aware of institutional support to rural marketing.

**3. Five units of the Syllabus:**

<b>UNITS</b>	<b>CONTENT</b>	<b>HOURS</b>
<b>I</b>	Rural Marketing Concept --- Nature --- Scope --- Significance of Rural Marketing --- Factors contributing to Growth of rural markets --- Components and classification of Rural markets --- Rural Market VS Urban Market --- e -rural marketing.	
<b>II</b>	Agricultural Marketing – Concept --- Nature and Types of Agriculture produce --- concept and types of Agricultural Markets --- Marketing channels --- Methods of Sales --- Market functions	
<b>III</b>	Rural Marketing and Market Regulation Regulated Market --- APMC Act 1963 --- Model bill Standardization and Grading --- Inspection of quality control --- Inspection of AGMARK --- Indian Standers and Grade Specifications --- Food Products order (FPO) 1955 --- Consumer Protection Act 1986. --- The National Council for State Marketing Boards (NCOSAMB) State Trading corporation (STC), Public Distribution System (PDS).	
<b>IV</b>	Distribution System in Rural Marketing The National Co-operative Development Corporation (NCDC), Food Corporation of India (FCI), Panchayat Mandi --- State Agriculture Marketing Banks --- Future of Rural marketing	
<b>V</b>	Institutional Support to Rural Marketing – Commission on Agriculture Costs and Prices (CACP), National Agriculture Co-operative Marketing Federation (NAFED), Agriculture and Processed Food Exports Development Authority (APEDA)	

**Text Book**

1. Natarajan L, Logistics and Supply chain Management, Margham Publications, Chennai, 2016.

**References Books**

1. Bowersox Logistical Management, Mc-Graw Hill, Chennai, 2017.
2. Reguram G, Rangaraj N, Logistics and Supply Chain Management: Cases and Concepts, Macmillan India Ltd., New Delhi, 2017.
3. Coyle, Bradi&Longby, The Management of Business Logistics, Third Edition, West Publishing Company, USA, 2016.

## 6. Teaching Learning Methods:

Giving Guidance, provide study material

## 7. Course Outcome (CO):

After Completion of the Course Rural Marketing the students will be able to

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Understand the basic concepts of rural marketing.	K1
CO 2	Acquire knowledge on agricultural marketing.	K2
CO 3	Identify the Rural Marketing and Market Regulation Regulated Market	K3
CO 4	Know the distribution System in Rural Marketing	K3
CO 5	Knowledge on Institutional Support to Rural Marketing	K2

K1=Knowledge K2=Understanding K3=Application K4=Analysis K5=Synthesis

### Mapping of COs with PSOs and POs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs and POs
Outcomes														
CO1	3	3	1	1	-	3	3	-	1	-	3	2	1	21
CO2	3	3	2	1	1	3	2	1	-	-	2	2	1	21
CO3	3	3	2	2	-	3	1	-	1	3	-	1	-	19
CO4	3	3	1	3	1	3	2	2	-	-		1	2	21
CO5	3	2	-	2	3	3	2	2	3	1			2	23
<b>Grand Total of COs with PSOs and POs</b>														<b>105</b>
<b>Mean Value of COs with PSOs and POs(105/50)</b>														<b>2.1</b>

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs		2.00	2.1
Observation	COs of Rural Marketing strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**PG DEPARTMENT OF COMMERCE- B.Com. (General)**

**CBCS Pattern (From 2022-2023) onwards**

<b>I SEMESTER</b>				
<b>PART</b>	<b>SUBJECT CODE</b>	<b>PAPER</b>	<b>Hrs</b>	<b>Cr</b>
I	22UTML11/ 22UHNL11/ 22UFNL11	Tamil/Hindi/French	06	04
II	22UENB11	English through Prose & Short Story (Stream B)	05	04
III		Core		
	22UCOC11	Advanced Accountancy-I	06	05
	22UCOC21	Principles of Insurance	06	05
	22UCOA11	Allied –I Fundamentals of Economics	05	04
IV	22UFCE11	FC – Personality Development	01	01
	22UCSH12	Communication Skills	01	
	22UBRC11	Bridge Course	-	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC / NSS /Phy. Edn. / YRC ROTARACT /AICUF/ NCB	---	---
		Total	30	24
<b>II SEMESTER</b>				
I	22UTML22/ 22UHNL22/ 22UFNL22	Tamil/Hindi/French	06	04
II	22UENB22	English through Prose & Poetry (Stream B)	05	04
III		Core		
	22UCOC32	Advanced Accountancy-II	06	05
	22UCOC42	Fundamentals of Computer– Theory	04	02
	22UCOP12	Practical	02	02
	22UCOA22	Allied – II Introduction to Marketing	05	04
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	01	01
	22UCSH12	Communication Skills	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC / NSS /Phy. Edn. / YRC ROTARACT /AICUF/ NCB	--	01
		Total	30	24
<b>III SEMESTER</b>				
		<b>TAMIL</b>	06	05
III		Core		
	22UCOC53	Partnership Accounts	06	05
	22UCOC73	Banking Theory, Law and Practices	06	04
	22UCOA33	Allied – III Business Mathematics	05	04

IV	22UCON13	Basic Tamil/Advanced Tamil Non Major Elective to Science Students - Retail Marketing	03	02
	22UCOS13	SBE – I Business Communication	03	02
	22UFCE33	FC – Environmental Studies	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NCC / NSS /Phy. Edn. / YRC ROTARACT /AICUF/ NCB	---	---
	22UARE14	ARISE	----	---
		Total	30	22
<b>IV SEMESTER</b>				
		<b>TAMIL</b>	06	05
III		Core		
		<b>Corporate Accounting</b>	06	05
	22UCOP44	E-Commerce	06	04
	22UCOA44	Allied IV - Business Statistics	05	04
IV	22UCON24	Non Major Elective to Arts Students – 1.E – Tailing	03	02
	22UCOS24	SBE - II Entrepreneurship Development	03	02
	22UFCH44	FC – Religious Literacy and Peace Ethics	01	01
V	22UNCC/NSS/ PED/YRC/ROT/ACF /NCB24	Extension Activities NCC / NSS /Phy. Edn. / YRC ROTARACT /AICUF/ NCB	---	01
	22UARE14	ARISE	---	01
		Total	30	24
<b>V SEMESTER</b>				
III		Core		
	22UCOD15	Cost Accounting	05	05
	22UCOD25	Income Tax -I	05	04
	22UCOP55	Auditing	05	04
	22UCOD35	International Business	05	04
		<b>Business Management</b>	05	04
	22UCOE15	Core Elective I – Indian Financial System Investment management Portfolio Management	03	03
IV	22UINT15	Internship (Holidays)	-	01
	22USSI16	Soft Skills	02	--
		Total	30	25
<b>VI SEMESTER</b>				
III		Core		
	22UCOD56	Accounting Software in Business - Theory	02	03
	22UCOP26	Practical	04	02
	22UCOD66	Income Tax II	05	04

	22UCOD76	Accounting for Managers	05	04
	22UCOD86	Commercial Law	05	04
	22UCOD96	Institutional Training	04	03
	22UCOE26	Core Elective- II - Human Resource Management Advertising and Salesmanship Services Marketing	03	03
IV	22USS116	Soft Skills	02	02
		Total	30	25

Semester	I	II	III	IV	V	VI	Total
Credits	24	24	22	24	25	25	144

### Self Learning Courses - Additional Credits

Semester	Credits
III	3
IV	3
V	3
VI	3

**DEPARTMENT OF  
BUSINESS ADMINISTRATION**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

**CBCS STRUCTURE for BBA**

**(For the Students who joined in the Academic Year 2022-23)**

<b>I SEMESTER</b>				
<b>Part</b>	<b>Sub.Code</b>	<b>PAPER</b>	<b>Hrs</b>	<b>Cr</b>
I	22UTAL11/ 22UHNL11/ 22USNL11	Tamil/ Hindi/ French	05	04
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream - B	05	04
III	22UBAC11	Core – 1 Management Thought and Process	06	05
	22UBAC21	Core – 2 Office Administration	06	05
	22UBAA11	<b>Allied – 1</b> Accounting for Managers	<b>05</b>	<b>04</b>
IV	22UFCE11	Foundation Course – Personality Development	01	01
	19UCSH12	Communication Skills	01	-
	22USSI16	Soft Skills	01	-
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NCC/NSS /PHY.EDN./YRC/ ROTARACT/AICUF/Nature Club	-	-
	22UBRC11	Bridge Course	-	01
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>II SEMESTER</b>				
I	22UTAL22/ 22UHNL22/ 22USNL22	Tamil/ Hindi / French	05	04
II	22UENA22/ 22UENA22	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream – B	05	04
	22UBAC32	Core – 3 Business Environmental Management	06	05
	22UBAC42	Core – 4 Entrepreneurship Development	06	04
	22UBAA22	<b>Allied – 2</b> Introduction to Statistics	05	04
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	01	01
	22UCSH12	Communication Skills	01	1
	22USSI16	Soft Skills	01	-
V	22UNCC/NSS/ PHY.EDU./ YRC/ROT/ACF/ NCB12	Extension Activities NCC/NSS/PHY.EDN./ YRC/ROTARACT/AICUF/Nature Club	-	01
		<b>Total</b>	<b>30</b>	<b>24</b>

III SEMESTER				
III	22UBAC53	Core – 5 Organisational Behaviour	06	05
	22UBAC63	Core – 6 Company Organisation	06	04
	22UBAC73	Core – 7 Principles of Marketing	05	04
	22UBAA33	<b>Allied – 3 Business Mathematics</b>	<b>05</b>	<b>04</b>
IV	22UBAN13	<b>(To choose any 1 out of 3)</b> Basic Tamil/Advanced Tamil/Non-major Elective – 1.Introduction to Marketing Management 2. Introduction to Organisational Behaviour 3. Introduction to Tourism Management	03	02
	22UBAS13	<b>(To choose any 1 out of 3)</b> Skill Based Elective – 1 1. Executive Communication – 1 2. Time Management 3. Creativity and Innovation Management	03	02
	22UFCE33	F C – Environmental Studies	01	01
V	22UNCC/NSS/ PHY.EDU./ YRC/ROT/ACF/ NCB24	Extension Activities NCC /NSS /PHY.EDN. / YRC/ROTARACT / AICUF / NATURE CLUB	--	--
	22UARE14	ARISE	--	--
	22USS16	Soft Skills	01	-
		<b>Total</b>	<b>30</b>	<b>22</b>
IV SEMESTER				
III	22UBAC84	Core - 8 Human Resource Management	06	05
	22UBAC94	Core – 9 Managerial Economics	06	04
	22UBAD04	Core - 10 Legal Aspects of Business	05	04
	22UBAA44	<b>Allied – 4 Operations Research</b>	05	04
IV	22UBAN24	<b>(To choose any 1 out of 3)</b> Basic Tamil/Advanced Tamil/Non-Major Elective – 1. Essentials of Leadership 2. Introduction to Rural Marketing 3. E-Business	03	02
	22UBAS24	<b>(To choose any 1 out of 3)</b> <b>Skill Based Elective 2 –</b> 1. Executive Communication – 2 2. Digital Marketing 3. Business Case Analysis	03	02
	22UFCH44	F C –Religious Literacy and Peace Ethics	01	01

V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/ NCB24	Extension Activities NCC /NSS/Phy.Edn. / YRC/ROTARACT / AICUF / Nature Club	-	01
	22UARE14	ARISE	-	01
	22USSI16	Soft Skills	01	-
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>V SEMESTER</b>				
III	22UBAD15	Core - 11 Introductions to Operations Management	05	05
	22UBAD25	Core - 12 Services Marketing	05	05
	22UBAD35	Core - 13 Business Research Methods	05	04
	22UBAD45	Core - 14 Financial Management	05	03
	22UBAD55	Core - 15 Institutional Training	04	04
IV	22UBAE15	<b>(To choose any 1 out of 3)</b> Core Elective – 1 1. Computer Application in Business 2. ICT Skills 3. Digital and Social Media Marketing	04	03
	22UINT15	Internship	-	1
	22USSI16	Soft Skills	02	-
		<b>Total</b>	<b>30</b>	<b>25</b>
<b>VI SEMESTER</b>				
III	22UBAD66	Core- 16 Modern Sales Management	05	05
	22UBAD76	Core - 17 Export Documentation & Procedure	05	04
	22UBAD86	Core – 18 Advertising Management	05	04
	22UBAD96	Core – 19 Business Policy & Strategic Management	05	04
	22UBAT06	Core – 20 Project	04	03
IV	22UBAE26	<b>(To choose any 1 out of 3)</b> Core Elective – 2 1. Financial Accounting Package using Tally 2. Business Ethics 3. Customer Relationship Management	04	03
	22USSI16	Soft Skills	02	02
		<b>Total</b>	<b>30</b>	<b>25</b>

Semester	I	II	III	IV	V	VI	Total
Credits	24	24	22	24	25	25	144

Part – I	08
Part – II	08
Part – III	
Core	86
Allied	16
Core Electives	06
Total	108
Part – IV	
Non-Major Electives	04
Skill based Electives	04
Value Education	04
Total	12
Part – V	02
Bridge Course	01
Arise	01
Communication Skill	01
Soft Skill	02
Internship	01

#### **Self-Learning Courses – Additional Credits**

<b>Semester</b>	<b>Sub. Code</b>	<b>Title</b>	<b>Credit</b>
III	22UBASL3	Body Language	03
IV	22UBASL4	Group Discussion	03
V	22UBASL5	Stress management	03
VI	22UBASL6	Business Etiquette	03

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

Title (Core – 11)	<b>INTRODUCTIONS TO OPERATIONS MANAGEMENT</b>	Course Code	22UBAD15
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	75
Semester	<b>V</b>	Credit	05
Course Educational Objectives(CEO)	1. Introduce Production and Operations management concepts. 2. Evaluate the principles and techniques of plant location and layout and its implications. 3. Distinguish work study from method study. 4. Interpret the techniques of production planning and control. 5. Analyze and formulate best controlling methods.		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Introduction to Operations Management</b> Operations Management: meaning, -scope- Functions-historical developments – functions & responsibilities of a production manager-relationship of production with other functions - types of production	15	
II	<b>Plant Location &amp; Plant Layout</b> Plant Location -Factors affecting location-. Plant Layout: Objectives- Types of layout-techniques of plant out – organization of physical facilities- building, lighting, safety-protection measures.	15	
III	<b>Manufacturing system and Work study</b> Production system: Types - Work Study: Objectives-Importance- Components. Method study: Indicators-Techniques- Introduction of AI in work measurement.	15	
IV	<b>Material Management</b> Materials management: Objectives- Stages-Factors-Importance. Purchasing: Objectives- Functions- Methods-Steps. Store Keeping: Functions- Working of store keeping – Implementation of AI in material management.	15	
V	<b>Plant Maintenance and Quality Control</b> Plant Maintenance: Objectives-Functions-Types-Merits and demerits. Material handling: Functions-Principles-Equipments. Quality Control: Objectives-Phases-Steps-Control Charts.	15	
<b>Books for Study</b>	1. Goel.B.S. <i>Productions and Operations Management</i> , Pragati Publication, New Delhi, 2021. 2. Aswathappa A.K, SridharaBhat.K, <i>Production Management</i> , Himalaya Publications House, New Delhi, 2023		

<b>Books for Reference</b>	1. PaneerSelvam, Production and Operations Management, Prentice Hall of India, New Delhi, 2019. 2. P.Saravanel&S.Sumathi, Production and Materials Management, Margham Publication, Chennai, 2020.
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**Teaching and learning methods**

- Class Lecture
- Video Clippings
- Interact
- ICT (Information communication Technology)

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Cite the meaning, scope, functions and problems in production management.	<b>K1</b>
<b>CO 2</b>	Suitable plant locations and design a plant layout.	<b>K2</b>
<b>CO 3</b>	Identify different types of work study and method study	<b>K3</b>
<b>CO 4</b>	Understand techniques of production planning and control	<b>K4</b>
<b>CO 5</b>	Plant maintenance and control quality through various quality control techniques	<b>K5</b>

**Mapping Course Outcome**

Objectives Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
	CO1	3	3	3			3	3				3		
CO2	3	3	3				3		3	3				18
CO3						3	3	2	3	3	3			17
CO4		3	3				3		3					12
CO5	3	3				3	3		3	3				18
Grand Total of Cos with PSOs and POs														83
Mean Value of Cos with PSOs and POs=83/28														2.96

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			2.96
Observation	<b>Cos of Introductions to Operations Management –Strongly related with PSOs and POs</b>		

**K1=Remember, K2 =Understand, K3=Apply, K4=Analyze, K5=Evaluate, K6=Create**

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**

Title(Core-12)	<b>SERVICES MARKETING</b>	Course Code	22UBAD25
Class	<b>II BUSINESS ADMINISTRATION</b>	Hours	75
Semester	<b>V</b>	Credit	05
Course Educational Objectives(CEO)	<ol style="list-style-type: none"> <li>1. To provide the basic insights on marketing of services.</li> <li>2. To educate the students on analyzing the opportunities available and to select the target market.</li> <li>3. To impart knowledge on 4P's of services marketing.</li> <li>4. To provide in depth knowledge on the process of services marketing mix</li> <li>5. To explore the various kinds of services marketing.</li> </ol>		
<b>Unit</b>	<b>Content</b>		<b>No. of Hours</b>
I	<b>Introduction to Services Marketing</b> Introduction , The services concept- Service Industry –Nature of Services, Characteristics of Services, Classification of Services – Difference between goods and services- Importance of Services Marketing - The Growth in Services – Global & Indian Scenarios.		15
II	<b>Segmentation, Targeting and Positioning</b> Segmentation- Segmentation Strategies- bases for segmentation. Target market selection- guidelines for selection target market, Approaches to target market. Positioning- positioning services, Effective positioning, Positioning a Service in the Marketplace, process.		15
III	<b>The service Marketing Mix</b> Service Product- Service Life Cycle, Service Design Pricing- The Pricing challenge, Place-Distribution of service, Promotion- selection of communication mix, Guidelines for service communication.		15
IV	<b>Services Marketing Mix</b> People in service-Employees- Women in Services -Process - Physical evidence – Types of service scapes – Dimensions – Role of physical evidence in service marketing		15
V	<b>Marketing of Services</b> Marketing of services–financial services–Health services–Travel & Tourism Marketing–Hospital and Airline marketing, AI in service industry, Relevant case studies.		15
<b>Books for Study</b>	1.Rampal. M.K & Gupta S. L , Service marketing , Galgotia Publishing, New Delhi 2000.		

<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. S.M.Jha, Services Marketing –Himalaya Publishing House,2008.</li> <li>2. . Valarie A Zeithaml , Services Marketing: Integrating Customer Focus Across the Firm, Second Edition, McGraw-Hill 2003.</li> <li>3. Christopher Lovelock , , Services Marketing : People, Technology &amp; Strategy, Seventh Edition, Pearson Education, New Delhi 2011</li> <li>4. Rajendra narkundar, Services Marketing –Tata McGraw-Hill- New Delhi,2008.</li> <li>5. Vasanthi Venu Gopal, Raghu.V.N, Service Marketing –Himalaya Publishing House, 2012.</li> </ol>
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**Teaching and learning methods**

- Class Lecture
- Video Clippings
- Interact
- ICT (Information communication Technology)

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Explicate the various concepts in service marketing.	<b>K2</b>
<b>CO 2</b>	Appraise the way to analyse and to select the target market.	<b>K5</b>
<b>CO 3</b>	Understand knowledge on 4P's of service marketing mix	<b>K3</b>
<b>CO 4</b>	Recognise the process of service marketing mix	<b>K3</b>
<b>CO 5</b>	Summarise knowledge on different kinds of services marketing.	<b>K2</b>

**Mapping Course Outcome**

Objectives	PSO	PSO	PSO	PSO	PSO	PO	Sum of Cos with PSOs& POs							
	1	2	3	4	5	1	2	3	4	5	6	7	8	
CO1		3	3			3	3			3	3			18
CO2			3				3			3	3			12
CO3	3		3		3			2	3					14
CO4				2		3			3		3			11
CO5	3	3	3			3	3				3			18
Grand Total of Cos with PSOs and POs														73
Mean Value of Cos with PSOs and POs=73/25														2.92

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			2.92
Observation	<b>Cos of Services Marketing – Strongly related with PSOs and POs</b>		

**K1=Remember, K2 =Understand, K3=Apply, K4=Analyze, K5=Evaluate, K6=Create**

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

Title (Core – 13)	<b>BUSINESS RESEARCH METHODS</b>	Course Code	22UBAD35
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	75
Semester	<b>V</b>	Credit	04
Course Educational Objectives(CEO)	1.Introduce the concepts of research 2. Choose the appropriate design and sampling 3. Interpret data collection techniques and scaling techniques. 4. Write research report to suit their purpose 5. Analyze Recent trends in Research		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Introduction to Research</b> Introduction – Meaning – Characteristics – Objectives – Scope – Types of Research – Research Methods vs. Research Methodology, Research Process – Ethics in Research.	15	
II	<b>Research Design and Sampling</b> Meaning – Significance – Research Design – Concepts – Classifications - Sampling Fundamentals – Need for Sampling – Methods of Sampling – Steps in Sampling Design – Characteristics of a good sample design	15	
III	<b>Data Collection and Analysis</b> Hypothesis formulization- Methods of Data Collection - Primary data - Secondary data - Tools - Questionnaire – Schedule - Measurement and scaling Techniques - Analysis of Data --Chi Square Test - t test.	15	
IV	<b>Report Writing</b> Report Writing- Importance – Steps – Types – Layout Format of report writing - Problems encountered by Researchers in India – Role of computer in Research.	15	
V	<b>Recent Trends in Research Methodology</b> Statistical Package for Social Sciences – Data Input and validation – Application of Tools – Introduction of AI.	15	
<b>Books for Study</b>	1. Kothari.C.R. &Gaurav Garg, Research Methodology, Methods and Techniques, (New Age International and Publishers, New Delhi, 2021.		
<b>Books for Reference</b>	1. Rao K.V., Research Methodology in Commerce and Management, Sterling Publishers Pvt. Ltd., Chennai, 2020 2. Donald R.Cooper and Pamela S.Schindler, Business Research Methods, TATA McGraw Hill. New Delhi, 2021.		

### Teaching and learning methods

- Class Lecture
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

### Course Outcome (CO)

On successful completion of the course, the student able to

<b>CO 1</b>	Identify and formulate a problem for research	<b>K1</b>
<b>CO 2</b>	Choose the appropriate tools and techniques of sampling	<b>K2</b>
<b>CO 3</b>	Prepare a suitable methods for data collection	<b>K3</b>
<b>CO 4</b>	Write research report to suit their purpose.	<b>K2</b>
<b>CO 5</b>	Aware recent trends in research methodology	<b>K2</b>

### Mapping Course Outcome

Objectives	PSO	PSO	PSO	PSO	PSO	PO	Sum of Cos with PSOs& POs							
	1	2	3	4	5	1	2	3	4	5	6	7	8	
CO1	3	3	3			3	3		3		3			21
CO2	2		3		2		2				2			11
CO3	2	3				3	2	2	3		3			18
CO4		2	3		2		2			3	2			14
CO5	3	2	3			3	2		2	3	3			21
Grand Total of Cos with PSO sand POs														85
Mean Value of Cos with PSOs and POs=85/33														2.57

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			2.57
Observation	<b>Cos of Business Research Methods–Strongly related with PSOs and POs</b>		

**K1=Remember, K2 =Understand, K3=Apply, K4=Analyze, K5=Evaluate, K6=Create**

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625514**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

Title (Core 14)	<b>FINANCIAL MANAGEMENT</b>	Course Code	22UBAD45
Class	<b>BBA</b>	Hours	75
Semester	<b>V</b>	Credit	03
Course Educational Objectives(CEO)	<ol style="list-style-type: none"> <li>1. To introduce the fundamentals of financial management.</li> <li>2. Discuss the sources of finance and various investment decisions.</li> <li>3. Explore the cost of capital and optimum capital structure.</li> <li>4. Preparation of working capital statement and dividend decisions.</li> <li>5. Discuss the recent trends in Financial Management.</li> </ol>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Introduction to Financial Management</b> Financial Management – Definition – Nature – Scope - History – Objectives of the firm- Functions of Finance – Investment decisions- Financing decision – Dividend Decision.	15	
II	<b>Investment Decisions</b> Sources of capital – Security financing – Shares – Debt - Internal Financing –Term loans – Specialized Financial Institutions – Short term sources – Innovative sources of capital – Capital Budgeting – Features – Significance – Process & Techniques.	15	
III	<b>Financing Decisions</b> Cost of capital – Cost of equity – cost of preference – cost of debt – cost of retained earnings – Weighted average cost of capital - Simple problems – Capital structure – Determination – Optimum capital structure – Simple problems.	15	
IV	<b>Working Capital Management &amp; Dividend Decisions</b> Working capital management – Determination of working capital – Types – Simple problems - Dividend decision - factors affecting dividend decision, Forms of dividend.	15	
V	<b>Recent Trends In Financial management</b> Blockchain – Enterprise, Social & Governance Model – Automation - Artificial Intelligence in Financial Management.	15	
<b>Text Books</b>			

1. Prasanna Chandra, "Financial Management – Theory and Practice 10<sup>th</sup> Edition" – Tata McGraw Hill, New Delhi, 2021
2. Khan and Jain, Financial management – Text and Cases – Tata McGraw Hill, New Delhi, 2020

#### Reference Books

1. I.M.Pandey, "Financial Management" - Vikas Publishing, New Delhi, 2016
2. M.Y. Khan and P.K. Jain, "Financial Management – Text, Problems and Cases" 8<sup>th</sup> Edition - Tata McGraw Hill, New Delhi, 2018
3. [Sheridan Titman](#), Arthur J. Keown, et al, "Financial management – principles and Applications" 13<sup>th</sup> Edition – Pearsons, New Delhi, 2019

#### Teaching and learning methods

- Class Lecture
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

#### Course Outcome (CO)

On successful completion of the course, the student able to

<b>CO 1</b>	Gain knowledge on Financial management	<b>K1</b>
<b>CO 2</b>	Familiarize with the sources of finance	<b>K2</b>
<b>CO 3</b>	Prepare the cost of capital statement and Cash budget statement	<b>K3</b>
<b>CO 4</b>	Prepare working capital statement and cash budgets	<b>K3</b>
<b>CO 5</b>	Understand recent trends in financial management	<b>K2</b>

#### Mapping Course Outcome

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3		2		3		2		3	2				15
CO2		3		3	3	3		3	3					18
CO3	3				2					3				08
CO4		3				2	2	3	2	3				15
CO5		2	3	3	2	3				3				16
Grand Total of Cos with PSOs and POs														72
Mean Value of Cos with PSOs and POs=72/27														2.66

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			2.66
Observation	<b>Cos of Financial Management–Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) –KARUMATHUR**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**  
**INSTITUTIONAL TRAINING**

Class	: III BBA	Part	: III Core-15
Semester	: V Semester	Hours	: 60
Subject Code	: 22UBAD55	Credit	: 04

**Course Objectives:**

1. To compare the theories learned and the actual practices prevailing in the business environment
2. Develop knowledge on basic business strategies
3. To demonstrate an ability to produce a clear report, this includes critical reflection on the general implications and conclusions of the work carried out.

**Course Outcomes**

1. Gain confidence from experience-based learning
2. Familiarize industrial practices prevailing in the business environment
3. Specialized in drafting clear report

**Description:**

The institutional training is an essential requirement and integral part of the curriculum for successful completion of the BBA programme. It is designated for BBA students to improve their business skills and provide them with practical experience. The essence of the institutional training is to help the students develop the ability to apply multi-disciplinary concepts, tools and techniques to solve organizational problems.

**Supervision, dates and Duration of the Institutional Training**

Every student has to undergo an institutional training for a minimum period of 4 weeks after completing the Fourth semester and before the start of fifth semester. All the students will have to submit their institutional report within a period of one month in the department. Each student will be attached to one faculty guide, with whom he/she shall be in continuous touch during the training period. The faculty guide will evaluate the report for 25 marks and the corresponding industrial is to evaluate the report for 25 marks. The evaluation of the remaining 50 marks shall be made by the department during viva voce on the basis of the students' performance during the Viva-Voce. The student's shall submit 2 copies of training reports within two months after the commencement of the 5<sup>th</sup> semester.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

Title (Core Elective - 1)	<b>COMPUTER APPLICATIONS IN BUSINESS</b>	Course Code	22UBAE15(A)
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	<b>60</b>
Semester	<b>V</b>	Credit	<b>03</b>
Course Educational Objectives(CEO)	1. Impart knowledge on computer skills 2. Discuss about Ms Word skills 3. Guide them in preparing Ms Power point 4. Inculcate the ways of preparing Ms Excel 5. Develop knowledge on Artificial intelligence and Machine learning		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>COMPUTER FUNDAMENTALS</b> Definition – Characteristics- components of computer system Hardware – Input devices- Output Devices – Processor- storage – software-operating system.	12	
II	<b>MS WORD</b> Starting with Ms-word – Understanding the start screen – creating a new blank – document – The word screen – understanding the quick access tool bar – understanding the status bar – creating documents – typing text – the save as place – Tables in Ms-Word – Printing documents	12	
III	<b>MS POWERPOINT</b> Introduction to PowerPoint- Window Layout – Slide –AutoContent Wizard- Templates – Creating a presentation – Transition and Animation Effects – Saving a presentation – Active buttons in slideshow.	12	
IV	<b>MS EXCEL</b> Introduction to Excel – Window Layout – Working with Worksheet – Entering data into cells – Printing and Formatting Worksheets – Alignment– Working with Fonts, Borders and cell – Using Functions – Percentage - Standard Deviation - Mean Deviation - Correlation - Creating a chart.	12	
V	<b>ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING</b> Meaning of Artificial Intelligence – Need and	12	

	importance of AI– origin of Ai – Applications of AI – Future of AI in Business /Accounting/ Auditing/ - Challenges and Ethical considerations of AI. Machine learning fundamental & common use cases – Approach to Machine Learning understanding.	
<b>Books for Study</b>	1. Sushila Madhan. 2017. Computer Applications in Business. Scholar Tech Press	
<b>Books for Reference</b>	1. Dr.R.Parameswaran. 2018. Computer Applications in Business. S.Chand& Co Ltd 2. H N Tiwari and Hem Chand Jain. 2020. Basics of Computer Applications in Business. Taxmann Publications 3. A.RajathiP.Chandran. 2017. SPSS for you. MJP Publishers, Chennai	

### Teaching and learning methods

- Class Lecture
- Lab classes
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

### **Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Familiar with the elements of computer skills	<b>K1</b>
<b>CO 2</b>	Gain knowledge on Ms Word Skills	<b>K2</b>
<b>CO 3</b>	Specialized in preparing Ms Power point	<b>K3</b>
<b>CO 4</b>	Prepare documents using Ms Excel	<b>K3</b>
<b>CO 5</b>	Understand the concepts of Artificial intelligence and Machine learning	<b>K2</b>

### Mapping Course Outcome

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1				3		3		3						09
CO2					3				3		2			08
CO3		3	2							2	2			09
CO4				2	3			3			3			11
CO5				1	2			2	3		3			11
Grand Total of Cos with PSOs and POs														48
Mean Value of Cos with PSOs and POs=48/19														2.52

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			2.52
Observation	<b>Cos of Computer Applications in Business –Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-  
625514 DEPARTMENT OF BUSINESS ADMINISTRATION**

Title(Skill Based Elective)	<b>ICT SKILLS</b>	Course Code	22UBAE15 (B)
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	<b>60</b>
Semester	<b>V</b>	Credit	<b>03</b>
Course Educational Objectives(CEO)	<ol style="list-style-type: none"> <li>1. Introduce the basics of documentation techniques</li> <li>2. Exhibit worksheet manipulation techniques</li> <li>3. Demonstrate animation in presentations</li> <li>4. Inculcate data modeling techniques</li> <li>5. Explain basics of Information Technology</li> </ol>		
<b>Unit</b>	<b>Content</b>	<b>No.of Hours</b>	
I	<b>DOCUMENTAION</b> Home–Edit– insert –Page Layout –View-Reference.	12	
II	<b>WORKSHEETMANIPULATION</b> Categories– formulas – formatting – charts – data Analysis –Pivot Table.	12	
III	<b>PRESENTATIONS</b> Design–customs Animation–Transition–Setup Slideshow	12	
IV	<b>DATABASE</b> Data modeling–Relational Approach–Normalization-Entity relationship Diagram – Client server Technology –Basics of Access	12	
V	<b>INFORMATION TECHNOLOGY</b> Introduction to IT and its development, Impact and Future of IT in Business Organization, Overview of the following: 4 GL, Image processing, Virtual Reality, Video Conferencing, Decision Support System, Artificial Intelligence, and Machine Learning	12	
<b>Books for Study</b>	1.Walkenbach,J.(2010).Excel 2010Formulas.NewDelhi:WileyPublishing		
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. David Reed. 2007 .Basic introduction to computer science. Prentice Hall India. New Delhi.</li> <li>2. Xavier.C.2005.BasicConceptsofComputer.TataMcGrawHill,New Delhi.</li> <li>3. JameB.Cunningham&amp;JamesO.Aldrich2012.UsingSPSS:AnInteractive Hands-On Approach. SAGE Publications India Pvt Ltd, New Delhi.</li> </ol>		

### Teaching and learning methods

- ☐ Class Lecture
- ☐ Video Clippings
- ☐ Interact
- ☐ ICT(Information communication Technology)

### Course Outcome (CO)

On successful completion of the course, the student able to

<b>CO 1</b>	Recall the basics of documentation techniques	<b>K1</b>
<b>CO 2</b>	Apply worksheet manipulation techniques	<b>K3</b>
<b>CO 3</b>	Apply animation in presentations	<b>K2</b>
<b>CO 4</b>	Apply knowledge on data modeling techniques	<b>K3</b>
<b>CO 5</b>	Summarize basis of information technology	<b>K3</b>

### Mapping Course Outcome

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of Cos with PSOs & POs
CO1				3		3		3						09
CO2					3				3		2			08
CO3		3	2							2	2			09
CO4				2	3			3			3			11
CO5				1	2			2	3		3			11
Grand Total of Cos with PSOs and POs														48
Mean Value of Cos with PSOs and POs=48/19														2.52

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			2.52
Observation	<b>Cos of ICT Skills –Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**

Title (Core Elective - 1)	<b>DIGITAL AND SOCIAL MEDIA MARKETING</b>	Course Code	22UBAE15 (C)
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	<b>60</b>
Semester	<b>V</b>	Credit	<b>03</b>
Course Educational Objectives(CEO)	1. Impart knowledge on Digital and Social media marketing 2. Discuss about digital marketing mix 3. Guide them in preparing social media management 4. Inculcate the ways of marketing in social media 5. Develop knowledge on Social analytics		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Introduction to digital and social media marketing:</b> Meaning -definition-types of social media websites-mobile apps-email-social media-various social media websites; Blogging-types, platforms.	12	
II	<b>Digital Marketing Mix:</b> Online Advertising, Lead Generation, Social Media Marketing, Content and Copywriting. Influencer Marketing: Influencer, Payment to Influencer, difference between influencer marketing and celebrity endorsements.	12	
III	<b>Social Media Management:</b> -Social Media and Target Audience- Sharing content on Social Media-Book marking websites; DO's and Don'ts of Social media.	12	
IV	<b>Social Media for Marketing</b> Facebook, LinkedIn, Twitter, YouTube. Establishing Relationship with customers Social Media.	12	
V	<b>Social Analytics</b> Automation and Social Media- Social Media and other types of Marketing,	12	

	Managing Tools of Social Media, Women in Social Media, Role of Artificial Intelligence in Digital and Social Media Marketing	
<b>Books for Study</b>	1. Digital Marketing: Seema Gupta-McGraw hill, 2020 2. Social Media Marketing: Tracy L. Tuten, SAGE India, 2021.	
<b>Books for Reference</b>	1. Social Media Marketing: A Strategic Approach. Debra Zahay, Mary Lou Roberts, Cengage Learning, 2022 2. ChatGPT & Social Media Marketing. Ryan Turner .Kindle Edition, 2021	

### Teaching and learning methods

- Class Lecture
- Lab classes
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

### **Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Familiar with the elements of Digital and Social media marketing	<b>K1</b>
<b>CO 2</b>	Gain knowledge on digital marketing mix	<b>K2</b>
<b>CO 3</b>	Specialized in preparing social media management	<b>K3</b>
<b>CO 4</b>	Prepare students for marketing in social media	<b>K3</b>
<b>CO 5</b>	make effective Social analytics	<b>K4</b>

### **Mapping Course Outcome**

<b>Objectives</b>	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>Outcome</b>														
CO1				3		3		3						09
CO2					3				3		2			08
CO3		3	2							2	2			09
CO4				2	3			3			3			11
CO5				1	2			2	3		3			11
<b>Grand Total of Cos with PSOs and POs</b>														<b>48</b>
<b>Mean Value of Cos with PSOs and POs=48/19</b>														<b>2.52</b>

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			2.52
Observation	<b>Cos of Digital and Social Media Marketing –Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) –KARUMATHUR**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

**Internship**

Class	: III BBA	Part	: IV
Semester	: V Semester	Hours	:-
Subject Code	: 22UINT15	Credit	: 01

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**Course Objectives:**

1. Create awareness of experience-based learning processes outside an institutional structure, and to develop confidence and initiative in learning from experience
2. Develop ability to work with entrepreneur through observation and interview
3. Form skill and understanding about the basic business strategies involved in local business market and to imbibe entrepreneurial skills

**Course Outcomes**

1. Gain confidence from experience-based learning
2. Develop ability to work with entrepreneur through observation and interviews
3. Understand basic business strategies involved in local business market.

**Description:**

Internship is an integral part of the curriculum for successful completion of the BBA programme. It is designated for III year BBA students to improve their observing and analytical skills and provide them with practical experience. The essence of the Internship is to help students gain skills in both quantitative and qualitative techniques such as observation and note-taking, participant-observation, formal and informal interviewing, surveys, and report writing skills. This will help students to imbibe entrepreneurial skills and to develop better perceptions on local culture and business strategies.

**Supervision, dates and Duration of the Institutional Training**

Every student has to undergo field meet an entrepreneur during the sixth semester and they will have to conduct an interview about their business and submit their report within a period of one month in the department. Each student will be attached to one faculty guide, with whom he/she shall be in continuous touch during the Internship period. The faculty guide will be required to evaluate the report for 25 marks and the corresponding entrepreneur will evaluate the his performance and report for 25 marks. The evaluation of the remaining 50 marks shall be made by the department during viva voce on the basis of the students' performance.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-  
625514 DEPARTMENT OF BUSINESSADMINISTRATION  
STRESS MANAGEMENT**

Title(SLC)	<b>Stress Management</b>	Course Code	22UBASL5
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	-
Semester	<b>V</b>	Credit	<b>03</b>
Course Educational Objectives(CEO)	1. Introduce the fundamentals of Stress 2. Explore sources and causes of stress 3. Impart knowledge on types of stress 4. Inculcate methods to identify stress 5. Discuss management techniques of stress		
<b>Unit</b>	<b>Content</b>	<b>No.of Hours</b>	
I	<b>Meaning and nature of stress:</b> Difference between eustress and distress; Frustration, conflict and pressure; Meaning of stressors; common stressors at work place: Stressors unique to age and gender.	-	
II	<b>Sources and causes of stress</b> Sources of Stress- Across the Lifespan; College and Occupational Stress. Consequences of stress; Physiological and psychological changes associated with the stress response. Stress and Memory; Stress and Other Cognitive Variables; Stressful environmental conditions on performance	-	
III	<b>Types of stress</b> Types – Acute stress, Chronic stress, Internal irritations, External exasperations.	-	
IV	<b>Strategies of Stress Management:</b> Prevention of stress Challenging Stressful Thinking; Problem Solving; Emotional and cognitive coping styles: Strategies of Synthesis and Prevention: Resilience and Stress; Optimal functioning; Making changes last; Small changes and large rewards.	-	
V	<b>Managing stress</b> Care of the Self: Nutrition and Other Lifestyle Issues: Stress reduction practices: Time management; Exercise; Relaxation techniques; yoga; meditation.	-	

<b>Books for Study</b>	1. Pestonjee, D.M.(2009).Stress and Coping.(2nd) New Delhi: Sage Publication. 2. Cartwright,S and Cooper,C.L.(2012):Managing Workplace Stress, New Delhi: Sage
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**Teaching and learning methods**

- ☐ Class Lecture
- ☐ Video Clippings
- ☐ Group Discussion
- ☐ ICT (Information communication Technology)

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Gain knowledge on fundamentals of Stress	<b>K1</b>
<b>CO 2</b>	Familiarize the sources and causes of stress	<b>K2</b>
<b>CO 3</b>	Gain knowledge on types of stress	<b>K1</b>
<b>CO 4</b>	Understand methods of identifying stress	<b>K1</b>
<b>CO 5</b>	Manage stress	<b>K5</b>

**Mapping Course Outcome**

<b>Objectives</b>	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>Outcome</b>														
CO1		3				3	3	3	3	3	3			21
CO2		3				3	3	3	3	3	3			21
CO3		3				3	3	3	3	3	3			21
CO4		3				3	3	3	3	3	3			21
CO5		3				3	3	3	3	3	3			21
Grand Total of Cos with PSOs and POs														105
Mean Value of Cos with PSOs and POs=105/35														3

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COs With PSOs and POs			3
Observation	<b>Cos of Stress Management – Strongly related with PSOs and POs</b>		

**K1=Remember, K2 =Understand, K3=Apply, K4=Analyze, K5=Evaluate, K6=Create**

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

Title (Core – 16)	<b>MODERN SALES MANAGEMENT</b>	Course Code	22UBAD66
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	<b>75</b>
Semester	<b>VI</b>	Credit	<b>05</b>
Cognitive Level	<b>K-1 Knowledge</b> <b>K-2 Understanding</b> <b>K-3 Application</b> <b>K-4 Analysis</b> <b>K-5 Evaluation</b>		
Course Educational Objectives(CEO)	1. Introduce the fundamentals of Sales management 2. Describe the functions of Sales manager 3. Impart Knowledge on Sales force management 4. Inculcate knowledge on Distribution management 5. Discuss the recent trends in Sales management		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Introduction to sales management</b> Sales management – Definition – Objectives and Scope – Sales Organization, Types of sales Organization structure, - Sales Forecasting, Importance, Methods of sales Forecasting.	15	
II	<b>Functions of Sales Manager</b> Process of selling- Prospecting - Approach, Methods of approaching prospects, - Presentation - Handling objections - Closing the sales, Methods of closing sales.	15	
III	<b>Sales Force Management</b> Recruitment and Selection of Sales force – Training and Development– Sales force Motivation - Compensation - Sales territories - Sales Quotas- Types of Quotas –Sales Man’s	15	

	Reports, Types of reports – Ethics of Sales person	
IV	<b>Distribution Management</b> Distribution Channel – An Introduction – Strategy – Rural Distribution Channel – Designing Customer Oriented Channel – Logistics Planning – Channel Information Systems.	15
V	<b>Recent Trends</b> Social Selling – Customer Relationship management – Personalization – Sales Automation – AI Adoption	15
<b>Books for Study</b>	1. Edward W. Cundiff & Richard R. Still, Sales Management, Prentice - Hall, New York, 2021. 2. Panda K. Tapan & Sunil Sahadev, Sales & Distribution Management, Oxford University Press, New Delhi 2020	
<b>Books for Reference</b>	1. Cron, Sales Management Concepts And Cases, John Wiley, New Jersey, 2019. 2. <u>Pradip Mallik</u> , Sales Management, Oxford University Press, New Delhi, 2019.	

### Teaching and learning methods

- Class Lecture
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

### **Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Comprehend the fundamentals of sales management	<b>K1</b>
<b>CO 2</b>	Demonstrate an understanding of the various functions of a sales manager and how they contribute to the success of a sales team and organization.	<b>K3</b>
<b>CO 3</b>	Knowledge and skills related to sales force management, including recruitment, training, motivation, and performance evaluation.	<b>K2</b>
<b>CO 4</b>	Develop an understanding of distribution management,	<b>K4</b>
<b>CO 5</b>	Stay abreast of recent trends in sales management	<b>K2</b>

### Mapping Course Outcome

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs& POs
Outcome														
CO1	3	3				3	3							12
CO2	2					2								04
CO3			3						3					06
CO4				1	3				2			2		08
CO5				2							2			04
Grand Total of COs with PSOs and POs														34
Mean Value of COs with PSOs and POs=34/14														2.42

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			2.42
Observation	<b>Cos of Modern Sales Management –Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**

Title (Core-17)	<b>EXPORT DOCUMENTATION &amp; PROCEDURE</b>	Course Code	22UBAD76
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	<b>75</b>
Semester	<b>VI</b>	Credit	<b>04</b>
Course Educational Objectives(CEO)	1. Introduce the basic principles and fundamentals of Export and Import 2. Illustrate the various agencies in Foreign trade 3. Analyze the documentation procedures in export 4. Exhibit the procedures for Import Liberation 5. Explore the various financial institutions for export		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Import and Export Trade</b> Introduction of Import and Export Trade – Export and Import of major commodities in India – Export Promotion Councils – Role of Director General of Foreign Trade – General objectives of Exim Policy.	15	
II	<b>Foreign Trade Agency</b> Indian Institute of Foreign Trade-Trade Development Authority-State Trading Corporation.	15	
III	<b>Documentation for export</b> Terms of trade and Shipping Documents – Related to Export bills- Marine Insurance policy - Invoices and certificates and other documents.	15	
IV	<b>Import Liberalization</b> Import Liberation - Introduction of open general license – EPCG (Export Promotion Capital Goods) Scheme – DEPB (Duty Entitlement Passbook Scheme) – SIL (Special Import License) – Export	15	
V	<b>Financial Institution for export</b> Financial institutions and export trade, payment exports. Duty Draw Back credit scheme, Buyers credit scheme – Bid Bond and Quarantine against exports, factoring and forfeiting. EXIM Bank of India. Lending programs, line of credits, differed payments exports.	15	

**Text Book**

1. Ramagopal C., Export Import Procedure and Documentation and Logistics, New Age International Publishers, Chennai, 2019.

**Reference books**

1. Francis Cherunilam, International trade and Export management, Himalaya Publishing House, Chennai, 2019.
2. Jeevanandam. C. Foreign Exchange & Risk Management, Sultan Chand & Sons, New Delhi, 2020.
3. Neelam Arora, Export Marketing Himalaya Publishing House, New Delhi, 2019

**Teaching and learning methods**

- ☐ Class Lecture
- ☐ Video Clippings
- ☐ Group Discussion
- ☐ ICT (Information communication Technology)

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Define basic knowledge on Export and Import	<b>K3</b>
<b>CO 2</b>	Identify and describe the various agencies involved in foreign trade and their roles.	<b>K3</b>
<b>CO 3</b>	Analyze documentation procedures essential for export transactions.	<b>K4</b>
<b>CO 4</b>	Understand the procedures and regulations involved in import liberation.	<b>K2</b>
<b>CO 5</b>	Explore different financial institutions and mechanisms available for export.	<b>K2</b>

**K1=Remember, K2 =Understand, K3=Apply, K4=Analyze, K5=Evaluate, K6=Create**

**Mapping Course Outcome**

Objectives	PSO	PSO	PSO	PSO	PSO	PO	Sum of Cos with PSOs & POs							
	1	2	3	4	5	1	2	3	4	5	6	7	8	
CO1	3	3	3	3		3		3			3			21
CO2	3		3	3		3	3	3			3			21
CO3	3	3	3					3						12
CO4	3			3		3	3	3						15
CO5	3	3		3		3	3	3			3			21
Grand Total of Cos with PSOs and POs														90
Mean Value of Cos with PSOs and POs=90/30														3

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			3
Observation	<b>Cos of Export Documentation and Procedure –Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-  
625514 DEPARTMENT OF BUSINESS ADMINISTRATION  
ADVERTISING MANAGEMENT**

Title(Core-18)	<b>ADVERTISING MANAGEMENT</b>	Course Code	22UBAD86
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	<b>75</b>
Semester	<b>VI</b>	Credit	<b>04</b>
Course Educational Objectives(CEO)	1. Impart knowledge on the basic concepts of advertising. 2. Exhibit knowledge on how advertising influences the consumers. 3. Understand the strategy planning and development process. 4. Explore the way to select the right media 5. Familiarize the functioning of advertising Agencies		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>UNIT I–Introduction to Advertising</b> Advertising meaning-Roles & Functions, Evolution, Benefits, The key Players, Types, Advertising Ethics, classification of Advertising.	15	
II	<b>UNIT II–Planning &amp; Strategy</b> How advertising works, The Effects behind advertising Effectiveness- The Facet model. The Consumer Audience-cultural, social, behaviour and Psychological influence. The consumer decision process. Strategic Research- types, uses and Research methods used in advertising planning.	15	
III	<b>UNIT III– Strategic planning &amp; Advertising</b> Strategic planning, advertising objectives and strategic objectives, Segmenting and Targeting, positioning strategy Advertising budget– importance-Budgetary process.	15	
IV	<b>UNIT IV–Advertising Media</b> Advertising media- Type- print, broadcast, interactive and alternative media- advantages and disadvantages – Media planning and Buying- The components of a media plan, Media strategies, media planning changes and challenges.	15	

V	<b>UNIT V–Advertising Agencies</b> Advertising agency-functions – Selecting an advertising agency – Agency compensation – Creative strategy planning and development–Creative process and advertising– Advertising layout–Current issues in advertising.	15
<b>Books for Study</b>	<b>Text Book:</b> 1.Wells Moriarty Burnet Advertising Principles and Practice, Pearson Seventh Edition	
<b>Books for Reference</b>	<b>References:</b> 1. S.A. Chunawalla K.J.Kumar K.C. sethia Advertising Theory & Practice Himalaya Publishing House. 2016 2. Batra, Myres, Aaker, Advertising Management, Prentice Hall Publications, New Delhi, 2005. 3. Chunnawalla, Kumar, Sethiam Subramanian, 4 <sup>th</sup> Edition, Advertising Theory and Practice, Himalaya Publication, New Delhi, 1996. 4. Rathoor, Advertising Management, Himalaya Publication House, Mumbai, 1996.	

### Teaching and learning methods

- ❑ Class Lecture
- ❑ Video Clippings
- ❑ Interact
- ❑ ICT(Information communication Technology)

### **Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Acquire knowledge on basic concepts of Advertising	<b>K2</b>
<b>CO 2</b>	Gain knowledge on consumer decision making process	<b>K1</b>
<b>CO 3</b>	Specialized in ways to strategy planning	<b>K3</b>
<b>CO 4</b>	Gain knowledge on right media selection	<b>K2</b>
<b>CO 5</b>	Make effective selection of advertising agency.	<b>K2</b>

### Mapping Course Outcome

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of Cos with PSOs & POs
Outcome														
CO1	3		2			3			2		2			12
CO2		3					1		3					7
CO3	3		3						3		3			12
CO4	3	3				3			3		2			14
CO5			2		3		3		3					11
Grand Total of Cos with PSOs and POs														56
Mean Value of Cos with PSOs and POs=56/21														2.6

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COs With PSOs and POs			2.6
Observation	<b>Cos of Advertising Theory &amp; Practices – Strongly related with PSOs And POs</b>		

**K1=Remember, K2 =Understand, K3=Apply, K4=Analyze, K5=Evaluate, K6=Create**

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

Title (Core – 19)	<b>BUSINESS POLICY &amp; STRATEGIC MANAGEMENT</b>	Course Code	22UBAD96
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	75
Semester	<b>VI</b>	Credit	04
Course Educational Objectives(CEO)	<ol style="list-style-type: none"> <li>1. To impart knowledge about the basic concept of strategy and Policy among students</li> <li>2. To understand the various types of strategic formulation</li> <li>3. Intensified competition among domestic private and public companies and multinational companies.</li> <li>4. Interpret the business level strategies.</li> <li>5. To impart the knowledge on strategic evaluation and control.</li> </ol>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Introduction to Strategic Management</b> Introduction to Business policy– Evolution of strategic planning – Strategy vs Policy – Issues faced in strategic planning	15	
II	<b>Strategy Formulation and Environmental Appraisal</b> Environmental Analysis and diagnosis – Concept of environment and its components – Environment scanning and appraisal – Organizational appraisal – SWOT analysis – Internal Analysis – External analysis – Michael Porter 5 Force Industry Analysis – Key factor Rating.	15	
III	<b>Corporate Level Strategy</b> Corporate Level strategies – Expansion, Stability, Retrenchment – Concentration Strategies - Integration Strategies – Diversification – Conglomerate – Stability Strategies – Retrenchment strategies- Turnaround-Divestment-Liquidation	15	
IV	<b>Business Level Strategy</b> Generic competitive strategies – Cost leadership, differentiation, Focus - Value Chain Analysis – Bench Marking - Grand strategies -BCG approach - Functional Strategies-Nature-Need-Development	15	
V	<b>Strategic Evaluation &amp; Control</b> Measuring Performance, Balanced Score Card,	15	

	Contingency Planning, Strategy auditing, Difference between strategic control and Operational control.	
<b>Books for Study</b>	1. Azhar Kazmi, Strategic Management and Business Policy, (McGraw-Hill Education (India) Private Limited, New Delhi, 2021 2. Francis Cherunilam, Business Policy and Strategic Management, Text and Cases, Himalaya Publishing House, New Delhi, 2020.	
<b>Books for Reference</b>	1. Subba Rao, Business Policy and Strategic Management, Text and Cases, Himalaya Publishing House, New Delhi, 2018. 2. R.M. Srivastava & Shubhra Verma, Strategic Management, Concepts, Skills and Practices, PHI Learning Private Ltd, New Delhi, 2019.	

### Teaching and learning methods

- Class Lecture
- Video Clippings
- Interact
- ICT (Information communication Technology)

### **Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Demonstrate a clear understanding of the fundamental concepts of strategy and policy, including their definitions, importance, and relationship within organizational contexts.	<b>K1</b>
<b>CO 2</b>	Identify and differentiate between various types of strategic formulation approaches	<b>K2</b>
<b>CO 3</b>	Analyze the dynamics of intensified competition among domestic private and public companies as well as multinational corporations	<b>K3</b>
<b>CO 4</b>	Evaluate business-level strategies employed by organizations to gain competitive advantage in their respective industries	<b>K4</b>
<b>CO 5</b>	Apply knowledge of strategic evaluation and control mechanisms to assess the performance of organizational strategies	<b>K5</b>

### **Mapping Course Outcome**

<b>Objectives</b>	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of Cos with PSOs & POs
<b>Outcome</b>														
CO1	3					3								06
CO2			3							3				06

CO3		3				3	3	2		3	3			17
CO4	3	3	3			3	3			3	3			21
CO5			3								3			06
Grand Total of Cos with PSOs and POs													56	
Mean Value of Cos with PSOs and POs=56/19													2.9	

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			2.9
Observation	<b>Cos of Business Policy &amp; Strategic Management –Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**

Class	: IIBBA	Part	: III Core-20
Semester	: VI Semester	Hours	: 60
Subject Code	: 22UBAT06	Credit	: 03

**Project**

**Course Objectives:**

1. To understand the practical aspects of the research process
2. To identify a problem at the firm level/industry level and undertake a research study, through a systematic research methodology.
3. To demonstrate an ability to draft a clear report

**Course Outcomes**

1. Gain research knowledge from experience-based learning
2. Develop ability to work with respondents during data collection
3. Specialized in drafting a clear report with findings and suggestions for the business problems

**Description:**

In the VI semester, the student has to avail 21 days for project data collection and analysis in consultation with the faculty guide. The report has to be submitted within three months of the commencement of VI semester.

Project report evaluation consists of report evaluation and the conduct of viva voce examination. Report evaluation (50 marks) will be undertaken by a faculty guide independently and, Viva voce examination (50 marks) will be conducted by the Head of the Department and the faculty guide together.

The students should undergo the following systematic research methodology

- Identification of research problem
- Collection of Review of literature
- Selection of the title of the research
- Identification of the statement of the problem
- List out the objectives of research
- Preparation of tools of research
- Data collection
- Data processing
- Preparation of report
- Submission of report

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**

Title (Core Elective – 2)	<b>Financial Accounting Package using Tally</b>	Course Code	22UBAE26 (A)
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	<b>60</b>
Semester	<b>VI</b>	Credit	<b>03</b>
Course Educational Objectives	<ol style="list-style-type: none"> <li>1. Introduce the basic concepts of Accounting and Principles</li> <li>2. Discuss about creation of companies</li> <li>3. Exhibit the methods of Groups and Ledger</li> <li>4. inculcate the methods of Voucher preparation</li> <li>5. Prepare GST and Reports</li> </ol>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Introduction to Accounts:</b> Introduction to Accountancy – Rules of Accounting – Principles of Accounting- Journal – Ledger – Subsidiary Books – Artificial intelligence in Accounting	12	
II	<b>Tally - Introduction</b> Introduction – difference between manual accounting and mechanized accounting – types of accounting packages - tally fundamental – key components of tally – creation of companies	12	
III	<b>F11 Features – F12 Features</b> Maintaining company data – basic company defaults – F11 features – F12 Features – configurations – groups – Types - Ledgers	12	
IV	<b>Preparation of Voucher</b> Configuring vouchers - Creation of vouchers – Pre-defined Vouchers – Contra- Purchase – Sales – Payment – Receipt – Journals – Memo – Optional vouchers – Reversing journals – Postdates vouchers – Pure inventory vouchers – Receipt note voucher – Rejections in voucher – Rejections out voucher – Stock journal voucher – Physical stock voucher –Display, Alteration, Deletion – Modifying vouchers –	12	

	buttons on the button panel.	
V	<b>GST &amp; Generating Reports</b> GST – Reports Generation - Trial Balance – Balance Sheet – Profit and Loss account – Stock summary – Ratio analysis – Display menu – Daybook – Cash flow and funds flow – Bank Reconciliation Statement – Internet Capabilities – E-Mail – Web Publishing – Keyboard Shortcuts	12
<b>Books for Study</b>	1. Tally Education Pvt Ltd - 2018 - Tally. ERP 9 with GST– Publications	
<b>Books for Reference</b>	1. Asok K. Nandhani – 2018 – Tally ERP Training Guide – SPS Publications 2. Er. Soumya Rajan Behera - 2014 - Tally. ERP - 3 <sup>rd</sup> Edition - BK Publications	

### Teaching and learning methods

- Class Lecture
- Lab Classes
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

### **Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Demonstrate a foundational understanding of accounting principles and concepts,	<b>K2</b>
<b>CO 2</b>	Understand the process and requirements involved in the creation of companies	<b>K1</b>
<b>CO 3</b>	Utilize Tally software to perform grouping and ledger maintenance effectively	<b>K1</b>
<b>CO 4</b>	Apply the methods and features of Tally software for voucher preparation, including creating, recording, and managing various types of vouchers	<b>K3</b>
<b>CO 5</b>	Utilize Tally software to prepare GST-compliant invoices, manage GST transactions, and generate reports required for GST compliance and reporting purposes	<b>K2</b>

### Mapping Course Outcome

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of Cos with PSOs & POs
Outcome														
CO1				3		3		3						09
CO2					3				3		2			08
CO3		3	2							2	2			09
CO4				2	3			3			3			11
CO5				1	2			2	3		3			11
Grand Total of Cos with PSOs and POs														48
Mean Value of Cos with PSOs and POs=48/19														2.52

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COS With PSOs and POs			2.52
Observation	<b>Cos of Financial Accounting Package using Tally –Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**  
**BUSINESS ETHICS**

Title Core Elective 2	<b>BUSINESS ETHICS</b>	Course Code	22UBAE26 (B)
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	60
Semester	<b>VI</b>	Credit	03
Course Educational Objectives(CEO)	1. To impart knowledge on ethics in business 2. To discuss the rights and duties of a business 3. Illustrate ethical decision making 4. Explain corporate social responsibilities 5. Analyze ethics in functional areas		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>INTRODUCTION TO ETHICS</b> Meaning and scope – principles of personal ethics – principles of professional ethics- values and ethics – business ethics – need for business ethics– reasons behind unethical behaviour Source of ethical conflicts, consequences of ethical behaviour – corporate governance ethics- code of conduct and ethics for managers	12	
II	<b>ETHICAL THEORIES</b> Deontological–teleological–Rights and Duties–justice And fairness	12	
III	<b>ETHICAL DECISION MAKING</b> Moral reasoning–Kohlberg’s Moral Development–Ethical Dilemma -Values	12	
IV	<b>CORPORATE SOCIAL RESPONSIBILITY</b> Basics and approaches of CSR–Social Accountability Standards–Corporate Governance	12	
V	<b>ETHICS IN FUNCTIONAL AREAS</b> Finance– Marketing– HR/Work Place Diversity– Intellectual Property Rights – IT –Production and Environment	12	
<b>Books for Study</b>	1.Velasquez,M.G.(12011).Business Ethics–Concepts and Cases(6ed) New Delhi: Prentice Hall of India(P)Ltd		

<b>Books for Reference</b>	1. Ferrell, C. & Paquol, F. J. (2005). Business Ethics (6ed). New Delhi: Biztantra Publications. 2. Albuquerque, D. (2013). Business Ethics. (5ed). New Delhi: Oxford University Press.
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**Teaching and learning methods**

- ☐ Class Lecture
- ☐ Video Clippings
- ☐ Interact
- ☐ ICT (Information communication Technology)

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Retrieve the meaning, scope, functions of ethics in business	<b>K1</b>
<b>CO 2</b>	Apply the ethical justice and fairness in business	<b>K3</b>
<b>CO 3</b>	Apply ethical decision making	<b>K3</b>
<b>CO 4</b>	Describe corporate social responsibilities	<b>K2</b>
<b>CO 5</b>	Evaluate ethics in functional areas	<b>K5</b>

**Mapping Course Outcome**

Objectives Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of Cos with PSOs & POs
	CO1	3		2	3		3	2			3			
CO2		3	3						3	3				12
CO3	3	3			3		2		3	3	3			20
CO4	3			3					3	3				12
CO5		3		3	2			3		3	2			16
Grand Total of Cos with PSOs and POs														76
Mean Value of Cos with PSOs and POs = 76/27														2.8

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs With PSOs and POs			2.8
Observation	<b>Cos of Business Ethics – Strongly related with PSOs and POs</b>		

**K1=Remember, K2 =Understand, K3=Apply, K4=Analyze, K5=Evaluate, K6=Create**

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

**CUSTOMER RELATIONSHIP MANAGEMENT**

Title (Core Elective – 2)	<b>CUSTOMER RELATIONSHIP MANAGEMENT</b>	Course Code	22UBAE26 (C)
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	<b>60</b>
Semester	<b>VI</b>	Credit	<b>03</b>
Course Educational Objectives	<ol style="list-style-type: none"> <li>1. To be aware of the nuances of customer relationship</li> <li>2. To analyze the CRM link with the other aspects of marketing</li> <li>3. To impart the basic knowledge of the Role of CRM in increasing the sales of the company</li> <li>4. To make the students aware of the different CRM models in service industry</li> <li>5. To make the students aware and analyze the different issues in CRM</li> </ol>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Evolution of Customer Relationship</b> CRM- Definition, Emergence of CRM Practice, Factors responsible for CRM growth, CRM process, framework of CRM, Benefits of CRM, Types of CRM, Scope of CRM, Customer Profitability, Features Trends in CRM , CRM and Cost-Benefit Analysis, CRM and Relationship Marketing.	12	
II	<b>CRM Concepts</b> Customer Value, Customer Expectation, Customer Satisfaction, Customer Centricity, Customer Acquisition, Customer Retention, Customer Loyalty, Customer Lifetime Value. Customer Experience Management, Customer Profitability, Enterprise Marketing Management, Customer Satisfaction Measurements, Web based Customer Support.	12	
III	<b>Planning for CRM</b> Steps in Planning-Building Customer Centricity, Setting CRM Objectives, Defining	12	

	Data Requirements, Planning Desired Outputs, Relevant issues while planning the Outputs, Elements of CRM plan, CRM Strategy: The Strategy Development Process, Customer Strategy Grid.	
IV	<b>CRM and Marketing Strategy</b> CRM Marketing Initiatives, Sales Force Automation, Campaign Management, Call Centres. Practice of CRM: CRM in Consumer Markets, CRM in Services Sector, CRM in Mass Markets, CRM in Manufacturing Sector.	12
V	<b>CRM Planning and Implementation</b> Issues and Problems in implementing CRM, Information Technology tools in CRM, Challenges of CRM Implementation. CRM Implementation Roadmap, Road Map (RM) Performance: Measuring CRM performance, CRM Metrics.	12
<b>Books for Study</b>	1. Francis Buttle, Stan Maklan, Customer Relationship Management: Concepts and Technologies, 3rd edition, Routledge Publishers, 2020 2. Kumar, V., Reinartz, Werner Customer Relationship Management Concept, Strategy and Tools, 1st edition, Springer Texts, 2019	
<b>Books for Reference</b>	1. JagdishN.Sheth, AtulParvatiyar&G.Shainesh, "Customer Relationship Management", Emerging Concepts, Tools and Application",TMH, 2018,. 2. Dilip Soman& Sara N-Marandi," Managing Customer Value" 1st edition, Cambridge, 2019. 3. Alok Kumar Rai, "Customer Relationship Management: Concepts and Cases", PHI, 2019.	

### Teaching and learning methods

- Class Lecture
- Lab Classes
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

## Course Outcome (CO)

On successful completion of the course, the student able to

<b>CO 1</b>	Familiar with the nuances of customer relationship	<b>K2</b>
<b>CO 2</b>	Gain knowledge on CRM link with the other aspects of marketing	<b>K1</b>
<b>CO 3</b>	Gain knowledge on Role of CRM in increasing the sales of the company	<b>K1</b>
<b>CO 4</b>	Specialized in different CRM models in service industry	<b>K3</b>
<b>CO 5</b>	Familiar with Analysing the different issues in CRM	<b>K2</b>

## Mapping Course Outcome

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>Outcome</b>														
CO1	3		2	3		3	2			3				16
CO2		3	3						3	3				12
CO3	3	3			3		2		3	3	3			20
CO4	3			3					3	3				12
CO5		3		3	2			3		3	2			16
Grand Total of Cos with PSOs and POs														76
Mean Value of Cos with PSOs and POs=76/27														2.8

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COs With PSOs and POs			2.8
Observation	<b>Cos of Customer Relationship management –Strongly related with PSOs and POs</b>		

**K1=Remember, K2 =Understand, K3=Apply,K4=Analyze,K5=Evaluate, K6=Create**

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**  
**BUSINESS ETIQUETTE**

Title SLC	<b>BUSINESS ETIQUETTE</b>	Course Code	22UBASL6
Class	<b>III BUSINESS ADMINISTRATION</b>	Hours	-
Semester	<b>VI</b>	Credit	03
Course Educational Objectives(CEO)	<ol style="list-style-type: none"> <li>1. To impart knowledge on ethics in business</li> <li>2. To discuss the rights and duties of a business</li> <li>3. Illustrate ethical decision making</li> <li>4. Explain corporate social responsibilities</li> <li>5. Analyze ethics in functional areas</li> </ol>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Introduction to Ethics</b> Meaning and scope – principles of personal ethics – principles of professional ethics- values and ethics – business ethics – need for business ethics– reasons behind unethical behaviour Source of ethical conflicts, consequences of ethical behaviour – corporate governance ethics- code of conduct and ethics for managers	-	
II	<b>ETHICAL THEORIES</b> Deontological–teleological–Rights and Duties–justice and fairness	-	
III	<b>ETHICAL DECISION MAKING</b> Moral reasoning–Kohlberg’s Moral Development–Ethical Dilemma -Values	-	
IV	<b>CORPORATE SOCIAL RESPONSIBILITY</b> Basics And approaches of CSR–Social Accountability Standards–Corporate Governance	-	
V	<b>ETHICS IN FUNCTIONAL AREAS</b> Finance–Marketing–HR/Work Place Diversity–Intellectual Property Rights–IT–Production and Environment	-	
<b>Books for Study</b>	1. Velasquez, M.G. (2011). Business Ethics–Concepts and Cases (6ed) New Delhi: Prentice Hall of India (P) Ltd		
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Ferrell, O.C. &amp; Paqu. F.J. (2005). Business Ethics (6ed). New Delhi: Biztantra Publications.</li> <li>2. Albuquerque, D. (2013). Business Ethics. (5ed). New Delhi: Oxford University Press.</li> </ol>		

### Teaching and learning methods

- ☐ Class Lecture
- ☐ Video Clippings
- ☐ Interact
- ☐ ICT(Information communication Technology)

### Course Outcome (CO)

On successful completion of the course, the student able to

<b>CO 1</b>	Retrieve the meaning, scope, functions of ethics in business	<b>K1</b>
<b>CO 2</b>	Apply the ethical justice and fairness in business	<b>K3</b>
<b>CO 3</b>	Apply ethical decision making	<b>K3</b>
<b>CO 4</b>	Describe corporate social responsibilities	<b>K2</b>
<b>CO 5</b>	Evaluate ethics in functional areas	<b>K5</b>

### Mapping Course Outcome

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of Cos with PSOs & POs
CO1	3		2	3		3	2			3				16
CO2		3	3						3	3				12
CO3	3	3			3		2		3	3	3			20
CO4	3			3					3	3				12
CO5		3		3	2			3		3	2			16
Grand Total of Cos with PSOs and POs														76
Mean Value of Cos with PSOs and POs=76/27														2.8

\*:S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COs With PSOs and POs			2.8
Observation	<b>Cos of Business Ethics –Strongly related with PSOs and POs</b>		

**K1=Remember,K2 =Understand,K3=Apply,K4=Analyze,K5=Evaluate, K6=Create**

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

**CBCS STRUCTURE for BBA**

<b>I SEMESTER</b>				
<b>Part</b>	<b>Sub.Code</b>	<b>PAPER</b>	<b>Hrs</b>	<b>Cr</b>
I	22UTAL11/ 22UHNL11/ 22USNL11	Tamil Hindi French	05	04
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream – B	05	04
III	22UBAC11	Core – 1 Management Thought and Process	06	05
	22UBAC21	Core – 2 Office Administration	06	05
	22UBAA11	<b>Allied – 1</b> Accounting for Managers	<b>05</b>	<b>04</b>
IV	22UFCE11	Foundation Course – Personality Development	01	01
	19UCSH12	Communication Skills	01	-
	22USSI16	Soft Skills	01	-
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NCC/NSS /PHY.EDN./YRC/ ROTARACT/AICUF/Nature Club	-	-
	22UBRC11	Bridge Course	-	01
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>II SEMESTER</b>				
I	22UTAL22/ 22UHNL22/ 22USNL22	Tamil Hindi French	05	04
II	22UENA22/ 22UENA22	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream – B	05	04
	22UBAC32	Core – 3 Business Environmental Management	06	05
	22UBAC42	Core – 4 Entrepreneurship Development	06	04
	22UBAA22	<b>Allied – 2</b> Introduction to Statistics	05	04
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	01	01
	22UCSH12	Communication Skills	01	1
	22USSI16	Soft Skills	01	-
V	22UNCC/NSS/ PHY.EDU./ YRC/ROT/ACF/ NCB12	Extension Activities NCC/NSS/PHY.EDN./ YRC/ROTARACT/AICUF/Nature Club	-	01
		<b>Total</b>	<b>30</b>	<b>24</b>

III SEMESTER				
	22UTAL33 22UHNL33 22USNL33	Tamil Hindi French	06	04
III	22UBAC53	Core – 5 Organisational Behaviour	06	05
	22UBAC73	Core – 6 Principles of Marketing	05	04
	22UBAA33	<b>Allied – 3 Business Mathematics</b>	<b>05</b>	<b>04</b>
IV	22UBAN13	<b>(To choose any 1 out of 3)</b> Basic Tamil/Advanced Tamil/Non-major Elective – 1.Introduction to Marketing Management 2. Introduction to Organisational Behaviour 3. Introduction to Tourism Management	03	02
	22UBAS13	<b>(To choose any 1 out of 3)</b> Skill Based Elective – 1 1. Executive Communication – 1 2. Time Management 3. Creativity and Innovation Management	03	02
	22UFCE33	F C – Environmental Studies	01	01
V	22UNCC/NSS/ PHY.EDU./ YRC/ROT/ACF/ NCB24	Extension Activities NCC /NSS /PHY.EDN. / YRC/ROTARACT / AICUF / NATURE CLUB	--	--
	22UARE14	ARISE	--	--
	22USSI16	Soft Skills	01	-
		<b>Total</b>	<b>30</b>	<b>22</b>
IV SEMESTER				
	22UTAL44 22UHNL44 22USNL33	Tamil Hindi French	06	04
III	22UBAC84	Core - 7 Human Resource Management	06	05
	22UBAC94	Core – 8 Managerial Economics	06	04
	22UBAA44	<b>Allied – 4 Operations Research</b>	05	04
IV	22UBAN24	<b>(To choose any 1 out of 3)</b> Basic Tamil/Advanced Tamil/Non-Major Elective – 1. Essentials of Leadership 2. Introduction to Rural Marketing 3. E-Business	03	02

	22UBAS24	<b>(To choose any 1 out of 3)</b> <b>Skill Based Elective 2 –</b> 1. Executive Communication – 2 2. Digital Marketing 3. Business Case Analysis	03	02
	22UFCH44	F C –Religious Literacy and Peace Ethics	01	01
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/ NCB24	Extension Activities NCC /NSS/Phy.Edn. / YRC/ROTARACT / AICUF / Nature Club	-	01
	22UARE14	ARISE	-	01
	22USSI16	Soft Skills	01	-
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>V SEMESTER</b>				
III	22UBAD15	Core - 09 Introductions to Operations Management	06	05
	22UBAD25	Core - 10 Services Marketing	05	05
	22UBAD35	Core - 11 Business Research Methods	05	04
	22UBAD45	Core - 12 Financial Management	05	03
	22UBAD55	Core - 13 Institutional Training & Viva – Voce	04	04
IV	22UBAE15	<b>(To choose any 1 out of 3)</b> Core Elective – 1 1. Computer Application in Business 2. ICT Skills 3. Digital and Social Media Marketing	04	03
	22UINT15	Internship on Industrial Exposure & Viva – Voce	-	1
	22USSI16	Soft Skills	01	-
		<b>Total</b>	<b>30</b>	<b>25</b>
<b>VI SEMESTER</b>				
III	22UBAD66	Core - 14 Company law and Secretarial Practice	05	05
	22UBAD76	Core - 15Export Documentation & Procedure	05	04
	22UBAD86	Core – 16 Advertising and Salesmanship	05	04
	22UBAD96	Core – 17 Business Policy & Strategic Management	05	04
	22UBAT06	Core – 18 Field Study Research Report & Viva – Voce	04	03
IV	22UBAE26	<b>(To choose any 1 out of 3)</b> Core Elective – 2 1. Financial Accounting Package using Tally 2. Business Ethics 3. Customer Relationship Management	04	03
	22USSI16	Soft Skills	01	02
		<b>Total</b>	<b>30</b>	<b>25</b>

Semester	I	II	III	IV	V	VI	Total
Credits	24	24	22	24	25	25	144
Part – I							08
Part – II							08
Part – III							
Core							86
Allied							16
Core Electives							06
Total							108
Part – IV							
Non-Major Electives							04
Skill based Electives							04
Value Education							04
Total							12
Part – V							02
Bridge Course							01
Arise							01
Communication Skill							01
Soft Skill							02
Internship							01

#### Self-Learning Courses – Additional Credits

Semester	Sub. Code	Title	Credit
III	22UBASL3	Body Language	03
IV	22UBASL4	Group Discussion	03
V	22UBASL5	Stress management	03
VI	22UBASL6	Business Etiquette	03

**DEPARTMENT OF BUSINESS ADMINISTRATION**  
**Corporate Skills for Executives**

Template for Course Syllabus

Title	<b>Corporate Skills for Executives</b>	Hours	30
Cognitive Level	<b>K-1</b> Knowledge <b>K-2</b> Understanding <b>K-3</b> Application		
Course Educational Objectives(CEO)	1. Students will be able to understand Soft skills 2. Students will acquire time management skills 3. Students will learn business etiquette		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Developing Soft Skills</b> Definitions and Types of Mindset, Learning Mindsets, Secrets of Developing Growth Mindsets, Importance of Time and Understanding Perceptions of Time, Using Time Efficiently, Understanding Procrastination, Overcoming Procrastination, Don't Say "Yes" to Make Others Happy	10	
II	<b>Empowering Interactions</b> Types of People, How to Say "No", Controlling Anger, Gaining Power from Positive Thinking-1, Gaining Power from Positive Thinking-2, Humour in Communication, Humour in the Workplace, Function of Humour in the Workplace, Money and Personality	10	
III	<b>Ethical Business Practices and Personal Growth</b> Ethics and Etiquette, Business Etiquette, Managing Mind and Memory, Improving Memory, Care for Environment, Managing Money	10	
<b>Books for Reference</b>	1. Dorch, Patricia. What Are Soft Skills? New York: Execu Dress Publisher, 2013. 2. Kamin, Maxine. Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. Washington, DC: Pfeiffer & Company, 2013. 3. Klaus, Peggy, Jane Rohman & Molly Hamaker. The Hard Truth about Soft Skills. London: HarperCollins E-books, 2007. 4. Petes S. J., Francis. Soft Skills and Professional Communication. New Delhi: Tata McGraw-Hill Education, 2011. 5. Stein, Steven J. & Howard E. Book. The EQ Edge: Emotional Intelligence and Your Success. Canada: Wiley & Sons, 2006.		

### Teaching and learning methods

- Online Lecture
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

### **Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Familiar with basic concepts in Soft skills	<b>K2</b>
<b>CO 2</b>	Make effective time management skills	<b>K3</b>
<b>CO 3</b>	Gain knowledge of business etiquette	<b>K2</b>

### **Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
<b>CO1</b>	3					3	2							<b>8</b>
<b>CO2</b>		2						3						<b>5</b>
<b>CO3</b>			3		3						3			<b>9</b>
<b>CO4</b>				1										<b>1</b>
<b>CO5</b>				3	3			2			1			<b>9</b>
<b>Grand total of COs with PSOs and POs</b>														<b>32</b>
<b>Mean Value of COs with PSOs and POs=32/13</b> (MV= Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs)														<b>2.46</b>

**Strong -3, Medium -2, Low -1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.46
Observation	COs of Corporate Skills for Executives– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**  
**TIME MANAGEMENT**

Template for Course Syllabus

Title	<b>TIME MANAGEMENT</b>	Hours	30
Cognitive Level	<b>K-1</b> Knowledge <b>K-2</b> Understanding <b>K-3</b> Application		
Course Educational Objectives(CEO)	1. Discuss elements of effective time management. 2. Inculcate steps to plan time management. 3. Discuss the importance of time management at workplace.		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Effective time management</b> Time Analysis-Keeping track of time using time log –analyzing time log –time spent/ invested patterns.		
II	<b>Planning for time management</b> Essential Steps in Using A Planner - Daily, weekly and long range planning –Using technology to save time.		
III	<b>Time management at workplace</b> Workplace and paper organizers - making meetings effective – Managing information overload.		
<b>Books for Reference</b>	1. Time Management for Busy People”, Roberta Roesch, McGraw-Hill Publishing, 2019. 2. Essence of Time Management: Principles and Practice”, Micheal Lab eof, Jaico Publishing House, 2016. 3. “Make Everything Count”, Robert W. Bly; Jaico Publication House, 2010.		

**Teaching and learning methods**

- Class Lecture
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Gain knowledge of Effective time management.	<b>K2</b>
<b>CO 2</b>	Gain knowledge on planning for time management.	<b>K2</b>
<b>CO 3</b>	Gain knowledge on Time management at work place	<b>K3</b>

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
<b>CO1</b>	3					3	2							<b>8</b>
<b>CO2</b>		2						3						<b>5</b>
<b>CO3</b>			3		3						3			<b>9</b>
<b>CO4</b>				1										<b>1</b>
<b>CO5</b>				3	3			2			1			<b>9</b>
<b>Grand total of COs with PSOs and POs</b>														<b>32</b>
<b>Mean Value of COs with PSOs and POs=32/13</b> (MV= Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs)														<b>2.46</b>

**Strong -3, Medium -2, Low -1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.46
Observation	COs of Time Management – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**

**Digital Marketing**

Template for Course Syllabus

Title	<b>Digital Marketing</b>	Hours	<b>30</b>
Cognitive Level	<b>K-1 Knowledge</b> <b>K-2 Application</b> <b>K-3 Analysis</b>		
Course Educational Objectives(CEO)	1. Introduce the basics of Digital marketing 2. Discuss the importance of understanding digital consumers 3. Analyze various strategies of digital marketing.		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Introduction to Digital Marketing</b> Introduction and significance of digital marketing – Traditional Vs Digital Marketing – Characteristics of Digital Marketing – Digital marketing strategy – Channels of digital marketing - Advantages and limitations of each channel	10	
II	<b>Understanding Digital Consumers</b> Consumer behavior in the digital age - Targeting and segmentation strategies in digital marketing	10	
III	<b>Digital Marketing Strategies</b> Developing a digital marketing strategy - Content marketing and social media strategy -Basics of SEO and PPC advertising – Online Advertising – Email Marketing – types of Email marketing – Advantages , Disadvantages	10	
<b>Books for Study</b>	1.Seema Gupta, Digital Marketing, McGraw Hill Noida, Uttar Pradesh 2. Puneet Bhatia Fundamentals of Digital Marketing Pearson Education India		
<b>Books for Reference</b>	1.Digital Marketing Essentials (Self-Learning Management Series) Vibrant Publishers, USA		

**Teaching and learning methods**

- Online Lecture
- Video Clippings
- Interact
- ICT (Information communication Technology)

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Gain knowledge on Digital Marketing	<b>K1</b>
<b>CO 2</b>	Know the consumer behavior in Digital Marketing	<b>K2</b>
<b>CO 3</b>	Reap the knowledge on strategies used in digital marketing	<b>K3</b>

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
<b>CO1</b>	3						3							<b>6</b>
<b>CO2</b>		3						3						<b>6</b>
<b>CO3</b>		3							3					<b>6</b>
<b>CO4</b>					3							3		<b>6</b>
<b>CO5</b>		3								3				<b>6</b>
<b>Grand total of COs with PSOs and POs</b>														<b>30</b>
<b>Mean Value of COs with PSOs and POs=30/10</b> (MV= Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs)														<b>3</b>

**Strong -3, Medium -2, Low -1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			3
Observation	COs of Digital Marketing– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514**  
**DEPARTMENT OF BUSINESS ADMINISTRATION**

**Outbound Training**

Template for Course Syllabus

Title (Core – 1)	<b>Outbound Training</b>	Hours	<b>30</b>
Cognitive Level	<b>K-1 Knowledge</b> <b>K-2 Understanding</b> <b>K-3 Application</b>		
Course Educational Objectives(CEO)	<ol style="list-style-type: none"> <li>1. Introduce the basics of Training and Development</li> <li>2. Discuss the various steps of training programs.</li> <li>3. Understand the applications of training methods.</li> </ol>		
Unit	Content	No. of Hours	
I	<b>Outbound Training</b> Meaning and Definition–Need for training– Importance of training, Objectives of Training, Responsibility for Training.	10	
II	<b>Steps in Training Programs</b> Training policy- leadership- personality- training period, - learning-role of AI in employee training.	10	
III	<b>Training methods:</b> On the Job; Vestibule Training -Workman -Supervisors- Demonstrations- Simulation- Apprenticeship. Off the Job: Lecturers- Conference-, Seminar-Team Discussion, Case Studies -Role playing,	10	
Books for Study	<ol style="list-style-type: none"> <li>1. P.SubbaRao;VSP, Rao, Human Resource Management, Konark Publishing Houses, Mumbai.</li> <li>2. SubasGurg&amp;SCJain, Managing Human Resource, Arihant Publications, Jaipur.</li> </ol>		
Books for Reference	<ol style="list-style-type: none"> <li>1. Bearddwell&amp;LenHoldmen, Human Resource Management, Macmillan Publisher.</li> </ol>		

**Teaching and learning methods**

- Online Lecture
- Video Clippings
- Interact
- ICT (Information communication Technology)

### Course Outcome (CO)

On successful completion of the course, the student able to

<b>CO 1</b>	Gain knowledge on Training and Development	<b>K1</b>
<b>CO 2</b>	Know the impact of training programs.	<b>K2</b>
<b>CO 3</b>	Familiarizing the Training methods.	<b>K2</b>

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
<b>CO1</b>	3						3							<b>6</b>
<b>CO2</b>		3						3						<b>6</b>
<b>CO3</b>		3							3					<b>6</b>
<b>CO4</b>					3							3		<b>6</b>
<b>CO5</b>		3								3				<b>6</b>
<b>Grand total of COs with PSOs and POs</b>														<b>30</b>
<b>Mean Value of COs with PSOs and POs=30/10</b> (MV= Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs)														<b>3</b>

**Strong -3, Medium -2, Low -1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			3
Observation	COs of Outbound Training – Strongly related with PSOs and POs		

**DEPARTMENT OF BUSINESS ADMINISTRATION**  
**Sports Administration and Management**

Template for Course Syllabus

Title	<b>Sports Administration and Management</b>	Hours	30
Cognitive Level	<b>K-1</b> Knowledge <b>K-2</b> Understanding <b>K-3</b> Application		
Course Educational Objectives(CEO)	1. Students will be able to understand Administration and Management 2. Students will acquire leadership qualities 3. Students will imbibe Public Relations in Physical Education field.		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Sports Management Essentials</b> Administration and Management, Elements and Phases of Management, Management in Physical Education and Sports, Schemes of Organization, tournament and Team Management, Tournament Management, Opening and Closing Ceremonies; Various Committees and their Responsibilities, Budget, maintenance of records and account keeping in Physical Education	10	
II	<b>Student Leadership and Public Relations</b> Student Leadership: Meaning, Elements, and Values/Significance, Selection, Training and Recognition of Student Leaders, Principles and Needs for a Public Relation Program in Physical Education	10	
III	<b>Public Relations and Interpersonal Dynamics</b> Public Relations in Physical Education, Techniques of Public Relation, Relation of the physical Education Teacher with the Students, Parents, Colleagues, Principal and Supervisor	10	
<b>Books for Reference</b>	1. BarricHoulihan, 2005: Sports and society, SAGE Publication, New Delhi. 2. Bucher,A.,Charles and Wuest Deborah A. 1998: Foundation Of Physical education and Sports, St. Louis Times Mirror, Mosby College Publishing. 3. Gupta,A.K.andNrang,Priyanka. 2006: Facts and foundation in Physical education and sports, Sports publication, G-6,23/23B EMCA House, Ansari Road, Darya Ganj New Delhi. 4. Mishra, Sharad. 2006: Reading in Physical education and sports, Sports Publication G-6, 23/23B EMCA House, Ansari Road, Darya Ganj New Delhi.		

### Teaching and learning methods

- Online Lecture
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

### **Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Familiar with basic concepts of Administration and Management	<b>K2</b>
<b>CO 2</b>	Adopt leadership qualities	<b>K3</b>
<b>CO 3</b>	Gain knowledge of Public Relations in Physical Education field.	<b>K2</b>

### **Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
<b>CO1</b>	3					3	2							<b>8</b>
<b>CO2</b>		2						3						<b>5</b>
<b>CO3</b>			3		3						3			<b>9</b>
<b>CO4</b>				1										<b>1</b>
<b>CO5</b>				3	3			2			1			<b>9</b>
<b>Grand total of COs with PSOs and POs</b>														<b>32</b>
<b>Mean Value of COs with PSOs and POs=32/13</b> (MV= Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs)														<b>2.46</b>

**Strong -3, Medium -2, Low -1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.46
Observation	COs of Sports Administration and Management– Strongly related with PSOs and POs		

**DEPARTMENT OF BUSINESS ADMINISTRATION  
ESSENTIALS OF LEADERSHIP**

Template for Course Syllabus

Title	<b>ESSENTIALS OF LEADERSHIP</b>	Hours	30
Course Educational Objectives(CEO)	1. Exhibit the concept leadership development 2. Discuss elements of building relationship 3. Inculcate current HR laws and strategic planning		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Leadership Development:</b> Introduction to Leadership: Importance of leadership, Roles of a Leader, Overview of Organizational Leadership Major Coursework and Issues in Organizational Leadership, Defining an Organization, Defining Leadership, Organizational Leadership, Differences between leadership and management in organizations Introduction to Leadership: Importance of leadership, Roles of a Leader, Overview of Organizational Leadership Major Coursework and Issues in Organizational Leadership, Defining an Organization, Defining Leadership, Organizational Leadership, Differences between leadership and management in organizations Introduction to Leadership: Importance of leadership, Roles of a Leader, Overview of Organizational Leadership Major Coursework and Issues in Organizational Leadership, Defining an Organization, Defining Leadership, Organizational Leadership, Differences between leadership and management in organizations	10	
II	<b>Building and Managing Relationships:</b> Develop relationships with direct reports, peers and senior leadership. Difference Between “Group” and “Team”, Stages of Team Development, Leading, Empowering, Following. Resolving Conflict and Negotiation: Levels of Conflict, Conflict Resolution.	10	
III	<b>HR and Legal Policies Strategic Planning:</b> Understand the current HR laws and policies that enhance effective leadership. Learn how to lead and manage change within your department and negotiate for resources.	10	

<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Bennis, W. (1994). On becoming a leader. (Rev. ed). Reading, MA: Perseus Books.</li> <li>2. Bryman, A. (1996). Leadership in organizations. In Clegg S. R., Hardy, C. and Nord, W. R. (Eds). Handbook of Organization Studies, pp.276-292. London: Sage.</li> <li>3. French, J. R. P. Jr. and Raven, B. (1962). The bases of social power. In D. Cartwright (Ed), Group Dynamics: Research and Theory (pp. 259-269). New York: Harper and Row</li> <li>4. Bennis, W. (2020). On becoming a leader. (Rev. ed). Reading, MA: Perseus Books.</li> <li>5. Bryman, A. (2023). Leadership in organizations. In Clegg S. R., Hardy, C. and Nord, W. R. (Eds). Handbook of Organization Studies, pp.276-292. London: Sage.</li> <li>6. French, J. R. P. Jr. and Raven, B. (2019). The bases of social power. In D. Cartwright(Ed), Group Dynamics: Research and Theory (pp. 259-269). New York: Harper and Row</li> </ol>
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**Teaching and learning methods**

- Online Lecture
- Video Clippings
- Group Discussion
- ICT (Information communication Technology)

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

<b>CO 1</b>	Familiar with basic concepts in leadership development	<b>K2</b>
<b>CO 2</b>	Make effective relationship with peer team	<b>K4</b>
<b>CO 3</b>	Gain knowledge of HR and legal policies	<b>K2</b>

**Mapping Course Outcome**

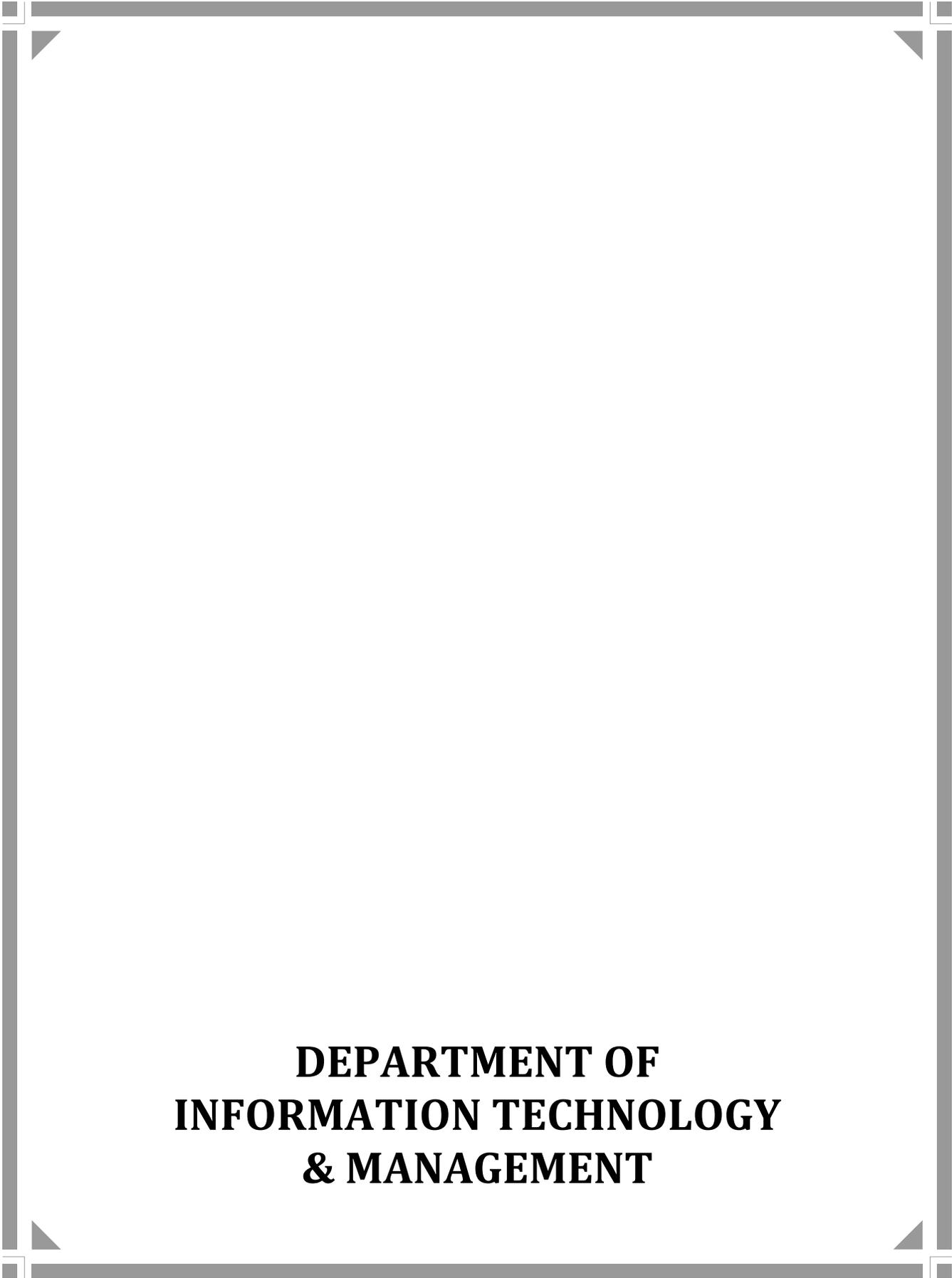
<b>Objectives</b>	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>Outcome</b>														
CO1	3					3	2							8
CO2		2						3						5
CO3			3		3						3			9
CO4				3										3
CO5				3	3			2			1			9
<b>Grand Total of COs with PSOs and POs</b>														<b>34</b>
<b>Mean Value of COs with PSOs and POs = 34/13</b>														<b>2.6</b>

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COS with PSOs and POs			2.6
Observation	<b>COs of Essentials Leadership – Strongly related with PSOs and POs</b>		

**K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 = Create**





**DEPARTMENT OF  
INFORMATION TECHNOLOGY  
& MANAGEMENT**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
(Reaccredited by NAAC with "A" Grade with a CGPA of 3.66)  
**DEPARTMENT OF INFORMATION TECHNOLOGY & MANAGEMENT**  
**Programme Specific Outcome (PSO)**

1. An ability to learn current techniques and modern tools necessary to develop the software applications, business.
2. An ability to identify, analyze, formulate and solve technical problems by applying principles of Information Technology and Management to the problem.
3. An ability to take up multidisciplinary projects and to carry out it as per industry standards.
4. An ability to understand and apply the technical solutions in a global and social context.
5. An ability to understand and practice professional, ethical, legal, and social responsibilities as a matured citizen.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF IT & M**  
**OBE SYLLABUS (From 2022-2023 onwards)**

<b>I SEMESTER</b>				
<b>Part</b>	<b>Subject Code</b>	<b>Subject Title</b>	<b>Hours</b>	<b>Credits</b>
I	22UTAL11/ 22UHNL11/ 22USNL11	Tamil/ Hindi/ French	6	4
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream – B	5	4
III	22UITC11	<b>Core – 1</b> Principles of Management	4	4
	22UITC21	<b>Core – 2</b> Programming in C	3	3
	22UITP11	Programming in C - Lab-1	5	3
	22UITA11	<b>Allied -1</b> Digital Principles	5	4
IV	22UFCE11	<b>FC –</b> Personality Development	1	1
	22UCSH12	Communication Skill	1	-
	22UBRC11	Bridge Course		1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NSS/NCC/Phy.Edn./YRC / ROTARACT/AICUF/Nature Club	-	-
<b>Total</b>			<b>30</b>	<b>24</b>
<b>II SEMESTER</b>				
I	22UTAL22/ 22UHNL22/ 22USNL22	Tamil/ Hindi/ French	6	4
II	22UENA22 22UENB22	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream – B	5	4
III	22UITC32	<b>Core – 3</b> Programming in C++	3	3
	22UITC42	<b>Core – 4</b> Data Structures & Algorithms	4	3
	22UITP22	Programming in C++ - Lab - 2	5	3
	22UITA22	<b>Allied – 2</b> Environment of Business	5	4
IV	22UFCH22	<b>FC-</b> Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skill	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB 12	Extension Activities NSS/NCC/Phy. Edn./YRC / ROTARACT/AICUF/Nature Club	-	1
<b>Total</b>			<b>30</b>	<b>24</b>

<b>III SEMESTER</b>				
III	22UITC53	<b>Core – 5</b> Operating Systems	5	4
	22UITC63	<b>Core – 6</b> DBMS	4	3
	22UITC73	<b>Core – 7</b> Web Technology	4	3
	22UITP33	Programming in Web Technology Lab -3	5	3
	22UITA33	<b>Allied – 3</b> Business Accounting	5	4
IV	22UITN13	Basic Tamil / Advanced Tamil / <b>NME-1</b> Image Editing Tools	3	2
	22UITS13	<b>Skill based Elective- 1</b> Business Law	3	2
	22UFCE33	<b>FC-Environmental Studies</b>	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB2 4	<b>Extension Activities</b> NSS / NCC / Phy.Edn./ YRC /ROTARACT / AICUF /Nature Club	-	-
	22UARE14	ARISE	-	-
<b>Total</b>			<b>30</b>	<b>22</b>
<b>IV SEMESTER</b>				
III	22UITC84	<b>Core – 8</b> Organizational Behaviour	4	4
	22UITC94	<b>Core – 9</b> Computer Network	5	4
	22UITD04	<b>Core – 10</b> Dot Net Programming	4	2
	22UITP44	Dot Net Programming Lab - 4	5	3
	22UITA44	<b>Allied–4</b> Web Marketing	5	4
IV	22UITN24	Basic Tamil / Advanced Tamil / <b>NME- 2</b> Ethical Hacking	3	2
	22UITS24	<b>Skill based Elective - 2</b> Business Statistics	3	2
	22UFCH44	<b>FC - Religious Literacy and Peace Ethics</b>	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB2 4	Extension Activities NSS / NCC / Phy.Edn. / YRC /ROTARACT / AICUF /Nature Club		1
	22UARE14	ARISE	-	1
<b>Total</b>			<b>30</b>	<b>24</b>

V SEMESTER				
III	22UITD15	<b>Core - 11</b> Software Engineering	5	4
	22UITD25	<b>Core – 12</b> Research Methodology	5	4
	22UITD35	<b>Core – 13</b> Marketing Management	5	4
	22UITD45	<b>Core – 14</b> Java Programming	5	4
	22UITP55	Programming in Java Lab - 5	5	4
	22UITE15	<b>Core Elective - 1</b> Human Resource Management	3	3
IV	22UINT15	<b>Internship (Holidays)</b>		1
	22USSI16	Soft Skills	2	
		<b>Total</b>	<b>30</b>	<b>24</b>
VI SEMESTER				
	22UITD56	<b>Core – 14</b> Mobile Application Development	5	4
	22UITP66	Mobile Programming Lab - 6	5	4
	22UITD66	<b>Core – 15</b> Advertising and Salesmanship	5	4
	22UITD76	<b>Core – 16</b> Entrepreneurship Development	5	4
	22UITD86	<b>Core – 17</b> Project	5	4
	22UITE26	<b>Core Elective– 2</b> Internet of Things	3	3
	22USSI16	Soft Skills	2	2
		<b>Total</b>	<b>30</b>	<b>25</b>

Semester	I	II	III	IV	V	VI	TOTAL
Credits	24	24	22	24	24	26	144*

#### Non-Major Electives

For Non-Science Students : Image Editing Tools

For Science Students : Ethical Hacker

#### Self-Learning Course

Semester	Subject Code	Title of the Paper	Credits
Semester-III	22UITSL3	Scripting Languages	3
Semester-IV	22UITSL4	Stress Management	3
Semester-V	22UITSL5	Cyber Security	3
Semester-VI	22UITSL6	Export and Import Management	3

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT & M**

Class : III IT & M

Part : III Core-11

Semester : V

Hours : 75

Subject Code : 22UITD15

Credits : 04

**SOFTWARE ENGINEERING**

**Course Educational Objectives (CEO)**

- 1: To be familiar with basic concepts of Software Engineering.
- 2: Impart the knowledge about Software Cost Estimation Factors & Techniques.
- 3: Knowledge about Software Requirement specification and analysis.
- 4: To gain comprehensive knowledge about Software Design Process.
- 5: Understand Software Quality Assurance & Maintenance concepts.

UNIT	Content	No. of Hours
I	<b>Introduction to Software Engineering</b> Software Features – size factors – Quality and Productivity Factors – Management issues - Planning a software project: Defining the problem – Developing a solution strategy – Planning the development process – Planning an Organizational Structure.	15
II	<b>Overview of Software Cost Estimation</b> Software Cost Factors – Software Cost Estimation Techniques – Staffing Level Estimation Estimating Software Maintenance Costs.	15
III	<b>Software Requirements</b> The Software Requirement Specification–Formal Specification Techniques: Relational Notations – Languages and Processors for Requirements Specification: PSL/PSA-Structured System Analysis- GIST.	15
IV	<b>Software Design</b> Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques.	15
V	<b>Verification and Validation Techniques</b> Quality Assurance – Walkthroughs and Inspections – Static Analysis – Unit Testing and Debugging – System Testing - Software Maintenance: Enhancing Maintainability during Development – Managing aspects of Software Maintenance . Configuration Management, Source Code Metrics.	15

**Book for Study:**

1. Richard E. Fairly, “ Software Engineering Concepts”, Tata McGraw-Hill, New Delhi, 1997.

**Book for Reference:**

1. Roger S Pressman, “ Software Engineering”, Tata McGraw-Hill, New Delhi , 2005.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

CO1: Interpret with basic concepts of Software Engineering.(k3)

CO2: Discover the Strong knowledge about the Software Cost Estimation Techniques.(k3)

CO3: Discover the Software Requirement specification methods. (k3 )

CO4: Describe the Software Designing Techniques. (k3 )

CO5: Discover the Knowledge about the Software Testing and Software Maintenance Process (k4).

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	3	2			3	3	3	1					18
CO2	2	2	3	2	1	2	1	2	3					18
CO3	1	3	2	2		1	2	2	2	3				18
CO4	2	2	3	3	1	3	2	1	2	1				20
CO5	3	3	3	3		2	3		2	1				20
<b>Grand Total of COs with PSOs and POs</b>														<b>94</b>
<b>Mean Value of Cos with PSO and POs(94/43)</b>														<b>2.18</b>

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and POs			<b>2.18</b>
Observation	<b>COs of Software Engineering Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT & M**

Class : III IT & M

Part : III Core- 12

Semester : V

Hours : 75

Subject Code : 22UITD25

Credits : 4

**RESEARCH METHODOLOGY**

**Course Educational Objectives (CEO)**

- 1: Knowing the basic concepts of research methodology.
- 2: Understanding the concept of sampling and data collection.
- 3: Learning the concepts of Scaling and Tools of Analysis.
- 4: Knowing the Data Classification and Report Writing.
- 5: Develop the knowledge in Technology of Research.

UNIT	Content	No. of Hours
I	<b>Introduction to Research Methodology</b> Objectives –Characteristics - Types – Significance - Research Process - Criteria of Good Research – Scope of Business Research.	15
II	<b>Sampling</b> Definition – Need for sampling – Characteristics – Advantages and disadvantages - Steps - Types – Probability and Non Probability sampling Methods- Factors consider in sampling design.	15
III	<b>Data Collection</b> Primary Data – Secondary Data - Advantages and Disadvantages - Methods of Data Collection- Experiment Method – Survey Method - Questionnaire – Merits & Demerits – requisites of good Questionnaire – Kinds of Questions – Steps to Construct Questionnaire.	15
IV	<b>Scaling Techniques and Hypothesis</b> Definition – approaches for scale constructions – types of scaling techniques – Hypothesis – types – Features – Steps in Hypothesis testing – Role of Hypothesis.	15
V	<b>Report Writing</b> Purpose- Essentials of Good Report – Types – Layout Contents of research report – Problems encountered by researchers in India – Uses of Library – Role of internet in Research	15

**Book for Study:**

1. C.R. Kothari, 2014 - II Edition, "Research Methodology", Sultan Chand and Sons, New Delhi.

**Book for Reference:**

1. Saravanavel, 1987 - I Edition, "Research Methodology", Prentice Hall Publications.
2. Sharma Ram Nath, VI Edition, "Research Methods in Social Sciences", Media

Promoters and Publishers Pvt Ltd.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Brain Storming, Case Study, Assignments etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

1. Recognize the students to know the basic concepts of Research Methodology.( K3 )
2. Compose the knowledge about methods of data collection and sampling. ( K3 )
3. Manipulate the skills to Scaling and Measurement Techniques. ( K3 )
4. Practice the students to know the research report writing. ( K4)
5. Outline the concepts of Use of Library and internet in Research. ( K5 )

**Mapping Course outcome**

Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	2	3	3	3		2	3	1		1				18
CO2	2	3	2	2	3	3	1	2	2	1				21
CO3	3	3	2	3		3	1	3	3					21
CO4	3	2	3	2	1	2	3	2	2	1				21
CO5	2	2	3	3		3	3	3	2	2				23
<b>Grand Total of COs with PSOs and PO</b>														<b>104</b>
<b>Mean Value of COs with PSO and PO(104/45)</b>														<b>2.31</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and POs			<b>2.31</b>
Observation	<b>COs of RESEARCH METHODOLOGY Strongly related with PSOs and PO</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT & M**

Class : III IT & M

Part : III Core- 13

Semester : V

Hours : 75

Subject Code : 22UITD35

Credits : 4

**MARKETING MANAGEMENT**

**Course Educational Objectives (CEO)**

- 1: Knowing the basic concepts of Marketing Management.
- 2: Understanding the concept of product and its classification.
- 3: Learning the pricing concepts and its types.
- 4: Comprehending the concept of channel of distribution and advertising.
- 5: Develop the knowledge about Personal Selling.

UNIT	Content	No. of Hours
I	<b>Introduction on Marketing</b> Marketing-nature and scope - Classification of Markets - Evolution of marketing concept - Functions of marketing - Consumer Behavior - Buying motives – Consumer Decision making.	15
II	<b>Product</b> Concept of Product – Features - Product Classification - New product development -Product life cycle – Branding and packaging- Features – Types - Functions of packaging.	15
III	<b>Pricing</b> Objectives -Factors affecting Pricing – Pricing Policies - Cost oriented pricing, Demand oriented pricing, Cost-demand based, competitive pricing - Price Discrimination - Kinds of pricing.	15
IV	<b>Channel of Distribution &amp; Advertising</b> Functions - importance of channel – types of channel of distribution- Factors to be considered in channel selection- Advertising: Objectives– Types of Advertising- Media Selection.	15
V	<b>Personal Selling</b> Concept- Kinds of Salesmanship- Importance- Kinds of Salesman- Personal Selling Process- Selection and recruitment of Sales force- Remunerating Salesmen- Motivating Sales force.	15

**Book for Study:**

1. Marketing Management by R.S.N.Pillai and Bagavathi, 2010 – Sultan Chand and Sons, New Delhi.

**Book for Reference:**

1. Marketing Management by Dr. C. B. Gupta, Dr. N. Rajan Nair, 2018, Sultan Chand and Sons, NewDelhi.
2. Marketing Management by Philip Kotler, 2017 –15<sup>th</sup> Edition, Pearson Education India.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Brain Storming, Case Study, Assignments etc.,)

**Course Outcome (CO)**

On completion of the course, students should be able to

1. Label the basic concepts of marketing and its functions. (K3)
2. Develop the skills to new product development. (K3)
3. Match the objectives of pricing and kinds. (K3)
4. Illustrate the knowledge about distribution channels and Advertising. (K4)
5. Utilize the concepts of Personal Selling. (K4)

**Mapping Course outcome**

Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & Pos
CO1	1	3	3		2	3	2	1	2					17
CO2	3	2	3	3	3	2	2	2	1					21
CO3	2	3	2	3		1	3	2	3	2				21
CO4	3	2	3	3	1	3	2	1	2	2				22
CO5	2	3	3	2		3	3	3	2	1				22
<b>Grand Total of COs with PSOs and PO</b>														<b>103</b>
<b>Mean Value of COs with PSO and PO(103/45)</b>														<b>2.29</b>

Strong-3, Medium-2 & Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and Pos			<b>2.29</b>
Observation	<b>COs MARKETING MANAGEMENT Strongly related with PSOs and PO</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT & M**

Class : III IT & M

Part : III Core- 14

Semester : V

Hours : 75

Subject Code : 22UITD45

Credits : 4

**JAVA PROGRAMMING**

**Course Educational Objectives (CEO)**

1. Understand Java Features, Environment and tokens
2. Understand learn class, Methods
3. Able to Develop Inheritance
4. Able to Develop Multi-Tier Programs.
5. Able to learn Applet Graphics & JDBC Concepts.

UNIT	Content	No. of Hours
I	<p><b>Introduction to Java</b>                      Java History - Java Feature – Comparison of Java and other Languages - Java and Internet, Java Environment - Java Development Kit - API - Byte codes - Java Virtual Machine - Hardware &amp; Software Requirements.                      Simple Java Program – Comments- Java Tokens - Character Set - Keyword - Identifier - Literals - Operators - Separator - Command Line Arguments.</p>	15
II	<p><b>UNIT – II: Classes, Object and Methods</b>                      Defining Class - Adding Variables, Methods - Creating Objects - Accessing Methods - Constructors - Method Overloading, Overriding - Nesting of Methods - Static Members - Final Variables, Methods and Classes - Abstract method - Visibility Controls - Arrays - Strings - Vectors.</p>	15
III	<p><b>UNIT – III: Inheritance and Interface</b>  <b>Inheritance:</b> Inheritance – Introduction - Exception. <b>Interface</b> - Defining Interfaces - Extending Interfaces - Implementing interfaces - Accessing Interface variables.</p>	15
IV	<p><b>AWT, Threading and Packages</b>  <b>AWT:</b> Layout Managers – Basic Controls, Text Box, List Box, Combo Box, Radio Button, Check Box, Button Events, Action Listener.  <b>Multithreading:</b> Creating Thread - Stopping and blocking a Thread -Life cycle of Thread - Thread priority - Synchronization. <b>Packages:</b> Java API Packages - Using System Packages - Creating and Accessing Packages- Using a package - Adding class to package.</p>	15

V	<b>Applet &amp; JDBC</b> <b>Applets and Graphics:</b> Fundamentals of Applets - Local & Remote Applets - Applet and Application Difference - Building Applet code - Applet Life Cycle - Applet tag - Adding Applet to HTML - Running the Applet - Drawing methods of Graphics Class. <b>JDBC:</b> Introduction to JDBC – Creation of Database – Accessing Database through JDBC.	15
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**Book for Study:**

- a. E. Balagurusamy, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> Edition, “Programming with Java”, Tata McGraw Hill Pub. Ltd., New Delhi.
- b. Muthu, Second Edition, “Programming with Java” Vijay Nicole Imprints, Chennai. Unit – IV: Chapters 18.

**Book for Reference:**

Patrick Naughton, Herbert Schildt, 3rd Edition, “The Complete Reference Java2”, Tata McGraw Hill Pub. Ltd., New Delhi.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

- 1: Discover the Strong knowledge about Java Features, Tokens.(k3)
- 2: Identify to create Class & Object Programs. (k3)
- 3: Discover to create Interface Concepts. (k3)
- 4: Convert Multi-Tier Programs using AWT, Packages & Multi-Thread.(k4)
- 5: Estimate to Connect Database & Design Using APPLET Graphics. (k4)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	3	1	2		3	3	3	1					19
<b>CO2</b>	2	2	3	2	1	3	2	2	1					18
<b>CO3</b>	2	2	2	3	2	2	1	1	3	2				20
<b>CO4</b>	2	3	3	2		2	2	2	2	1				19
<b>CO5</b>	3	3	2	2	1	3	2	1	2	1				20
<b>Grand Total of COs with PSOs and POs</b>														<b>96</b>
<b>Mean Value of Cos with PSO and POs(96/46)</b>														<b>2.09</b>

\*: S-Strong; M-Medium; L-Low

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of Cos with PSOs and POs</b>			<b>2.09</b>
<b>Observation</b>	<b>Cos of Java Programming Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF IT & M**

Class	: III IT&M	Part	: III Core Lab - 5
Semester	: V	Hours	: 75
Sub code	: 22UITP55	Credits	: 04

**Programming in JAVA Lab**

**Course Educational Objectives (CEO)**

1. Understand Java Features, Environment and tokens
2. Understand learn class, Methods
3. Able to Develop Inheritance
4. Able to Develop Multi-Tier Programs.
5. Able to learn Applet Graphics & JDBC Concepts.

UNIT	Content	No. of Hours
I	Tokens, Operators, Control Structures, Data Types, Command Line Arguments	15
II	Class & Objects, Methods – Method Overloading, Final Keywords, Strings, Arrays	15
III	Inheritance - Interface and types - Exceptions	15
IV	AWT, Packages. Threads – Set Priority, Thread methods,	15
V	Applets and Graphics – JDBC.	15

**Book for Study:**

1. E. Balagurusamy, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> Edition, “Programming with Java”, Tata McGraw HillPub. Ltd., New Delhi.
2. Muthu, Second Edition, “Programming with Java” Vijay Nicole Imprints, Chennai. Unit – IV: Chapters 18.

**Book for References:**

Patrick Naughton, Herbert Schildt, 3rd Edition, “The Complete Reference Java2”, Tata McGraw Hill Pub. Ltd., New Delhi.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

- 1: Discover the Strong knowledge about Java Features, Tokens. (K3)
- 2: Identify to create Class & Object Programs. . (K3)
- 3: Discover to create Interface Concepts. (K4)
- 4: Convert Multi-Tier Programs using AWT, Packages & Multi-Thread. (K4)
- 5: Estimate to Connect Database & Design Using APPLET Graphics. (K5)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	3	3	2		3	3	3	1					21
<b>CO2</b>	2	2	3	3	2	3	2	2	2					21
<b>CO3</b>	3	2	2	3	3	2	2	3	3	2				25
<b>CO4</b>	2	3	3	2	3	3	2	2	3	2				25
<b>CO5</b>	3	3	2	3	2	3	3	3	3	1				26
<b>Grand Total of COs with PSOs and POs</b>														<b>118</b>
<b>Mean Value of Cos with PSO and POs(118/47)</b>														<b>2.51</b>

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of Cos with PSOs and POs</b>			<b>2.51</b>
<b>Observation</b>	<b>Cos of JAVA PROGRAMMING Lab - 5 Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT & M**

Class : III IT & M  
Semester : V  
Subject Code : 22UITE15

Part : Core Elective 1  
Hours : 45  
Credits : 03

**HUMAN RESOURCE MANAGEMENT**

**Course Educational Objectives (CEO)**

1. Understanding the basic knowledge of Human Resource Management
2. Comprehend the Manpower planning and Job Analysis
3. Learning the different wage systems and Training Methods
4. Studying the Industrial Relation and Trade Union
5. Knowing the Performance Appraisal System and Collective Bargaining

<b>UNIT</b>	<b>Content</b>	<b>No. of Hours</b>
I	<b>Introduction to Human Resource Management</b> Human Resource Management – Definition – Concepts –Objectives–Functions-Personnel Management vs HRM.	9
II	<b>Manpower Planning</b> Manpower Planning – Job Analysis – Job description - Job Specification – Job evaluation - Sources of Recruitment – Steps in Selection process.	9
III	<b>Employee Training and Development</b> Need for Training-Importance-Methods of Training Techniques – Principles of Training – Employee Development- Objectives – Method and Techniques of executive development.	9
IV	<b>Trade Union and Industrial Disputes</b> Trade union – Features – Objectives- Functions – Industrial Disputes – Causes for Industrial Disputes – Prevention of Industrial Disputes – Settlement of Industrial Disputes.	9
V	<b>Performance Appraisal and Quality of work life</b> Performance Appraisal- Methods- Importance - Quality of Work life – Dimensions – Principles – Techniques – Determinants of quality of work life.	9

**Book for Study:**

1. C.B Gupta, Human Resource Management, Sultan Chand & Sons Publication, New Delhi, Tenth Edition-2009

**Book for References:**

1. Gary Dessler, "Human Resource Management" Prentice-Hall of India P.Ltd., Pearson, Seventh Edition
2. Dr.S.S.Khanka, "Human Resource Management" S.Chand & Company Ltd., New Delhi-2003.
3. Dr. R.Venkatapathy & Assissi Menacheri, . Industrial Relations & Labour Welfare, Adithya Publications, CBE, 2001.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

**Course Outcome (CO)**

On completion of the course, students should be able to

1. Label the Basic functions of Human Resource Management (k3)
2. Interview the Recruitment and selection process (k3)
3. Adapt the different types of wages system and Training methods(k3)
4. Summarize the Industrial Relations and Grievance Handling system(k4)
5. Relate the best method of Performance appraisal system(k4)

**Mapping Course outcome**

Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & Pos
CO1	3	3	3			2	3	2	1					17
CO2	3	2	2	2	3		1	2	2					17
CO3	3	2	3	2		2	1	2		3				18
CO4	2	3	2	2	3	3	2	2	1					20
CO5	2	2	3	3		1	3	3	1	2				20
<b>Grand Total of COs with PSOs and PO</b>														<b>92</b>
<b>Mean Value of Cos with PSO and PO(92/41)</b>														<b>2.24</b>

**Strong-3, Medium-2 & Low-1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of Cos with PSOs and Pos</b>			<b>2.24</b>
<b>Observation</b>	<b>COs of HUMAN RESOURCE MANAGEMENT Strongly related with PSOs and PO</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT & M**

Class : III IT & M

Part : IV

Semester : V

Hours :

Subject Code : 22UINT15

Credits : 01

**INTERNSHIP**

**Course Educational Objectives (CEO)**

1. Gain practical experience in their respective fields of study.
2. Become more comfortable working in a professional business setting.
3. Expand their professional networks.
4. Improve their interpersonal and communications skills.

**Course Outcome (CO)**

On completion of the course, students should be able to

1. Explore the knowledge in Software development.
2. Develop the communication, Inter-personal Skills for job interviewing process.
3. Develop work habits and attitudes necessary for job success.

**Description:**

- The internship is an integral part of the curriculum for the successful completion of the IT&M programme.
- It is designated for III-year IT&M students to improve their Programming Skills, and analytical skills, and provide them with practical experience.
- The essence of the Internship is to help students gain skills in Programming, quantitative and qualitative techniques such as internee in IT companies, Management Companies, Developing software, observation and note-taking, formal and informal interviewing, surveys, and report writing skills.
- This will help students to imbibe entrepreneurial skills and to develop better perceptions of local culture and business strategies.

**Supervision, dates and Duration of the Institutional Training**

- Every student has to undergo a field meeting with a company during the summer vacation after the fourth semester. They will have to conduct an interview about their business and submit their report within one month in the department.
- Each student will be attached to one faculty guide, with whom he/she shall be in continuous touch during the Internship.
- The faculty guide will be required to evaluate the report for 25 marks and the corresponding company manager will evaluate the performance and report for 25 marks.
- The evaluation of the remaining 50 marks shall be made by the department during viva voce based on the student's performance

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF IT & M**

Class : III IT & M  
Semester : V  
Subject Code : 22UITSLS5

Part : Self Learning  
Hours : -  
Credits : 03

**Cyber Security**

**Course Educational Objectives (CEO)**

- 1: Discuss the basic concepts Cyber Security and Threats.
- 2: Imagine the importance of Cyber Security Vulnerabilities and Safe Guards.
- 3: Compute the process of Security in SOAP Services and Identity Management.
- 4: Discriminate the knowledge of Network based Intrusion detection Systems, Network based Intrusion Prevention Systems.
- 5: Practice the Concept of Cryptography and Network Security.

UNIT	Content	No. of Hours
I	<b>Introduction to Cyber Security</b> Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats:- Cyber Warfare- Cyber Crime-Cyber terrorism.	-
II	<b>Cyber Security Vulnerabilities and Cyber Security Safeguards</b> Cyber Security Vulnerabilities-Overview, vulnerabilities in software, System administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Security policy, Threat Management.	-
III	<b>Securing Web Application, Services and Servers</b> Introduction, Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges.	-
IV	<b>Intrusion Detection and Prevention</b> Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management, Network Session Analysis, System Integrity Validation.	-

V	<b>Cryptography and Network Security</b> Introduction to Cryptography, Symmetric key Cryptography, Asymmetric key Cryptography, Message Authentication, Digital Signatures, Applications of Cryptography. Overview of Firewalls- Types of Firewalls, User Management, VPN Security Security Protocols: - security at the Application Layer- PGP and S/MIME, Security at Transport Layer- SSL and TLS, Security at Network Layer-IPsec.	-
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**Book for Study:**

1. Nihad Hassan, Rami Hijazi, 2017 - "Digital Privacy and Security Using Windows: A Practical Guide A Press.

**Book for Reference:**

1. Lester Evans, 2018-"Cyber Security" An Essential Guide to Computer and Cyber Security for Beginners.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

**Course Outcome ( CO)**

1. Understood the Concept of Cyber Security.(k3)
2. Applying the knowledge of Cyber Security Vulnerabilities and Cyber Security Safeguards(k3)
3. Developing their managerial skills SOAP Services and Identity Management(k3)
4. Knowing the basic techniques Network based Intrusion detection Systems, Network based Intrusion Prevention Systems(k4)
5. Understanding the Techniques of Cryptography and Network Security. (k4)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	3	1	3		2	2	2	1					17
CO2	2	2	2	2	1	2	2	2	2					17
CO3	3	3	2	2		2	1		2	2				17
CO4	3	2	3	2	1	2	2	2	2	1				20
CO5	2	3	3	2		2	2	2	3	1				20
<b>Grand Total of COs with PSOs and PO</b>														<b>91</b>
<b>Mean Value of COs with PSO and PO(91/44)</b>														<b>2.07</b>

Strong-3, Medium-2 & Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and Pos			<b>2.07</b>
Observation	<b>COs of CYBER SECURITY Strongly related with PSOs and PO</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF IT & M**

Class : III IT & M  
 Semester : VI  
 Subject Code 22UITD56

Part : III Core - 14  
 Hours : 75  
 Credits : 04

**Mobile Application Development**

**Course Educational Objectives (CEO)**

- 1: Understand the concepts of Mobile Applications development and its Framework.
- 2: Impart the knowledge of Mobile Application Development Tools.
- 3: Develop the knowledge of Creating Mobile Applications and Activities.
- 4: Develop the efficient User Interface of Mobile Applications.
- 5: Able to understand the Resources of Mobile Application Development Tools.

UNIT	Content	No. of Hours
I	<b>A Little Background Mobile Applications:</b> The Future An open platform for mobile development and Nativeandroid applications - Android SDK features - Introducing the Development Framework - Developing for Android – Developing for Mobile Devices.	15
II	<b>Mobile development tools:</b> Hardware - Imposed Design Considerations - Environment, Developing for Android and To-Do List Example - The Android Emulator ,Dalvik Debug Monitor Service (DDMS) - The AndroidDebug Bridge (ADB)	15
III	<b>Creating applications and activities:</b> The Android Application Life Cycle - Understanding Application Priority and Process States - Extending and Using the Application Class - <b>Creating an Activity</b> - Creating an Activity - Android Activity Classes.	15
IV	<b>Creating user interfaces :</b> Fundamental android UI design - Introducing Views - Creating Activity User Interfaces with Views - The Android Widget Toolbox - <b>Introducing layouts</b> - Using Layouts, Optimizing Layouts – <b>Creating new views</b> - Modifying Existing Views - Creating Compound Controls - Creating Custom Views.	15
V	<b>Resources:</b> Drawable resources - Shapes, Colors, and Gradients, Color Drawable, Shape Drawable, Gradient Drawable, Composite Drawable - <b>Creating and using menus</b> - Introducingthe Android Menu System - Defining an Activity Menu - Menu Item Options - Menu Item Options.	15

**Book for Study:**

“Reto Meier “ Professional Android 2 Application Development John Wiley & Sons,2010

**Book for References:**

Mark Murphy "Android "A press 2009.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

CO1: Summarize the concepts of Mobile Applications Development.(k3)

CO2: Experiment the knowledge about Mobile Application Development Tools.(k3)

CO3: Create New Innovative Android Applications and Activities. (k3)

CO4: invent Android User Interfaces and Views. (k4)

CO5: Formulate how to use the various resources to creating the Mobile Applications. (k4)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & Pos
CO1	2	3	3	3		2	2	2	1					18
CO2	3	2	3	2	2	3		2	1					18
CO3	1	3	2	2	1	3		1	2	3				18
CO4	2	2	2	3	1	2	2	3		1				18
CO5	3	2	3	2		2	2	1		3				18
<b>Grand Total of COs with PSOs and PO</b>														<b>90</b>
<b>Mean Value of COs with PSO and POs</b>														<b>2.14</b>

Strong-3, Medium-2 & Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and Pos			<b>2.14</b>
Observation	<b>COs of Mobile Application Development Strongly related with PSOs and PO</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT & M**

Class	: III IT & M	Part	: III Lab – 6
Semester	: VI	Hours	: 75
Subject Code	: 22UITP66	Credits	: 04

**Mobile Programming Lab**

**Course Educational Objectives (CEO)**

- 1: Understand the concepts of Mobile Applications development and its Framework.
- 2: Impart the knowledge of Mobile Application Development Tools.
- 3: Develop the knowledge of Creating Mobile Applications and Activities.
- 4: Develop the efficient User Interface of Mobile Applications.
- 5: Able to understand the Resources of Mobile Application Development Tools.

UNIT	Content	No. of Hours
I	Simple Android Application using Basic SDK - Frameworks and - Services	15
II	Designing Android Applications – Creating Android Applications using Emulators	15
III	Creating Android Applications Using Priority and Process States – Creating Activities in Android Applications	15
IV	Creating Android Applications Using Layouts – Custom Views – Compound Controls.	15
V	Creating Android Applications with Drawable Resources – Shapes – Colors. Creating Menus in Android Applications.	15

**Book for Study:**

“Reto Meier “ Professional Android 2 Application Development John Wiley & Sons,2010

**Book for References:**

Mark Murphy “Android “A press 2009.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

CO1: Infer the concepts of Mobile Applications Development.(K3)

CO2: Criticize knowledge about the Mobile Application Development Tools.(K3)

CO3: Examine New Innovative Android Applications and Activities. (K3)

CO4: Create Android User Interfaces and Views. (K3)

CO5: Test the various resources to creating the Mobile Applications.(K3)

### Mapping Course outcome

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & Pos
CO1	2	3	3	3		3	3	2	2					21
CO2	3	2	3	2	2	3	2	3	3	1				24
CO3	2	3	2	2	2	3	2	3	3	3				25
CO4	3	2	3	3	2	2	2	3	3	2				25
CO5	3	2	3	2	3	2	3	2	2	3				25
<b>Grand Total of COs with PSOs and PO</b>														<b>120</b>
<b>Mean Value of COs with PSO and PO(120/48)</b>														<b>2.5</b>

Strong-3, Medium-2 & Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and Pos			2.5
Observation	COs of Android Programming Lab - 6 Strongly related with PSOs and PO		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT & M**

Class : III IT & M Part : III Core 15  
Semester : VI Hours : 75  
Subject Code : 22UITD66 Credits : 4

**ADVERTISING AND SALESMANSHIP**

**Course Educational Objectives (CEO)**

1. Understanding the basic knowledge of Advertising
2. Comprehend the social and Ethical aspects of Advertising
3. Learning the Advertising Agency and Advertising Media
4. Studying the concept of Salesmanship
5. Knowing the kinds of Negotiable and Non-Negotiable Instruments

UNIT	Content	No. of Hours
I	<b>Introduction to Advertising</b> Meaning-Definition-Characteristic-Objectives-Nature Scope –Types-Importance-Functions of Advertising	15
II	<b>Social and Ethical Aspects of Advertising</b> Social issues in Advertising-The responsibility of the advertiser-Positive social effects of Advertisements- Advertising and cultural value-Ethical issues in Advertising-improving advertising Ethics	15
III	<b>Advertising Agencies ,Budget and Expenditure</b> importance, Role and functions. Organizational structure- Advertising Department - Type of Advertisement Agencies. Advertisement appropriation- Method and current practices- Evaluation of Advertisement Effectiveness.	15
IV	<b>Salesmanship</b> Definition-features-Objectives-Nature-Types- Advantages of Salesmanship--Functions of Salesman- -Quality of a Sales Manager-Advertising vs Salesmanship	15
V	<b>Knowledge of customers</b> –classification of customers – selling process. CRM—Meaning and significance - Types –CRM process—Benefits.	15

**Book for Study:**

1. P.Saravanavel and S. Sumathi, Advertising and Salesmanship– Margham Publications, Chennai- Second Edition- 2009.

**Book for Reference:**

1. M.N. Mishra and P.N.Harikumar, Advertising and Sales Promotion , Himalaya Publishing House, Mumbai First Edition, 2015
2. Frank Jefkins and Daniel Yadin “ Advertising”, Pearson Education, New Delhi, Revised Edition, 2000.
3. Advertising Theory and Practice, Chunawalla, kumar, Sethuia, Subramanian, suchau, Himalaya publishing House, Mumbai
4. Bholanath Dutta and Dr. Girish.C. – I edition – 2011-Himalaya Publishing House.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

**Course Outcome ( CO)**

On completion of the course, students should be able to

1. Infer the Basic knowledge about Advertising and it’s functions(K3)
2. Identify the knowledge about the social and ethical aspect of Advertising(K3)
3. Choose the right Advertising Agencies and best Advertising Media(K3)
4. Propose the basic functions of Salesmanship(K4)
5. Plan the sales Techniques, Remuneration and Control of salesmen(K4)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & Pos
CO1	3	3	1		3	2	2	2	1		2			19
CO2	2	2	2	2	1	2	2	2	2	2				19
CO3	1	3	3	3	3	2	2	2	2	2	1			24
CO4	3	2	2	2	1	2	2	3	3	2	2			24
CO5	3	3	2	3		3	3	2	3		2			24
<b>Grand Total of COs with PSOs and PO</b>														<b>110</b>
<b>Mean Value of COs with PSO and PO(110/50)</b>														<b>2.2</b>

Strong-3, Medium-2 & Low-1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of Cos with PSOs and Pos</b>			<b>2.2</b>
<b>Observation</b>	<b>COs of ADVERTISNG AND SALESMANSHIP Strongly related with PSOs and PO</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF IT & M**

Class : III IT & M  
Semester : VI  
Subject Code : 22UITD76

Part : III Core- 16  
Hours : 75  
Credits : 4

**ENTREPRENEURSHIP DEVELOPMENT**

**Course Educational Objectives (CEO)**

- 1: Knowing the basic concepts of Entrepreneur.
- 2: Understanding the concept of Women Entrepreneurship and NGO's.
- 3: Learning the concepts of ownership structure.
- 4: Knowing the concept of project report formulation.
- 5: To study the growth strategies in small business.

Unit	Content	No. of Hours
I	<b>Introduction to Entrepreneur</b> Concept – Characteristics of entrepreneur - Functions - Types - Entrepreneurship: Concept - Role of Entrepreneurship in Economic Development - Distinction between Entrepreneur and manager – Intrapreneur- concept.	15
II	<b>Women Entrepreneurship</b> Concept - Functions - Growth – Recent trends - Problems of women Entrepreneurs - Entrepreneurial competencies - Rural Entrepreneurship:Need – Problems - Role of NGO's in development of Rural Entrepreneurship.	15
III	<b>Form of Business Enterprises and EDP</b> Ownership Structure - Proprietorship - Partnership - Company - Co-operatives- Advantages and Disadvantages- Selection on appropriate Ownership Structure - Entrepreneurship Development Programme – Objectives- Course Contents – phases - Evaluation.	15
IV	<b>Project Formulation</b> Project Report - Significance - Contents - Formulation of a project report - Planning commission Guidelines –Specimen of a project report- Project appraisal – Concept - Methods of project appraisal.	15
V	<b>Growth Strategies in Small Business</b> Objectives-Stages-Types of growth strategies-Expansion-Diversification-Joint Venture – Merger - Sub-Contracting - Franchising: Advantages-Disadvantages - Franchising in India.	15

**Book for Study:**

1. S.S.Khanka, 2020, revised edition, “Entrepreneurial Development”, S. Chand & Co., New Delhi, India,

**Book for References:**

1. CB. Gupta, 2009 - VII Edition, "Entrepreneurial Development", Sultan Chand & Sons
2. Vasanth Desai, 1980 "Entrepreneurial Development", Himalaya Publishing House, Second revised.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Brain Storming, Case Study, Assignments etc.,)

**Course Outcome (CO)**

On completion of the course, students should be able to

1. Prepare the students to know the basic concepts of Entrepreneurship.(k3)
2. Survey the knowledge about women Entrepreneurs and Rural Entrepreneurship. (k3)
3. Test for the skills to Form of Business Enterprises. (k3)
4. Plan the students to Formulation of a project report. (k4)
5. Recommend the students to know the growth strategies in small business. (k4)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & Pos
CO1	2	2	1	3		3	3	2	1		2			19
CO2	3	2	2	2	1	3	2	2	2	3				22
CO3	2	3	2	3	1	2	1	2	2	2	2			22
CO4	3	2	3	2	3	2	3	1	3	2				24
CO5	3	2	2	3	3	2	3	2	2	2				24
<b>Grand Total of COs with PSOs and PO</b>														<b>111</b>
<b>Mean Value of COs with PSO and PO(111/50)</b>														<b>2.22</b>

Strong-3, Medium-2 & Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and Pos			<b>2.22</b>
Observation	<b>COs of ENTREPRENEURSHIP DEVELOPMENT Strongly related with PSOs and PO</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF IT & M**

Class : III IT&M  
Semester : VI  
Subject Code : 22UITD86

Part : III Core-17  
Hours : 75  
Credits : 04

**PROJECT**

**Objective:**

- Project work aims at exposing the students to various developments taking place in the field of information technology and management.
- Students will select individually Commercial or Technical Project based on Application Development Technologies.
- Students will get exposed to various management practices and their implications in the companies where they are undergoing the project.
- With the known technologies they can develop the software.

**Description:**

- ❖ In the last semester students avail 30 days for project.
- ❖ The Project involves practical work for understanding and solving problems in the field of information technology and management.
- ❖ The report has to be submitted within one month, after consulting the faculty guide.
- ❖ Students submit the attendance certificate from the company in which they have undergone the project work at the time of submission of the report.

Depending upon the interest of students they are sent for exposure to:

2. For developing open source software's and development of software package for the organizations.
3. Software package development for organizations.
4. Carrying out project work in various functional areas of management.
5. Field study to prepare a report on scope of Entrepreneurship in particular area.

The students who are taking the project work in the field of Management have to submit the report as follows:

- Title of the study
- Identification of research problem
- Collection of review of literature
- Selection of the title of the research
- Identification of the statement of the problem
- List out the objectives of research
- Preparation of tools of research
- Data collection
- Data processing
- Preparation of report
- Submission of report

Project evaluation:

<b>Particulars</b>	<b>Mark Criteria</b>
Report Evaluation	50
VIVA – VOCE Examination	50
<b>Total</b>	<b>100</b>

**Note \***

The viva – voce will be conducted by the Head of the Department, the Faculty Guide and External Expert together.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF IT & M**

Class : III IT & M  
 Semester : VI  
 Subject Code : 22UITE26

Part : Core – Elective 2  
 Hours : 45  
 Credits : 3

**INTERNET OF THINGS**

**Course Educational Objectives (CEO)**

- i. Understand the basics of IoT.
- ii. Understand Devices and the Architecture of IoT.
- iii. Gain Knowledge about Data and Human Interaction.
- iv. Ability to understand Living Applications.
- v. Learn about Real World Applications of IoT.

Unit	Content	No. of Hours
I	<b>UNIT – I: INTRODUCTION TO IOT</b> Definition of the Internet of Things - main assumptions and perspectives- Platform for IoT devices - Economics and Technology of the IoT –Issues in IoT and solutions-Architecture of IoT.	9
II	<b>UNIT - II IOT DEVICES</b> Temporary and Ad-hoc devices-Addressing issues-End devices in dedicated networks- Small data Building a web of things-Autonomy and co-ordination- Structuring a tree.	9
III	<b>UNIT - III DATA AND HUMAN INTERACTION:</b> Functions of IoT-Analysis and control-Neighborhood - Human interface and control points- Collaborative scheduling tools-Packaging and provisioning- Distributed integrator functions.	9
IV	<b>UNIT - IV IOT APPLICATIONS:</b> Moore’s Law –Intelligence near the edge- Incorporating legacy devices- Staying in the loop -Social machines-Efficient process control Factory application- Natural sciences- Living applications.	9
V	<b>UNIT – 5 CASE STUDIES ILLUSTRATING IOT DESIGN:</b> Home Automation - Cities - Environment - Agriculture - Productivity Applications.	9

**Book for Study:**

1. Da Francis, Costa, Rethinking the Internet of Things-A scalable approach to connecting everything, 2013, Apress open publication.
2. Waher Peter, Learning Internet of Things, 2015, PACKT Publishing-Birmingham-Mumbai.

**Book for References:**

1. Bahga Arhdee, Madiseti Vijay, Internet of Things: A Hands on Approach (<http://www.internet-ofthings-book.com/>). 2015.
2. Pfister Cuno, Getting started with the Internet of Things, O’Rielly Publication. 2011.

**Web References:**

1. Introduction to IoT:<https://www.javatpoint.com/iot-internet-of-things>
2. Architecture of IoT:<https://www.geeksforgeeks.org/architecture-of-internet-of-things-iot/>  
Syllabus 2023-24 Page 1882
3. IoT Devices :[https://www.tutorialspoint.com/internet\\_of\\_things/index.htm](https://www.tutorialspoint.com/internet_of_things/index.htm)
4. Advanced IoT Applications:<https://nptel.ac.in/courses/108108123>
5. IoT Human Interaction: <https://www.digimat.in/nptel/courses/video/106106177/L01.html>
6. IoT designs:<https://nlist.inflibnet.ac.in/search/Record/EBC5332124>

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

- 1: Describe knowledge about Internet Of Things Working Principles (k3)
- 2: Knowledge about IoT Devices (k3)
- 3: knowledge about Interaction & Integration(k3)
- 4: Knowledge about various lot applications(k3)
- 5: Maximize knowledge through Case Studies (k3)

**vi. Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & Pos
CO1	3	2	1		3	2	2	3	1					17
CO2	2	2	2	2	1	2	2	2	2	2				19
CO3	1	3	2	3	3	3	1	2	3	3				24
CO4	3	3	3	3		3	3	2	3	1				24
CO5	3	2	2	2	3	3	2	2	3	2				24
<b>Grand Total of COs with PSOs and PO</b>														<b>108</b>
<b>Mean Value of COs with PSO and PO(108/47)</b>														<b>2.3</b>

Strong-3, Medium-2 & Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and Pos			<b>2.3</b>
Observation	<b>COs of Internet Of Things Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF IT & M**

Class : III IT & M  
Semester : VI  
Subject Code : 22UITSL6

Part : Self Learning  
Hours :  
Credits : 3

**EXPORT AND IMPORT MANAGEMENT**

**Course Educational Objectives (CEO)**

1. Understanding the basic knowledge about Import and Export Policy
2. Comprehend the Role of Foreign Exchange
3. Learning the Foreign Exchange Market and procedures
4. Studying the Export documentation and procedure
5. Knowing the Recent trends in India's Foreign Trade

UNIT	Content
I	<b>Import Export Policy</b> Introduction – Objectives – India's recent Trade Policy – New Foreign Trade Policy – Important features of policy changes.
II	<b>Foreign Exchange</b> Definition – Rate of exchange - Fluctuations in the rate of exchange – Stable vs. Fluctuating rate of exchange.
III	<b>Foreign Exchange Market</b> Meaning – Advantages and limitations of foreign exchange facilities – Payment procedure followed in Foreign exchange.
IV	<b>Export documentation and procedure</b> Meaning and Definition – Letter of Credit – Bill of Lading – Certificate of Origin – Export Procedure
V	<b>Recent trends in India's Foreign Trade</b> Future of export and import in India – Planning for exports – Role and functions of World Bank.

**Book for Study:**

1. Balagopal, "Export Management", Himalaya Publishing House, Mumbai, IX Edition-2007

**Book for References:**

1. Chunnawala Patel, , "Export and Import Management", Anmol Publications Pvt Ltd, Chennai. II Edition – 2003.
2. Nand Kishore Sharma, "Import and Export Management", RBSA Publishers, Jaipur, II Edition-2008.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

**Course Outcome ( CO)**

On completion of the course, students should be able to

- Analyze the Basic knowledge about India's recent Trade Policy
- Compare the knowledge about Rate of Exchange and stable vs Fluctuating rate of exchange
- Discuss the payment procedure system followed in foreign exchange market
- Predict the basic documentation and procedures in Export
- Judge the future export in India and role and functions of World Bank

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & Pos
CO1	3	2	1	3		3	3	2	1	2				20
CO2	1	3	3	1	3	2	3	1	3	1	1			22
CO3	2	2	2	2	2	2	2	2	2	2	2			22
CO4	2	2	2	2	1	2	2	2	2	1				18
CO5	2	2	2	2		2	2	2	2	3				19
<b>Grand Total of COs with PSOs and POs</b>														<b>101</b>
<b>Mean Value of COs with PSO and POs(101/50)</b>														<b>2.02</b>

Strong-3, Medium-2 & Low-1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and Pos			<b>2.02</b>
Observation	<b>Cos of EXPORT AND IMPORT MANAGEMENT Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT & M**

**OBE SYLLABUS (From 2023-24 onwards)**

<b>I SEMESTER</b>				
<b>Part</b>	<b>Subject Code</b>	<b>Subject Title</b>	<b>Hours</b>	<b>Credits</b>
I	22UTAL11/ 22UHNL11/ 22USNL11	Tamil/ Hindi/ French	6	4
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream – B	5	4
III	22UITC11	<b>Core – 1</b> Principles of Management	4	4
	22UITC21	<b>Core – 2</b> Programming in C	3	3
	22UITP11	Programming in C - Lab-1	5	3
	22UITA11	<b>Allied -1</b> Digital Principles	5	4
IV	22UFCE11	<b>FC –</b> Personality Development	1	1
	22UCSH12	Communication Skill	1	-
	22UBRC11	Bridge Course		1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NSS/NCC/Phy.Edn./YRC / ROTARACT/AICUF/Nature Club	-	-
<b>Total</b>			<b>30</b>	<b>24</b>
<b>II SEMESTER</b>				
I	22UTAL22/ 22UHNL22/ 22USNL22	Tamil/ Hindi/ French	6	4
II	22UENA22 22UENB22	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream – B	5	4
III	22UITC32	<b>Core – 3</b> Programming in C++	3	3
	22UITC42	<b>Core – 4</b> Data Structures & Algorithms	4	3
	22UITP22	Programming in C++ - Lab - 2	5	3
	22UITA22	<b>Allied – 2</b> Environment of Business	5	4
IV	22UFCH22	<b>FC-</b> Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skill	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NSS/NCC/Phy. Edn./YRC / ROTARACT/AICUF/Nature Club	-	1
<b>Total</b>			<b>30</b>	<b>24</b>

III SEMESTER				
III		Tamil	6	4
	22UITC53	<b>Core – 5</b> Operating Systems	4	3
	22UITC63	<b>Core – 6</b> Web Technology	4	3
	22UITP33	Programming in Web Technology Lab -3	5	3
	22UITA33	<b>Allied – 3</b> Business Accounting	4	4
IV	22UITN13	Basic Tamil / Advanced Tamil / <b>NME-1</b> Image Editing Tools	3	2
	22UITS13	<b>Skill based Elective- 1</b> DBMS	3	2
	22UFCE33	<b>FC-Environmental</b> Studies	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB24	<b>Extension Activities</b> NSS / NCC / Phy.Edn./ YRC /ROTARACT / AICUF /Nature Club	-	-
	22UARE14	ARISE	-	-
		<b>Total</b>	<b>30</b>	<b>22</b>
IV SEMESTER				
I		Tamil	6	4
III	22UITC84	<b>Core – 8</b> Computer Network	4	4
	22UITC94	<b>Core – 9</b> Dot Net Programming	4	2
	22UITP44	Dot Net Programming Lab - 4	5	3
	22UITA44	<b>Allied–4</b> Web Marketing	4	4
IV	22UITN24	Basic Tamil / Advanced Tamil / <b>NME- 2</b> Ethical Hacking	3	2
	22UITS24	<b>Skill based Elective - 2</b> Organizational Behaviour	3	2
	22UFCH44	<b>FC - Religious</b> Literacy and Peace Ethics	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB24	Extension Activities NSS / NCC / Phy.Edn. / YRC /ROTARACT / AICUF /Nature Club		1
	22UARE14	ARISE	-	1
		<b>Total</b>	<b>30</b>	<b>24</b>
V SEMESTER				
	22UITD05	<b>Core - 10</b> Software Engineering	5	4
	22UITD15	<b>Core – 11</b> Research Methodology	5	4
	22UITD25	<b>Core – 12</b> Marketing Management	5	4
	22UITD35	<b>Core – 13</b> Java Programming	5	4

III	22UITP55	Programming in Java Lab - 5	5	4
	22UITE15	<b>Core Elective - 1</b> Human Resource Management	3	3
IV	22UINT15	<b>Internship</b> (Holidays)		1
	22USSI16	Soft Skills	2	
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>VI SEMESTER</b>				
	22UITD46	<b>Core – 14</b> Mobile Application Development	5	4
	22UITP66	Mobile Programming Lab - 6	5	4
	22UITD56	<b>Core – 15</b> Advertising and Salesmanship	5	4
	22UITD66	<b>Core – 16</b> Entrepreneurship Development	5	4
	22UITD76	<b>Core – 17</b> Project	5	4
	22UITE26	<b>Core Elective– 2</b> Internet of Things	3	3
	22USSI16	Soft Skills	2	2
		<b>Total</b>	<b>30</b>	<b>25</b>

Semester	I	II	III	IV	V	VI	TOTAL
Credits	24	24	22	24	24	26	144*

### Non-Major Electives

For Non-Science Students : Image Editing Tools

For Science Students : Ethical Hacker

### Self-Learning Course

Semester	Subject Code	Title of the Paper	Credits
Semester-III	22UITSL3	Scripting Languages	3
Semester-IV	22UITSL4	Stress Management	3
Semester-V	22UITSL5	Cyber Security	3
Semester-VI	22UITSL6	Export and Import Management	3

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF IT & M**

Class : Part : Value Added Course  
 Semester : Hours : 30  
 Subject Code : Credits :

**Office Application Suite**

**Course Educational Objectives (CEO)**

- 1: Practical knowledge about creating, formatting the document
- 2: Practical knowledge about styling your document with images
- 3: Practical knowledge about working with functions and graphically representation
- 4: Practical knowledge about slide presentation
- 5: Practical knowledge about internet and social platforms

**Five Units of the Syllabus**

UNIT	Content	No. of Hours
I	Creating, editing, saving and printing text documents - Font and paragraph formatting - Simple character formatting - Inserting tables, smart art, page breaks	6
II	Using lists and styles - Working with images - Using Spelling and Grammar check - Understanding document properties - Mail Merge	6
III	Spreadsheet basics - Creating, editing, saving and printing spreadsheets - Working with functions & formulas - Graphically representing data : Charts & Graphs - Analyzing data : Data Menu, Subtotal, Filtering Data - Formatting worksheets	6
IV	Opening, viewing, creating, and printing slides - Applying auto layouts - Adding custom animation - Using slide transitions - Charts & Graphs	6
V	Understanding how to search/Google - bookmarking and Going to a specific website - Copy and paste Internet content into your word file and emails - Understanding social media platforms	6

**Book for Study:**

1. "Microsoft Office 365 Bible" by Lisa A. Bucki, John Walkenbach, Michael Alexander, Faithe Wempen, and Dick Kusleika

**Book for Reference:**

1. Office 2019 All-in-One For Dummies" by Peter Weverka

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

**Course Outcome ( CO)**

1. Understand the Concept of Desktop Publishing
2. Applying the knowledge of List & styles
3. Understating the various of Spreadsheets
4. Understating the knowledge on Animation
5. Apply Practical the knowledge on Social Media Platforms

**Course Outcome Level (Preferable one for each objective)**

- CO1 - K<sub>3</sub>  
 CO2 - K<sub>3</sub>  
 CO3 - K<sub>3</sub>  
 CO4 - K<sub>3</sub>  
 CO5 - K<sub>3</sub>

**Mapping Course outcome with**

- i. Programme Specific Objectives - **PSO** (put tick mark in the correlating box)
- ii. Programme Objectives - **PO** (put tick mark in the correlating box)

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & Pos
<b>CO1</b>	3	3	1	1		2	2	2	1					15
<b>CO2</b>	2	2	2	1		2	2	2	2	1				16
<b>CO3</b>	3	3	2	2		2	1			1				14
<b>CO4</b>	3	2	3	1		2	2	2	2	2				19
<b>CO5</b>	2	3	3	2		2	2	2	2					16
<b>Grand Total of COs with PSOs and PO</b>														<b>81</b>
<b>Mean Value of COs with PSO and PO</b>														<b>2.07</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of Cos with PSOs and Pos</b>			<b>2.00</b>
<b>Observation</b>	<b>COs of Office Application Suite Strongly related with PSOs and PO</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF IT & M**

Class	: III Year	Part	: Value Added Course
Semester	: VI	Hours	: 30
Subject Code	:	Credits	:
<b>Managerial Skills for Leaders</b>			

**Course Educational Objectives (CEO)**

- 1: Discuss the basic of Managerial Skills.
- 2: To understand the knowledge of problem solving.
- 3: To gain Knowledge about Interview Skills.
- 4: Discriminate the concepts of team building.
- 5: To understand the concepts of empowerment.

**Five Units of the Syllabus**

Unit	Content	No. of Hours
I	<b>Introduction to Managerial skills &amp;</b> personal skills, Importance of competent managers, skills of effective managers, developing self-awareness on the issues of emotional intelligence, values, attitude towards change, learning of skills and applications of skills.	<b>6</b>
II	<b>Problem solving and building relationship:</b> Problem solving, creativity, innovation, steps of analytical problem solving, limitations of analytical problem solving. Skills development and application for above areas.	<b>6</b>
III	<b>Building relationship Skills</b> for developing positive interpersonal communication, importance of supportive communication, coaching and counseling. Personal interview management. Skill analysis and application on above areas.	<b>6</b>
IV	<b>Team building:</b> Developing teams and team work, advantages of team, leading team, team membership. Skill development and skill application for above areas.	<b>6</b>
V	<b>Empowering and delegating:</b> Meaning of empowerment, dimensions of empowerment, how to develop empowerment, inhibitors of empowerment, delegating works. Skills development and skill application on above areas.	<b>6</b>

**Book for Study:**

- Alex. K. “Managerial Skills” Sultan Chand & Sons Publications, New Delhi.

**Book for Reference:**

- E.H. McGrath S.J “Basic Managerial Skills for All” PHI Learning Private Ltd. New Delhi.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

**Course Outcome ( CO)**

1. Understood the Concept of Managerial Skills.
2. Knowing the various Problem-solving skills.
3. Understand the concepts of Building relationship Skills.
4. Knowing the basic techniques of team building.
5. Understanding the concept of Empowering.

**Course Outcome Level (Preferable one for each objective)**

- CO1 - K<sub>3</sub>  
 CO2 - K<sub>3</sub>  
 CO3 - K<sub>3</sub>  
 CO4 - K<sub>3</sub>  
 CO5 - K<sub>3</sub>

**Mapping Course outcome with**

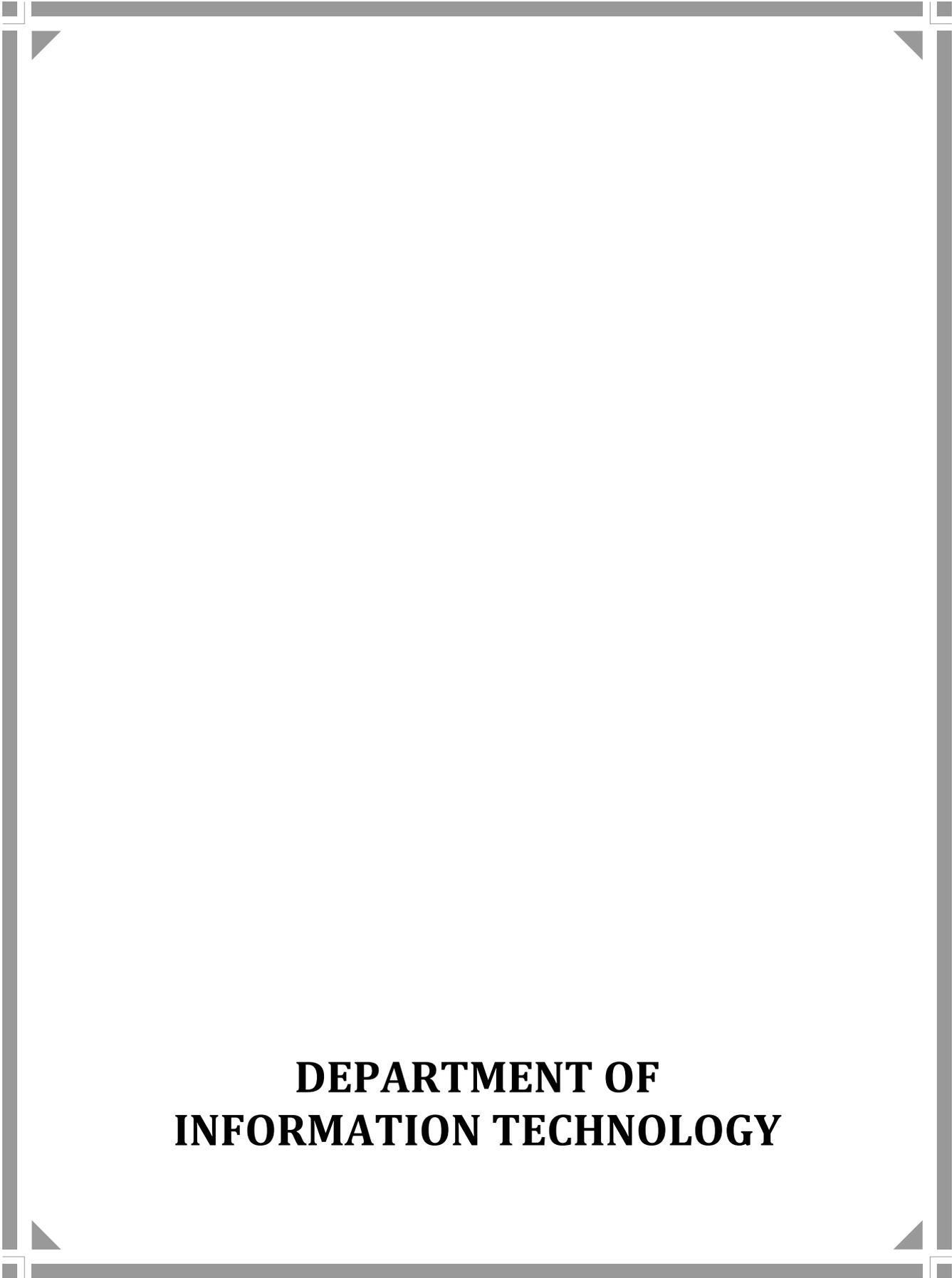
- iii. Programme Specific Objectives - **PSO (put tick mark in the correlating box)**
- iv. Programme Objectives - **PO (put tick mark in the correlating box)**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & Pos
<b>CO1</b>	3	3	1	3		2	2	2	1					17
<b>CO2</b>	2	2	2	2	1	2	2	2	2					17
<b>CO3</b>	3	3	2	2		2	1		2	2				17
<b>CO4</b>	3	2	3	2	1	2	2	2	2	1				20
<b>CO5</b>	2	3	3	2		2	2	2	3	1				20
<b>Grand Total of COs with PSOs and PO</b>														<b>91</b>
<b>Mean Value of COs with PSO and PO</b>														<b>2.07</b>

**Strong-3, Medium-2 & Low-1**

Mapping Scale	1	2	3
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of Cos with PSOs and Pos</b>			<b>2.07</b>
<b>Observation</b>	<b>COs of Managerial Skills for Leaders Strongly related with PSOs and PO</b>		





**DEPARTMENT OF  
INFORMATION TECHNOLOGY**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

(Reaccredited by NAAC with "A" Grade with a CGPA of 3.66)

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**Programme Specific Outcome (PSO)**

1. Learn current techniques and modern tools necessary to develop the software applications.
2. Identify, analyze, formulate and solve technical problems by applying principles of Information Technology to the problem.
3. Take up IT projects and to carry out it as per industry standards.
4. Comprehend and apply the technical solutions in a global and social context.
5. Understand and practice professional, ethical, legal, and social responsibilities as a matured citizen.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF INFORMATION TECHNOLOGY**

**OBE SYLLABUS (From 2024-2025 onwards)**

<b>I SEMESTER</b>				
<b>Part</b>	<b>Subject Code</b>	<b>Subject Title</b>	<b>Hours</b>	<b>Credits</b>
I	23UTAL11/ 23UHNL11/ 23USNL11	Tamil Hindi French	6	4
II	23UENB11	English through Prose & Short Story – Stream B	5	4
III	23UITC11	<b>Core – 1</b> Digital Principles	4	4
	23UITC21	<b>Core – 2</b> Programming in C	3	3
	23UITP11	Programming in C - Lab-1	5	3
	23UITA11	<b>Allied -1</b> Principles of Information Technology	5	4
IV	23UFCE11	<b>FC –</b> Personality Development	1	1
	23UCSH11	Communication Skill	1	-
	23UBRC11	Bridge Course		1
V	23UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn./ YRC /ROTARACT / AICUF / Nature Club	-	-
<b>Total</b>			<b>30</b>	<b>24</b>
<b>II SEMESTER</b>				
I	23UTAL22/ 23UHNL22/ 23USNL22	Tamil Hindi French	6	4
II	23UENB22	English through Prose & Short Story – Stream B	5	4
III	23UITC32	<b>Core – 3</b> Programming in C++	3	3
	23UITC42	<b>Core – 4</b> Data Structures & Algorithms	4	3
	23UITP22	Programing in C++ - Lab - 2	5	3
	23UITA22	<b>Allied – 2</b> Mathematical Foundation	5	4
IV	22UFCH22	<b>FC-</b> Social Responsibility and Global Citizenship	1	1
	22UCSH22	Communication Skill	1	1
V	23UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NSS / NCC / Phy. Edn. / YRC /ROTARACT / AICUF / Nature Club	-	1
<b>Total</b>			<b>30</b>	<b>24</b>
<b>III SEMESTER</b>				
I	23UTAL33/ 23UHNL33/ 23USNL33	Tamil Hindi French	5	4

III	23UITC53	<b>Core – 5 RDBMS</b>	4	3
	23UITC63	<b>Core – 6 Dot Net Programming</b>	4	3
	23UITCP33	Dot Net Programming Lab – 3	5	3
	23UITA33	<b>Allied – 3 Operating Systems</b>	5	4
IV	23UITN13	Basic Tamil / Advanced Tamil / <b>NME-1</b> Image Editing Tools	3	2
	23UITS13	<b>Skill based Elective- 1</b> Cloud Computing	3	2
	23UFCE33	<b>FC-Environmental Studies</b>	1	1
V	23UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	<b>Extension Activities</b> NSS / NCC / Phy.Edn. / YRC /ROTARACT / AICUF /Nature Club	-	-
	23UARE14	ARISE	-	-
<b>Total</b>			<b>30</b>	<b>22</b>
<b>IV SEMESTER</b>				
I	23UTAL44	Tamil	4	4
	23UHNL44	Hindi		
	23USNL44	French		
III	23UITC74	<b>Core – 7</b> Computer Network	5	4
	23UITC84	<b>Core – 8</b> Java Programming	4	2
	23UITP44	Programming in Java Lab – 4	5	3
	23UITA44	<b>Allied–4</b> Operational Research	5	4
IV	23UITN24	Basic Tamil / Advanced Tamil / <b>NME- 2</b> Ethical Hacking	3	2
	23UITS24	<b>Skill based Elective - 2</b> Linux Programming	3	2
	23UFCH44	<b>FC - Religious Literacy and Peace Ethics</b>	1	1
V	23UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn. / YRC /ROTARACT / AICUF /Nature Club		1
	23UARE14	ARISE	-	1
<b>Total</b>			<b>30</b>	<b>24</b>
<b>V SEMESTER</b>				
III	23UITC95	<b>Core - 9</b> Software Engineering	5	4
	23UITD05	<b>Core – 10</b> Artificial Intelligence	5	4
	23UITD15	<b>Core – 11</b> Advanced Java Concepts	5	4
	23UITD25	<b>Core – 12</b> Web Technology	5	4
	23UITP55	Programming in Web Technology Lab -4	5	4
	23UITE15	<b>Core Elective - 1</b> Data Science	3	3

IV	23UINT15	<b>Internship</b> (Holidays)		1
	23USSI16	Soft Skills	2	
		<b>Total</b>	<b>30</b>	<b>24</b>
<b>VI SEMESTER</b>				
	23UITD36	<b>Core – 13</b> Full Stack Development	5	4
	23UITP66	Full Stack Development Lab - 6	5	4
	23UITD46	<b>Core – 14</b> Python Programming	5	4
	23UITD56	<b>Core – 15</b> Cyber Security	5	4
	23UITD66	<b>Core – 16</b> Project	5	4
	23UITE26	<b>Core Elective– 2</b> Internet of Things	3	3
	23USSI16	Soft Skills	2	2
		<b>Total</b>	<b>30</b>	<b>25</b>

Semester	I	II	III	IV	V	VI	TOTAL
<b>Credits</b>	24	24	22	24	24	26	144*

#### **Non-Major Electives**

For Non-Science Students : Image Editing Tools

For Science Students : Ethical Hacker

#### **Self-Learning Course**

Semester	Subject Code	Title of the Paper	Credits
Semester-III		3D Animation	3
Semester-IV		Enterprise Resource Planning	3
Semester-V		Virtual Reality	3
Semester-VI		Scripting Languages	3

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT**

**Class : I IT**

**Part : Core - 1**

**Semester : I**

**Hours : 60**

**Subject Code :**

**Credits : 04**

**DIGITAL PRINCIPLES**

**Course Educational Objectives (CEO)**

- ❖ Understand the basic concepts of Analog & Digital Computers, Evolution of Computer Systems.
- ❖ Impart the knowledge about the Digital Logic Circuits.
- ❖ Analyze and Design the Digital Circuits.
- ❖ Understand the Binary number system and its Conversions.
- ❖ Analyze the Arithmetic circuits and Flip-Flops, Instruction sets, Addressing Mode.

<b>UNIT</b>	<b>Content</b>	<b>No. of Hours</b>
I	<b>Logic Circuits</b> Binary number system – Inverters – OR gates – AND gates – Boolean Algebra – NOR gates – NAND gate.	12
II	<b>Circuit Analysis and Design</b> Boolean Laws and theorem – Sum –of-products method- Truth Table to Karnaugh Map- Pairs, Quads, and Octets – Karnaugh simplifications product of sum method.	12
III	<b>Number System and Codes</b> Binary to decimal conversion – Decimal to Binary Conversion – Octal numbers – Hexadecimal numbers – The ASCII code – The Excess -3 code –Gray code.	12
IV	<b>Arithmetic circuits</b> Binary Addition – Binary subtraction – 2’s complement representation – Arithmetic building blocks – Adder-Subtractor. Flip- Flops: RS Flip Flop – D FlipFlop – JK Flip Flop.	12
V	<b>Instruction set</b> Introduction to Instruction set, Types of Instruction set – RISC, CISC – Register - Addressing modes. Data type Representation: Signed number, Floating point number, Character.	12

**Book for Study:**

1. Donald P leach, Albert Paul Malvino, Goutam Saha, “Digital Principles and Applications”, McGraw-Hill Education, New Delhi, 1993.

**Book for References:**

1. Digital Logic and Computer Design, M.Morris Mano, Pearson Publication, New Delhi, 2017.
2. B.Ram, "Computer Fundamentals – Architecture and Organization", New Age International Publishers, New Delhi, 2018.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

- CO 1: Describe the concepts of Analog & Digital Computers, Evolution of Computer Systems.(k3)
- CO 2: Classify comprehend the Digital Logic Circuits. (k3)
- CO 3: Describe and Analyze the Design of the Digital Circuits. (k3)
- CO 4: Discover the knowledge of the Binary number systems and able to convert the binary numbers as per the requirement. (k3)
- CO 5: Describe about the Arithmetic circuits and Filp-Flops, Instruction sets, Addressing Mode. (k3)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	1	3		3	2	3	1					18
CO2	2	2	3	2	1	2	2	1	3					18
CO3	2	2	3	2		3	1	1	2	1				17
CO4	2	3	2	2	1	2	2	2	3	3				22
CO5	1	3	2	3		3	2	2	2	4				22
<b>Grand Total of COs with PSOs and POs</b>														<b>97</b>
<b>Mean Value of Cos with PSO and POs(97/45)</b>														<b>2.15</b>

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and POs			<b>2.15</b>
Observation	<b>COs of Digital Principles Strongly related with PSOs and POs</b>		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR

DEPARTMENT OF IT

Class : I IT

Part : III Core - 2

Semester : I

Hours : 45

Subject Code :

Credits : 03

PROGRAMMING IN C

Course Educational Objectives (CEO)

- ❖ Understand the concepts of Procedural-Oriented Programming (POP).
- ❖ Impart the knowledge of decision making and control statements in C programming.
- ❖ Develop Generic programming skills by using array concept.
- ❖ Develop the efficient programs using functions.
- ❖ Able to understand and apply the concept of pointers in real time applications.

UNIT	Content	No. of Hours
I	<b>Overview of C</b> Introduction -Importance of C - Basic structure of C program - Character set - C token - keywords and identifiers – constants - variables and data types - Declaration of variables, operators and expression. <b>Managing input and output operators:</b> formatted input and formatted output.	9
II	<b>Decision making and Branching</b> If statement, if else statement, nesting if else statement, switch statement, go to statement. <b>Decision and looping :</b> the while statement, Do statement, for statement.	9
III	<b>Arrays</b> One dimensional array, two dimensional array, multidimensional array. <b>Handling of character String</b> :Declaring and initializing string variables, Reading string, writing string, string handling functions.	9
IV	<b>Functions</b> Library functions, user defined functions, parameters, function calling, call by value, call by reference, Recursion. <b>Structure :</b> Declaring structure, array of structure. <b>Unions</b> :case studies.	9

V	<b>Pointers</b> Pointer declaration, Pointers and arrays. <b>File</b> : opening a file, Closing a file, Input/Output operations on files, getw() – putw() functions, fprintf(), fscanf().	9
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**Book for Study:**

1. E. Balagurusamy, “Programming in ANSI C”, Tata McGraw Hill, New Delhi, 2017.

**Book for References:**

1. Brain W.Kernighan, Dennis M.Ritchie, “ Programming in C Language”, Pearson Education India, New Delhi, 2015.
2. D. Ravichandran, “Programming in C”, New Age Publishers, New Delhi ,2006.
3. Yashavant Kanetkar, Let us C”, 8th Edition, BPB Publications, New Delhi, 2014.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

CO1: Identify the concepts of C programming. (k3)

CO2: Classify the Strong knowledge about the Decision Making and Control Statements in C programming. (k3)

CO3: Convert Write, Compile and Execute the real time programs using C concepts. (k3)

CO4: Classify write the array, functions, pointers and structure programs in C language. (k3)

CO5: Discover the knowledge and write the file operations programs in C language. (k4)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	2	1	3		3	2	3	1					18
<b>CO2</b>	2	2	3	2	1	2	2	1	3					18
<b>CO3</b>	2	2	3	2		3	1	1	2	2				18
<b>CO4</b>	2	3	2	2	1	2	3	2	2	1				20
<b>CO5</b>	3	3	2	3		3	2	2	2	1				21
<b>Grand Total of COs with PSOs and POs</b>														<b>95</b>
<b>Mean Value of Cos with PSO and POs(95/45)</b>														<b>2.11</b>

\*: S-Strong; M-Medium; L-Low

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of Cos with PSOs and POs</b>			<b>2.11</b>
<b>Observation</b>	<b>COs of Programming in C Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF IT**

**Class** : I IT **Part** : III Core Lab - 1  
**Semester** : I **Hours** : 75  
**Sub code** : **Credits** : 03

**PROGRAMMING IN C LAB**

**Course Educational Objectives (CEO)**

- ❖ Understand the concepts of Procedural-Oriented Programming (POP).
- ❖ Impart the knowledge of decision making and control statements in C programming.
- ❖ Develop Generic programming skills by using array concept.
- ❖ Develop the efficient programs using functions.
- ❖ Able to understand and apply the concept of pointers in real time applications.

UNIT	Content	No. of Hours
I	Tokens, Data-types, Variables and Operators	15
II	Using Decision making and Branching Statements	15
III	Using Arrays and Strings	15
IV	Using Functions. Write a C Program using Call by Value – Call by Reference	15
V	Program Using Pointers and File	15

**Book for Study:**

1. E. Balagurusamy, "Programming in ANSI C", Tata McGraw Hill, New Delhi, 2017.

**Book for References:**

1. Brain W.Kernighan, Dennis M.Ritchie, " Programming in C Language", Pearson Education India, New Delhi, 2015.
2. D. Ravichandran, "Programming in C", New Age Publishers, New Delhi ,2006.
3. Yashavant Kanetkar, Let us C", 8th Edition, BPB Publications, New Delhi, 2014.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

CO1: Identify the concepts of C programming. (k3)

CO2: Classify the Strong knowledge about the Decision Making and Control Statements in C programming. (k3)

CO3: Convert Write, Compile and Execute the real time programs using C concepts. (k3)

CO4: Classify write the array, functions, pointers and structure programs in C language. (k4)

CO5: Discover the knowledge and write the file operations programs in C language. (k5)

### Mapping Course outcome

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	2	3	3		3	3	3						20
<b>CO2</b>	2	3	3	3	1	2	2	2	3					21
<b>CO3</b>	3	2		2	3	3	2	2	3					20
<b>CO4</b>	2	3	2	3	3	2	3	2						20
<b>CO5</b>	3	2	2	3	2	3	2	2	3					22
<b>Grand Total of COs with PSOs and POs</b>														<b>103</b>
<b>Mean Value of Cos with PSO and POs (103/41)</b>														<b>2.51</b>

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and POs			<b>2.51</b>
Observation	<b>COs of Programming in C Lab-1 Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT**

**Class : I IT**

**Part : Allied - 1**

**Semester : I**

**Hours : 75**

**Subject Code :**

**Credits : 04**

**Principles of Information Technology**

**Course Educational Objectives (CEO)**

- ❖ Understand the knowledge about Information Technology.
- ❖ Understand the basic concepts of Analog & Digital Computers, Evolution of Computer Systems.
- ❖ Impart the knowledge about the software types.
- ❖ Understand the basic internet concepts.
- ❖ Understand the basic internet concepts.

<b>UNIT</b>	<b>Content</b>	<b>No. of Hours</b>
I	<b>Information Technology:</b> Introduction – Information systems – Definition of computer and system – Software and Data - IT in business and Industry – IT in the Home and at Play – It in Education and Training – IT in Entertainment and the Arts – IT in Science, Engineering, and Mathematics – Global Positioning System(GPS).	15
II	<b>Introduction to Digital Computers</b> Evolution of Digital Computers, Digital and Analog Computers – Classification of Digital Computers - Computer Generations - Major components of a Digital computer, Memory Types.	15
III	<b>Software:</b> Introduction to Software - Kinds of Software: Application Software, System Software, Embedded Software. The types of Applications software - Word processing – Spreadsheets - Database software, Presentation graphics software - Communications software- Operating system.	15
IV	<b>Basic Internet Concepts</b> What is Internet – A brief history of Internet -Intranet-Modems - ISDN lines, and Cable Modems - The World Wide Web - Browsing the web – Web browser – Uniform Resource Locator (URL) – E-mail communication.	15
V	<b>Networking</b> Introduction –Networks - Types of Networks: LAN, WAN, MAN – firewalls - Network Topology: Bus, Ring, Hybrid, Star. Internet address - Domain Name System (DNS) – Search Engines – Chatting and conferencing on the Internet Online Chatting – Messaging.	15

**Book for Study:**

1. Thomas C. Bartee, "Digital Computer Fundamentals" McGraw Hill Education, New Delhi, 2001
2. B. Ram, "Computer Fundamentals – Architecture and Organization", New Age International Publishers, New Delhi, 2018.

**Book for References:**

1. Donald P. Leach, Albert Paul Malvino, Goutam Saha, "Digital Principles and Applications", 8<sup>th</sup> edition, McGraw-Hill Education, New Delhi, 2014.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

- CO 1: Describe the concepts of Information Technology & Systems (k3)  
 CO 2: Describe the concepts of Analog & Digital Computers, Evolution of Computer Systems. (k3)  
 CO 3: Describe the software types. (k3)  
 CO 4: Learn to use Internet (k4)  
 CO 5: Describe the Concepts of Networks (k4)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	1	3		3	2	3	1					18
CO2	2	2	3	2	1	2	2	1	3					18
CO3	2	2	3	2		3	1	1	2	2				18
CO4	2	3	2	2	1	2	3	2	2	1				20
CO5	3	3	2	3		3	2	2	2	1				21
<b>Grand Total of COs with PSOs and POs</b>														<b>95</b>
<b>Mean Value of Cos with PSO and POs(95/45)</b>														<b>2.11</b>

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and POs			<b>2.11</b>
Observation	<b>COs of Principles of Information technology Strongly related with PSOs and POs</b>		



**Book for Study:**

1. E. Balagurusamy, "Object Oriented Programming with C++", Tata McGraw Hill, New Delhi, 2014.

**Books for References:**

1. D. Ravichandran, "Programming with C++", Tata McGraw Hill, New Delhi, 2017.
2. Herbert Schildt, "C++: The Complete Reference", Tata McGraw Hill, New Delhi, 2017.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

- 1: Distinguish the POP and OOPs concepts. (k3)
- 2: Discover knowledge about the C++ Features. (k3)
- 3: Classify Write, Compile and Execute and programs using C++ OOPs concepts. (k3)
- 4: Defend write the reusability codes by using Inheritance. (k3)
- 5: Convert apply the OOPS concepts in real time applications. (k3)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	2	1	3		3	2	3	1					18
<b>CO2</b>	2	2	3	2	1	2	3	1	2					18
<b>CO3</b>	1	2	2	3	2	3	1	2	3	2				21
<b>CO4</b>	2	3	2	2	1	3	3	2	3	1				22
<b>CO5</b>	3	2	3	3	3	2	1	2	2					21
<b>Grand Total of COs with PSOs and POs</b>														<b>100</b>
<b>Mean Value of Cos with PSO and POs(100/46)</b>														<b>2.17</b>

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of Cos with PSOs and POs</b>			<b>2.17</b>
<b>Observation</b>	<b>Cos of PROGRAMMING IN C++ Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT**

<b>Class</b>	<b>: I IT</b>	<b>Part</b>	<b>: III Core Lab -2</b>
<b>Semester</b>	<b>: II</b>	<b>Hours</b>	<b>: 75</b>
<b>Sub code</b>	<b>:</b>	<b>Credits</b>	<b>: 03</b>

**PROGRAMMING IN C++ LAB**

**Course Educational Objectives (CEO)**

- ❖ Understand difference between Procedural-Oriented Programming (POP) and Object-Oriented Programming (OOP) concepts.
- ❖ Able to apply the object oriented features.
- ❖ Develop Generic programming skills using OOPS concepts.
- ❖ Develop the efficient programs using Class and Inheritance.
- ❖ Able to understand and apply the concept of Polymorphism in real time applications.

<b>UNIT</b>	<b>Content</b>	<b>No. of Hours</b>
I	Program Using OOPs Concept	15
II	Program Using Variables, Program Control Structures, using Pointers –Functions – Function & Operator Overloading	15
III	using Class & Objects, – Constructors and Destructors, Array of Objects	15
IV	Using Inheritance - Types	15
V	Virtual Functions – Polymorphism	15

**Book for Study:**

1. E. Balagurusamy, "Object Oriented Programming with C++", Tata McGraw Hill, New Delhi, 2014.

**Books for Reference:**

1. D. Ravichandran, "Programming with C++", Tata McGraw Hill, New Delhi, 2017.
2. Herbert Schildt, "C++: The Complete Reference", Tata McGraw Hill, New Delhi, 2017.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

### Course Outcome (CO)

On completion of the course, students should be able to

CO 1: Distinguish the POP and OOPs concepts. (k3)

CO 2: Discover knowledge about the C++ Features. (k3)

CO 3: Classify Write, Compile and Execute and programs using C++ OOPs concepts.(k3)

CO 4: Defend write the reusability codes by using Inheritance. (k4)

CO 5: Convert apply the OOPS concepts in real time applications. (k5)

### Mapping Course outcome

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	3	2	3		3	2	3	2	1				22
<b>CO2</b>	2	3	3	2	2	2	3	2	3					22
<b>CO3</b>	3	2	2	3	2	3	2	2	3	2				24
<b>CO4</b>	2	3	3	2	3	3	3	3	2	2				26
<b>CO5</b>	3	2	3	3	3	2	2	3	3	2				26
<b>Grand Total of COs with PSOs and POs</b>														<b>120</b>
<b>Mean Value of Cos with PSO and POs(120/48)</b>														<b>2.5</b>

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of Cos with PSOs and POs</b>			<b>2.5</b>
<b>Observation</b>	<b>Cos of PROGRAMMING IN C++ Lab Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT**

**Class : I IT**

**Part : Core - 4**

**Semester : II**

**Hours : 60**

**Subject Code :**

**Credits : 03**

**DATA STRUCTURES AND ALGORITHMS**

**Course Educational Objectives (CEO)**

- ❖ Understand the basic concepts about Stack and Queue.
- ❖ Impart the knowledge of the Lists and its types.
- ❖ Know the important concepts of Trees.
- ❖ Able to develop an Algorithm for real time applications.
- ❖ Able to understand and apply the various types of Computer Algorithms in real time problems.

<b>UNIT</b>	<b>Content</b>	<b>No. of Hours</b>
I	<b>Introduction on Data Structures &amp; Algorithms</b> Introduction– Algorithms – Specification – Performance Analysis. <b>Arrays:</b> Ordered Lists - Representation of arrays. Stacks and Queues fundamentals-evaluation of expressions-multiple stacks and queues.	12
II	<b>Linked Lists</b> Singly Linked Lists- Linked stacks and queues- The Storage Pool - Polynomial Addition- More on Linked Lists. Doubly Linked Lists: Node Insertion and Node Deletion.	12
III	<b>Trees</b> Basic terminology-Binary trees-Binary tree Representations - Binary tree traversal. Threaded Binary Trees- Binary Tree Representation of Trees.	12
IV	<b>The Complete Development of an Algorithm</b> Algorithms – Basic Steps. Algorithm Design Methods: Sub goals – Hill Climbing – Working Backward – Heuristics – Backtrack Programming – Recursion.	12
V	<b>Computer Algorithms</b> Sorting – Searching – Parallelism. Mathematical Algorithms Magic Squares.	12

**Book for Study:**

1. Ellis Horowitz and Sartaj Sahni, "Fundamentals of Data structures", Galgotia Publications, New Delhi, 1985.
2. S.E. Goodman and S.T. Hedetniemi, "Introduction to the Design and Analysis of Algorithms", McGraw Hill, International , New Delhi, 1988.

**Book for References:**

1. Tanenbaum A.M. and Augustein M.J, "Data Structures with Pascal", Prentice Hall of India Limited, New Delhi, 1985.
2. Yashavant Kanetkar, "Data Structures Through C", BPB Publications, New Delhi, 2010.

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

CO 1: Identify the Data Structure Fundamentals and Stack, Queues concepts. (k3)

CO 2: Generalized the functionalities of different Linked Lists. (k3)

CO 3: Convert and compare the Operations of Tree Structure. (k3)

CO 4: Classify data structures concepts to designing an algorithms. (k4)

CO 5: Locate and compare the various types computer algorithms. (k4)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
<b>CO1</b>	3	3	1	2	1	2	3	2	1					18
<b>CO2</b>	2	2	2	3	1	3	1	2	2					18
<b>CO3</b>	1	3	2	3		2	1	2	1	3				18
<b>CO4</b>	2	3	2	3	1	3	2	2	1	1				20
<b>CO5</b>	3	3	3	2		3	2	2	1	1				20
<b>Grand Total of COs with PSOs and POs</b>														<b>94</b>
<b>Mean Value of Cos with PSO and POs(94/46)</b>														<b>2.04</b>

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
<b>Relation</b>	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
<b>Quality</b>	Low	Medium	Strong
<b>Mean value of Cos with PSOs and POs</b>			<b>2.04</b>
<b>Observation</b>	<b>Cos of DATA STRUCTURES AND ALGORITHMS Strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF IT**

**Class : I IT**

**Part : Allied - 2**

**Semester : II**

**Hours : 75**

**Subject Code :**

**Credits : 4**

**MATHEMATICAL FOUNDATION**

**Course Educational Objectives (CEO)**

- i. Understand the Basic structure of sets, functions.
- ii. Impart the knowledge of Number Theory.
- iii. Able to learn permutations, combinations.
- iv. Understand the Discrete probability, Relations.
- v. Able to learn Graphs, Boolean Algebra.

UNIT	Content	No. of Hours
I	Basic Structures: Sets, Functions, Sequences, Sums, and Matrices : Sets - Set Operations -Functions - Sequences and Summations - Cardinality of Sets - Matrices	15
II	Number Theory and Cryptography Divisibility and Modular Arithmetic - Integer Representations and Algorithms - Primes and Greatest Common Divisors - Solving Congruences - Applications of Congruences - Cryptography .	15
III	Counting The Basics of Counting - The Pigeonhole Principle - Permutations and Combinations - Binomial Coefficients and Identities -Generalized Permutations and Combinations - Generating Permutations and Combinations.	15
IV	Discrete Probability, Relations An Introduction to Discrete Probability-Probability Theory-Bayes' Theorem-Expected Value and Variance. Relations and Their Properties-n-ary Relations and Their Applications-Representing Relations	15
V	Graphs, Boolean Algebra Graphs and Graph Models -Graph Terminology and Special Types of Graphs -Representing Graphs and Graph Isomorphism -Connectivity. Boolean Functions-Representing Boolean Functions-Logic Gates	15

**Book for Study:**

1. Kenneth H. Rosen "DISCRETE MATHEMATICS AND ITS APPLICATIONS", SEVENTH EDITION Published by McGraw-Hill

**Books for References:**

1. Richard Johnsonbaugh "DISCRETE MATHEMATICS"– Eighth edition, Copyright @ 2018, by Pearson Education, Inc

**Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

**Course Outcome (CO)**

On completion of the course, students should be able to

CO1: Describe the Basic structure of sets, functions. (k3)

CO2: Discover the knowledge about knowledge of Number Theory (k3)

CO3: Using the concepts permutations, combinations(k3)

CO4: Known the concepts of Discrete Probability, Relations(k3)

CO5: Known the concepts of Graphs, Boolean Algebra(k4)

**Mapping Course outcome**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	3	2	1		3	3	3	1					19
CO2	2	2	3	2	2	3	1	2	3					20
CO3	3	2	2	3		2	2	2	3	3				22
CO4	2	3	3	3	1	2	2	2	1	1				20
CO5	3	2	3	2	2	3	2	2	2	1				22
<b>Grand Total of COs with PSOs and POs</b>														<b>103</b>
<b>Mean Value of Cos with PSO and POs(103/46)</b>														<b>2.24</b>

\*: S-Strong; M-Medium; L-Low

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean value of Cos with PSOs and POs			<b>2.24</b>
Observation	<b>Cos of Mathematical Foundation Strongly related with PSOs and Pos</b>		



**DEPARTMENT OF PHYSICAL EDUCATION**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF PHYSICAL EDUCATION**  
**OUTCOME BASED EDUCATION**

**PROGRAMME SPECIFIC OBJECTIVES (PSO)**

**PSO – 1**

To acquire the knowledge of Physical Education in the domain of practicing, coaching, teaching, training and maintaining healthy life style.

**PSO – 2**

To understand the field where new skills to be acquired, using latest equipment, techniques and rules and regulations.

**PSO – 3**

To apply the techniques and tactics in game situations.

**PSO – 4**

To analyzes the relationship between fitness components and performance variables.

**PSO – 5**

To test and evaluate the behavior of the players, spectators, coaches, trainers and officials.

**ARULANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

Part	Subject Code	Paper	Hours	Credit
<b>I SEMESTER</b>				
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil / Hindi / French	06	04
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream – A English through Prose & Short Story – Stream – B	05	04
III	22UPEC11	Core – I : Theories of Games - I	05	03
	22UPEP11	Practical: Games - I	04	02
	22UPEA11	Allied – I : Foundation of Physical Education	05	04
IV	22USBE11	SBE – I Office Automation and Design	03	02
	22USBP11	SBE – I Office Automation and Design - Lab		
	22UFCE11	FC – Personality Development	01	01
	22UBRC11	Bridge Course	-	01
	22UCSH12	Communication Skill	01	-
V	22UNCC/ NSS/ PHY.EDU./YRC/ ROT/ACF/ NCB12	Extension Activities NCC/NSS/Phy.Edn. /YRC/ ROTARACT/AICUF/Nature Club	-	-
			<b>30</b>	<b>21</b>
<b>II SEMESTER</b>				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil / Hindi / French	06	04
II	22UENG22	English through Prose & Poetry	05	04
III	22UPEC22	Core – II : Theories of Games - II	05	04
	22UPEP22	Practical: Games - II	04	04
	22UPEA22	Allied-II : Human Anatomy & Physiology	05	04
IV	22USYE22	SBE – II Internet and Web Design	03	02
	22USYP22	SBE – II Internet and Web Design - Lab		
	22UFCH22	FC – Social Responsibility and Global Citizenship	01	01
	22UCSH12	Communication Skill	01	01
V	22UNCC/ NSS/ PHY.EDU./YRC/ ROT/ACF/ NCB12	Extension Activities NCC/NSS/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	-	01
			<b>30</b>	<b>25</b>
<b>III SEMESTER</b>				
I	22UTAL33/ 22UHNL33/ 22UFNL33	Tamil / Hindi / French	06	04

II	22UENG33	English through Literature – I	06	04
III	22UPEC33	Core – III: Theories of Games - III	05	03
	22UPEP33	Practical: Games - III	04	03
	22UPEA33	Allied – III: Track & Combined Events	03	02
	22UPEQ13	Practical: Track & Combined Events	02	02
IV	22UPEN13	NME – 1: Fitness and Wellness	03	02
	22UFCE33	FC – Environmental Studies	01	01
V	22UNCC/ NSS/ PHY.EDU./YRC/ ROT/ACF/ NCB24	Extension Activities NCC/NSS/Phy.Edn. /YRC/ ROTARACT/AICUF/Nature Club	-	-
	22UARE14	ARISE	-	-
			<b>30</b>	<b>21</b>
<b>IV SEMESTER</b>				
I	22UTAL44/ 22UHNL44/ 22UFNL44	Tamil / Hindi / French	06	04
II	22UENG44	English through Literature – II	06	04
III	22UPEC44	Core - IV : Theories of Game - IV	05	05
	22UPEP44	Practical: Game IV	04	04
	22UPEA44	Allied - IV : Field Events	03	02
	22UPEQ24	Practical: Field Events	02	02
IV	22UPEN24	NME – 2: Fundamentals of yoga	03	02
	22UFCH44	FC - Religious Literacy and Peace Ethics	01	01
V	22UNCC/ NSS/ PHY.EDU./YRC/ ROT/ACF/ NCB24	Extension Activities NCC/NSS/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	-	01
	22UARE14	ARISE	-	01
			<b>30</b>	<b>26</b>
<b>V SEMESTER</b>				
III	22UPEC55	Core– V : Research Methodology & Statistics in Physical Education	05	04
	22UPEC65	Core - VI : Science of Sports Training	05	04
	22UPEC75	Core - VII : Methods in Physical Education	05	04
	22UPEC85	Core – VIII: Test, Measurement & Evaluation in Physical Education	03	02
IV	22UPEP55	Practical: Test, Measurement & Evaluation in Physical Education	02	02
	22UPEP65	Practical - Teaching Practice	05	03
	22UPEE15	Core Elective 1A: Exercise Physiology	03	03
		Core Elective 1B : Sports Journalism		
IV	22UINT15	Internship	-	01
	22USSI16	Soft Skills	02	-
			<b>30</b>	<b>23</b>

VI SEMESTER				
III	22UPEC96	Core – IX : Kinesiology and Biomechanics in Physical Education	05	04
	22UPED06	Core – X: Sports Management	05	04
	22UPED16	Core - XI : Games of Specialization	03	03
	22UPEP76	Practical: Games of Specialization	03	03
	22UPED26	Core – XII : Yoga for Fitness	03	03
	22UPEP86	Practical: Yoga for Fitness	03	03
	22UPED36	Core – XIII : Project	03	03
	22UPEE26	Core Elective–2 A : Sports Medicine & First Aid	03	03
	Core Elective–2 B : Sports Psychology & Sociology			
IV	22USSI16	Soft Skills	02	02
			<b>30</b>	<b>28</b>

Semester		I	II	III	IV	V	VI	Total
Credits	21	25	21	26	23	28	144	

**Part – I** **16 Credits**

**Part – II** **16 Credits**

**Part – III**

Core 72 Credits

Allied 16 Credits

Core Elective 06 Credits

**Total 94 Credits**

**Part –IV**

Non –Major Elective 04 Credits

Skill Based Elective 04 Credits

Foundation Course 04 Credits

**Total 12 Credits**

**Part – V Extension 02 Credits**

**Others**

Bridge Course 01 Credit

Soft Skill 02 Credits

Communicative Skill 01 Credit

ARISE 01 Credit

Internship 01 Credit

**Total 06 Credits**

**Grant Total 144 Credits**

### Self-Learning Courses - Additional Credits

Semester	Sub. Code	Title of the Paper	Credits
III	22UPESL3	Modern Trends in Physical Education	3
IV	22UPESL4	Health Education	3
V	22UPESL5	Olympic Movement	3
VI	22UPESL6	Sports Nutrition	3

### PRACTICAL EVALUATION

#### Internal Examination- 50 Marks

S.No	Components	Marks
01	Regular Activities	15
02	Skill Demonstration	20
03	Playing Ability	15
	<b>Marks</b>	<b>50</b>

#### External Examination – 50 Marks

S.No	Components	Marks
01	Record Note	10
02	Skill Demonstration	10
03	Playing Ability	10
04	Viva	10
05	Officiating & Coaching	10
	<b>Marks</b>	<b>50</b>

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF PHYSICAL EDUCATION**  
**OUTCOME BASED**

**EDUCATION PROGRAMME SPECIFIC OUTCOME (PSO)**

**PSO – 1**

Determine knowledge on Physical Education in the domain of practicing, coaching, teaching, training and maintaining healthy life style.

**PSO – 2**

Understand the field where new skills to be acquired, using latest equipment, techniques and rules and regulations.

**PSO – 3**

Analyze the techniques and tactics in game situations.

**PSO – 4**

Understand the relationship between fitness components and performance variables.

**PSO – 5**

Analyze the behavior of the players, spectators, coaches, trainers and officials.

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 2023)**

<b>Title (Core – V)</b>	<b>Research Methodology &amp; Statistics in Physical Education</b>	<b>Course Code</b>	<b>22UPEC55</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>75</b>
<b>Semester</b>	<b>V</b>	<b>Credit</b>	<b>04</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To understand the concept of Research.</li> <li>• To know the various types of research.</li> <li>• To identify various sources of information review for data information /To enable to write the research Proposal</li> <li>• To introduce the statistical tools for research.</li> <li>• To able to correlate the related things</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Meaning - Definition of Research - Nature and Characteristics of Research - Need and Importance of Research in Physical Education - Criteria in selecting the Research problem.	15	
II	Types of Research - Basic Research, Applied Research, Action Research – Hypothesis, Types of Hypothesis - Experimental Research, Nature and Meaning - Experimental Variables - Historical Research – Steps – Sources – Criticism.	15	
III	Preparation of Research Report - Research Proposal-Introduction, Review, Methodology, Bibliography – Abstract - Introduction, Main Body of Report, Conclusion - Organization of thesis report - Mechanism of writing footnote and bibliography.	15	
IV	Statistics – Meaning -Types – Need and Importance Statistics in Physical Education- Constructing a Frequency Table, Range of Scores, Number of Intervals, Size of Interval – Tabulation– Frequency Polygon – Histogram.	15	
V	Measures of Central Tendency – Mean, Median and Mode - Measures of Variability- Range, Standard Deviation- Correlation with Ungrouped data- t-ratio.	15	
<b>Books for Study</b>	1. Dr. Suresh Kutty K., 2015, “Research Methods in Physical Education” Sports Publication, New Delhi.		
<b>Books for Reference</b>	1. Clarke, David H and H .Harrison Clarke, 2005, “Research Process in Physical Education”, Inded Prentice, Inc., New Jersey. 2. Rothstein, Anne, L. Research Design & Statistics for Physical Education. 3. Moses, R. Amritta Kumar. Thesis Writing Format, Madras, Poompugar Pathipagam, 1995. 4. Kothari C.R. Research Methodology, New Delhi: Wiley Fasern Ltd. 2000.		

**Teaching and learning methods**

- Lecture Method, Group Discussion, Assignment.

### Course Outcome (CO)

On successful completion of the course, the students will be able to

**CO 1:** Explain the concept of Research in physical Education. **(K2)**

**CO 2:** Classify of various research methodologies. **(K2)**

**CO 3:** Construct research report and Research proposal. **(K3)**

**CO 4:** Interpret the meaning and definition of statistics. **(K2)**

**CO 5:** Apply the of statistics tool in research. **(K3)**

### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3		2	2		3	3			3	2	3		21
CO 2	3		3	3		3	2			3	2	3		22
CO 3	3		3	3		3	2			3	2	3		22
CO 4	3		3	3		1	2			3	2	3		20
CO 5	3		3	3		1	2			3	3	3		21
<b>Grand Total of COs with PSOs and Pos</b>														<b>106</b>
<b>Mean Value of COs with PSO and POs = 106/40</b>														<b>2.65</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.65</b>
Observation	<b>COs of Research Methodology &amp; Statistics in Physical Education strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Core – VI)</b>	<b>Science of Sports Training</b>	<b>Course Code</b>	<b>22UPEC65</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>75</b>
<b>Semester</b>	<b>V</b>	<b>Credit</b>	<b>04</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To understand the fundamental concepts of sports training.</li> <li>• To know the methods of developing the motor qualities.</li> <li>• To cultivate the concepts of flexibility and speed in training.</li> <li>• To able to design plan for effective training.</li> <li>• To Prepare the sports person for the competition</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Sports Training – Introduction – Meaning – Aim– Characteristics -Principles of Sports Training.	15	
II	Training of Motor Qualities: Strength: Forms of Strength – Characteristic of Strength –Strength Training – Methods of Strength improvement Endurance: Forms of Endurance – Characteristics of Endurance – Endurance Training – Methods of Endurance improvement	15	
III	Flexibility: Types of Flexibility -Mean and Methods for developing flexibility Speed: Forms of Speed – Speed Training – Means and Methods for developing Speed	15	
IV	Planning – Meaning and Definition - Principles of planning-Types- Short term plan, Long Term Plans – Periodisation – Single periodisation- Double periodization – Macrocycle, Mesocycle and Microcycle	15	
V	Types of Training – Interval Training, Circuit Training, Plyometric Training, Weight Training, Fartlek Training, Continuous Training, and Resistance Training	15	
<b>Books for Study</b>	1. K.Uppal., “Sports Training” Friends publication, New Delhi, 2005.		
<b>Books for Reference</b>	1. Mishra S. C., “Sports Training”, Sports Publication, Chennai, 2009. 2. Kawade, R. R., “Sports Training” Sports Publications, Chennai, 2013. 3. Arvind, B., Qureshi and Dabir, “Encyclopedia of Sports Training”, Sports Publications, Chennai, 2012. 4. Choudhari and Sanjay.T., “Essential of Strength Training and Conditioning,” KhelSahithya Kendra, New Delhi, 2013. 5. Sebastian. P.J., “System of Sports Training”, Friends Publications, Chennai, 2013.		

### Teaching and learning methods

- Class Lecture, Demonstration, ICT, Video observation, Assignments.

### Course Outcome (CO)

**On successful completion of the course, the students able to**

**CO 1:** Summarize the fundamental concepts of sports training.

**(K1)CO 2:** Identify the strength and Endurance of players. **(K3)**

**CO 3:** Evaluate the speed and Flexibility in the performance of stakeholders.

**(K4)CO 4:** Develop excellent training plans. **(K3)**

**CO 5:** Classify the types of training.

**(K2)**

### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3	3	2			3	3	2		3		1		20
CO 2	3	3	2			3	3	2		3		2		21
CO 3	3	3	2			3	3	2		3		2		21
CO 4	3	3	2			3	3	3		3		3		23
CO 5	3	3	2			3	3	3		3		2		22
<b>Grand Total of COs with PSOs and Pos</b>														<b>107</b>
<b>Mean Value of COs with PSO and POs = 101/40</b>														<b>2.67</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.67</b>
Observation	<b>COs of General Theory and Methods of Training strongly related with PSOs and Pos</b>		

**ARULANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514**  
**DEPARTMENT OF PHYSICAL EDUCATION**

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)

<b>Title (Core – VII)</b>	<b>Methods in Physical Education</b>	<b>Course Code</b>	<b>22UPEC75</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>75</b>
<b>Semester</b>	<b>V</b>	<b>Credit</b>	<b>04</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To familiarize the Subject matter and Scientific Principles of method of physical education</li> <li>• To aware the Aids of Physical education</li> <li>• To Know about the class room management in Physical education</li> <li>• To distinguish between Intramural and Extramural competitions</li> <li>• To apply the games rules and organize Tournaments</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Methods: Meaning – Factors – Subject Matter – Past experience of the Pupils – Situation – Time and Material at the disposal of the teacher – Scientific Principles - Presentation Techniques: Personal and Technical Preparation.	15	
II	Methods of Teaching: Introduction, Different methods of teaching physical activities, Teaching Aids - Meaning, Purpose and criteria for audio visual aids, Types of audio-visual aids.	15	
III	Class management: Introduction, Principles of class management, Factor influencing class management, Steps in class management, Principles of lesson plan, Types of lesson plan, Advantages of lesson plan.	15	
IV	Intramural & Extramural Competition: Intramural - Introduction, Meaning and Objectives - Advantages of intramural activities- Organization of intramurals. Extramural- Introduction, Meaning and Objectives of extramural activities, Principles of inter institutional competition, Types of incentives and awards in physical education	15	
V	Tournaments – Definition - Types of Tournaments – Single knock out – Seeding – Special Seeding – Merits and Demerits of Single knock out Tournament – League Tournaments – Types of League Tournaments – Cyclic– Staircase Method – Merits and Demerits of League Tournaments.	15	
<b>Book for study</b>	1. Dr. M. L. Kamalesh, “ <b>Methods in Physical Education</b> ”, Friends Publications, New Delhi, 2012.		

<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Rajesh Tripathi, <i>“Methods of Physical Education”</i>, Sports Publication, New Delhi. 2010</li> <li>2. Saket Raman Tiwari, Chhotelalrathor and Yogesh Kumar Singh, <i>“Teaching Methods in Physical Education”</i> Surjeet Publications, New Delhi. 2012.</li> <li>3. Shunmuruganath. K. <i>“Methods of Administration and Organisation in Physical Education”</i> Lakshay Publication, New Delhi, 2012.</li> <li>4. Katherine T. Thomas, Amelia M. Lee and Jerry R. Thomas, <i>“Physical Education Methods for Elementary Teachers”</i> Forth Ed., USA. 2012.</li> </ol>
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**Teaching and learning methods**

□ Class Lecture, Video Clippings, Diagrams, Demonstration, ICT (Informationcommunication Technology)

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

**CO 1:** Define the meaning and the factors of methods in physical education. **(K-1)**

**CO 2:** Illustrate the importance of class management and teaching aids. **(K-2)**

**CO 3:** Conduct the intramural and extramural tournaments. **(K-3)**

**CO 4:** Create the lesson plan for the physical education students **(K-5)**

**CO 5:** Draw the fixtures of various tournaments. **(K-2)**

**Mapping Course outcome with**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3					3	3	3		3	2			17
CO 2	3					3	3	2		2	1			14
CO 3	3					3	3	3		3	3	3		21
CO 4	3	3			3	3	3	3		3	2			23
CO 5	3	2				3	3	2		2	3	2		20
<b>Grand Total of COs with PSOs and Pos</b>														<b>95</b>
<b>Mean Value of COs with PSO and POs = 95/35</b>														<b>2.71</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.71</b>
Observation	<b>COs of Methods in Physical Education strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Core – VIII)</b>	<b>Test, Measurement and Evaluation in Physical Education</b>	<b>Course Code</b>	<b>22UPEC85</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>45</b>
<b>Semester</b>	<b>V</b>	<b>Credit</b>	<b>02</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To understand the concept of test , measurement and Evaluation</li> <li>• To know the criteria of good test.</li> <li>• To gain the profound knowledge of components in physical fitness.</li> <li>• To provide the thorough knowledge on testing for physical fitness.</li> <li>• To able to evaluate the standardized skills in some major games.</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Meaning of Test, Measurement and Evaluation – Need and Importance of test, Measurement and Evaluation, Classification of Test – Standardized and Teacher Made Test – Objective and Subjective Tests – contribution of Knowledge Test and Skill Test	9	
II	Criteria of Good test – Validity – Reliability – Objectivity – Norms – Administration Feasibility – Educational Application	9	
III	<b>Physical Fitness Components Test</b> Speed – 40 yards, 60 yards Strength – Hand Grip Strength Test, Push Ups Endurance- Cooper’s 12min Run/walk, Harvard Step test. Agility - T -Test, 4X10 yards shuttle run Flexibility – Sit and Reach Test, Vertical Jump.	9	
IV	<b>FITNESS TEST:</b> AAHPRED Youth Fitness Test Kraus Weber Test Johnson Motor Educability Test BMI (Body Mass Index) SDAT Test	9	
V	<b>SKILL TESTS :</b> 1. Johnson Basketball Test 2. Friedel Field Hockey Test 3. Helman Volleyball Test 4. Cornish Handball Test 5. Sutcliffe Cricket Skill Test	9	
<b>Books for Study</b>	1. Sharma, J.P., “Test and Measurement in Physical Education”, Khel Sahitya Kendra, New Delhi, 2011.		

<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Karad, P.L., "Test measurement and Evaluation in Physical Education", KhelSahitya Kendra, New Delhi, 2011.</li> <li>2. Krishnan, J., "Evaluation of Physical Education and Sports", First Edition, Sports Publication, New Delhi, 2005.</li> <li>3. Verma, H, "Test and Measurement in Physical Education", Sports Publications. New Delhi, 2013.</li> <li>4. Srivastava, A.K., "Evaluation in Test and Measurement", Sports Publications, New Delhi, 2013.</li> </ol>
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#### Teaching and learning methods

- Lecture Method, Demonstration, Diagram, Models, Assignments, Group Discussion, ICT.

#### Course Outcome (CO)

**On successful completion of the course, the students able to**

**CO 1:** Explain the needs & importance of test, measurement and evaluation. **(K 2)**

**CO 2:** Make use of standardized test. **(K 3)**

**CO 3:** Describe the importance of components in physical fitness. **(K 2)**

**CO 4:** Examine the Fitness through some standard tests. **(K 4)**

**CO 5:** Experiment the skills test. **(K 3)**

#### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3	2		2		3				1	2	2		15
CO 2	3	2		3		3				2		2		15
CO 3	3	1	1	3		2	1			2		2		15
CO 4	2	2		3		2				3		2		14
CO 5	3	3		2		1				3		2		14
<b>Grand Total of COs with PSOs and POs</b>														<b>73</b>
<b>Mean Value of COs with PSO and POs = 73/33</b>														<b>2.21</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.21</b>
Observation	<b>COs of Test, Measurement and Evaluation in Physical Education and Sports strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 20223)**

<b>Title</b>	<b>Practical: Test, Measurement and Evaluation in Physical Education</b>	<b>Course Code</b>	<b>22UPEP55</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>30</b>
<b>Semester</b>	<b>V</b>	<b>Credit</b>	<b>02</b>
Course Educational Objectives (CEO)	<ul style="list-style-type: none"> <li>• To understand the concept of test, measurement and Evaluation</li> <li>• To know the criteria of good test.</li> <li>• To gain the profound knowledge of components in physical fitness.</li> <li>• To provide the thorough knowledge on testing for physical fitness.</li> <li>• To able to evaluate the standardized skills in some major games.</li> </ul>		
<b>Content</b>			
<p><b>PHYSICAL FITNESS COMPONENTS TEST:</b></p> <ol style="list-style-type: none"> <li>1. Speed – 40 yards, 60 yards</li> <li>2. Strength – Hand Grip Strength Test, Push Ups</li> <li>3. Endurance- Cooper’s 12min Run/walk, Harvard Step test.</li> <li>4. Agility - T -Test, 4X10 yards shuttle run</li> <li>5. Flexibility – Sit and Reach Test, Vertical Jump.</li> </ol> <p><b>FITNESS TEST:</b></p> <ol style="list-style-type: none"> <li>1. AAHPRED Youth Fitness Test</li> <li>2. Kraus Weber Test</li> <li>3. Johnson Motor Educability Test</li> <li>4. BMI (Body Mass Index)</li> <li>5. SDAT Test</li> </ol> <p><b>SKILL TESTS:</b></p> <ol style="list-style-type: none"> <li>1. Johnson Basketball Test</li> <li>2. Friedel Field Hockey Test</li> <li>3. Helman Volleyball Test</li> <li>4. Cornish Handball Test</li> <li>5. Sutcliffe Cricket Skill Test</li> </ol>			
Book for Study	1. Sharma, J.P., “Test and Measurement in Physical Education”, KhelSahitya Kendra, New Delhi, 2011.		
Book for Reference	<ol style="list-style-type: none"> <li>1. Karad, P.L., “Test measurement and Evaluation in Physical Education”, KhelSahitya Kendra, New Delhi, 2011.</li> <li>2. Krishnan, J., “Evaluation of Physical Education and Sports”, First Edition, Sports Publication, New Delhi, 2005.</li> <li>3. Verma, H, “Test and Measurement in Physical Education”, Sports Publications.New Delhi, 2013.</li> <li>4. Srivastava, A.K., “Evaluation in Test and Measurement”, Sports Publications, New Delhi, 2013.</li> </ol>		

### Teaching and learning methods

- Demonstration, ICT, Videos.

### Course Outcome (CO)

On successful completion of the course, the students able to

**CO 1:** Make use of standardized test. **(K 3)**

**CO 2:** Apply the Fitness test **(K 3)**

**CO 3:** Evaluate the skill performance of the players. **(K 5)**

**CO 4:** Demonstrate the skill and Fitness test. **(K 2)**

**CO 5:** Measure the fitness level of the players. **(K 5)**

### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3	2		2		3				1	2			13
CO 2	3	2		3		3								11
CO 3	3	1	1	3		2	1							11
CO 4	2	2		3		2								09
CO 5	3	3		2		1								09
<b>Grand Total of COs with PSOs and POs</b>														<b>53</b>
<b>Mean Value of COs with PSO and POs = 53/24</b>														<b>2.21</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.21</b>
Observation	<b>COs of Practical: Test, Measurement and Evaluation in Physical Education and Sports strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514  
DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2019 - 2020)**

<b>Title (Core – IX)</b>	<b>Practical: Teaching Practice</b>	<b>Course Code</b>	<b>22UPEP65</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>75</b>
<b>Semester</b>	<b>V</b>	<b>Credit</b>	<b>03</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To understand the part of general lesson plan.</li> <li>• To know the parts of particular lesson plan</li> <li>• To familiarize the techniques of marching.</li> <li>• To impart the knowledge of indigenous activities.</li> <li>• To elucidate the concepts of Minor games</li> </ul>		
<b>Content</b>			
<p><b>1. GENERAL LESSON PLAN</b></p> <ol style="list-style-type: none"> <li>1. Assembly and roll call</li> <li>2. Introductory part (Warming-up)</li> <li>3. Formal part</li> <li>4. Special part</li> <li>5. Recreation part</li> <li>6. Assembly and dismissal</li> </ol> <p><b>2. PARTICULAR LESSON PLAN</b></p> <ol style="list-style-type: none"> <li>1. Assembly and roll call</li> <li>2. Suitable warming-up</li> <li>3. Teaching of fundamentals</li> <li>4. Practice of fundamentals</li> <li>5. Lead-up activities</li> <li>6. Whole game</li> <li>7. Assembly and dismissal</li> </ol>			
<b>Books for Study</b>	<ol style="list-style-type: none"> <li>1. Bevinson Perinbaraj,S., “Methods in Physical Education”, Third Edition, VinsiAgencies, Karaikudi, 2013.</li> <li>2. Dr. A. Athicha Pillai,“Hand Book on Indigenous Activities”, First Edition, , Karaikudi, 2006.</li> </ol>		
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Arya,Sushanth, K., “Methods in Physical Education”, First Edition,Sports Publications, New Delhi, 2013.</li> <li>2. Gopalakrishnan, R.W., “Teaching Methods of Physical Education”, Sports Publications, New Delhi, 2012.</li> <li>3. Mojumdar and Mohum, R., “Methods in Physical Education”, Sports Publications, New Delhi, 2009.</li> <li>4. Verma,H., “Methods and Management of Physical Education”, First Edition, Sports Publications, Chennai, 2012.</li> </ol>		

**Teaching and learning methods**

- Demonstration, ICT, Videos, Explanation.

**Course Outcome (CO)**

**On successful completion of the course, the students able to**

**CO 1:** Select the suitable methods for teaching physical activities. **(K4)**

**CO 2:** Make use of the learnt teaching techniques in the physical education classes. **(K2)**

**CO 3:** Motivate the students for active participation in sports. **(K3)**

**CO 4:** Evaluate the learning capabilities of the students. **(K4)**

**CO 5:** Construct new techniques in teaching methodology. **(K4)**

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3		1		3	3	3			3			2	18
CO 2	3	3	3		3	3	3			3			2	23
CO 3	3	3		3	3	3	3	3	1					22
CO 4	3	3		3	2	3	3	3			3			23
CO 5						3	3			1	1			08
<b>Grand Total of COs with PSOs and POs</b>														<b>94</b>
<b>Mean Value of COs with PSO and POs = 94/35</b>														<b>2.68</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.68</b>
Observation	<b>COs of Practical - Teaching Practice strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Core Elective– IA)</b>	<b>Exercise Physiology</b>	<b>Course Code</b>	22UPEE15
Class	<b>III B.Sc (Physical Education)</b>	Hours	<b>45</b>
Semester	<b>V</b>	Credit	<b>03</b>
Course Educational Objectives(CEO)	<ul style="list-style-type: none"> <li>• To learn about the concept of Exercise Physiology and metabolism.</li> <li>• To know the concept of metabolism.</li> <li>• To understand the various physiological effects on human body during exercise.</li> <li>• To obtain the knowledge of nervous system and its function.</li> <li>• To study the effect of doping and its prevention.</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Meaning and Definitions of Exercise Physiology - Metabolism - Types of Metabolism, Anabolism, Catabolism - Anaerobic Metabolism- Aerobic Metabolism - Electron Transport System - Krebs Cycle - Carbohydrates, Fat and Protein Metabolism - oxygen debt – oxygen deficit.	9	
II	SKELETAL MUSCLE AND FUNCTION: Microscopic Structure of muscle – Muscle Fiber - Slow-twitch muscle fiber - Fast-twitch muscle fiber - Sliding Filament Theory of Muscular Contraction - Effect of Training on muscular system.	9	
III	RESPIRATORY SYSTEM AND EXERCISE: Mechanism of breathing – Pulmonary ventilation / minute ventilation during rest and exercise – control of ventilation – Lung volumes and capacities - Effect of exercise on Respiratory system.	9	
IV	CARDIOVASCULAR SYSTEM AND EXERCISE: Structure of the heart and cardiac cycle, cardiac output - Stroke volume and heart rate. Blood pressure – factors affecting blood pressure and heart rate - Effect of exercise on circulatory system.	9	
V	EXERCISE AND ENVIRONMENT: Exercise and temperature regulations – Hot humid climate – cold climates – Effect of High altitude on Physical performance – Physiological adaptations to altitude – Physiological changes in under water conditions.	9	
<b>Books for Study</b>	1. Sivaramakrishnan, S., “Anatomy and Physiology for Physical Education”, First Edition, Friends Publication, Chennai, 2006.		

<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Blaisdall, A., "Human Physiology", Sports Publications, Chennai, 2006.</li> <li>2. Budhe, A.A., "Exercise Physiology", Sports Publications, Chennai, 2013.</li> <li>3. Marieb, N., "Human Anatomy and Physiology", Benjamin Publication, New Delhi, 2006.</li> <li>4. Sandhiya Tiwari, (2000) Exercise Physiology. New Delhi: Surjeet Publications.</li> <li>5. Shaver, L. G. (2001). Physiology of exercise. New Delhi: Surjeet Publications.</li> </ol> <p>Majumdar &amp; Pralay (2002). Physiology of Sports and Exercise. Kolkata: New Central Book Agency Ltd.,</p>
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### Teaching and learning methods

- Lecture Method, Diagram, Pictures, Models, Video observation.

### Course Outcome (CO)

On successful completion of the course, the students able to

**CO 1:** Explain the concept of metabolism. **(K 1)**

**CO 2:** Know the effect of exercise on muscular system. **(K 2)**

**CO 3:** Analyze the effects of exercise on respiratory system. **(K 4)**

**CO 4:** Describe the effects of exercise on circulatory system. **(K 2)**

**CO 5:** Illustrate about the muscular fatigue. **(K 2)**

### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	2		1	1		3	3			2			1	13
CO 2	1			2		3	3			3		2	2	16
CO 3	3	2	2	2		3	3			3		2	2	22
CO 4	2		1	3		3	3			3		1	2	18
CO 5	3		2	1		3	3			3		1	1	17
<b>Grand Total of COs with PSOs and POs</b>														<b>86</b>
<b>Mean Value of COs with PSO and POs = 86/39</b>														<b>2.20</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.20</b>
Observation	<b>COs of Exercise Physiology strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Core Elective- IB)</b>	<b>Sports Journalism</b>	<b>Course Code</b>	<b>22UPEE15</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>45</b>
<b>Semester</b>	<b>V</b>	<b>Credit</b>	<b>03</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>To shape future Sports journalism for print electronic and web media</li> <li>To ensure that the students of the department have equal exposure to various sports aswell as contemporary trends in various mass mediums.</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Ethics of Journalism and sports Bulletins – Canons of Journalism –New, Information and Ideas – Journalism and Sports Education.	9	
II	Structure of Sports Bulletin – Compiling a bulletin – Types of Bulletin – hourly bulletin and special bulletin – External bulletin.	9	
III	Sports as an integral part of Physical Education – Sports organization and sports journalism – News Writing- General news reporting and sports reporting.	9	
IV	Brief review of Olympic Games, Common Wealth Games and Indian Traditional Games.	9	
V	Mass Media in Journalism – Radio and T.V Commentary – Running Commentary on the radio – Sports experts comments – Sports reviews for the Radio and T.V.	9	
<b>Book for Study</b>	1. Ahiya B.N. (1998). <i>Theory and Pracitce of journalism: Set to Indian Context</i> , 3 <sup>rd</sup> ed. Delhi:Subject publications.		
<b>Books for Reference</b>	1. Ahiya, B.N. & Choabra, (1990). <i>S.S.A concise course in Reporting Etc</i> , Delhi: Subject publication Bhaft, S.C. (1991). <i>Broadcast Journalism in India from the Earliest Time to the President day Ilroad</i> , Sterling publication Pvt., Ltd. 2. Parthasarathy, R. (1991). <i>Journalism in India from the Earliest Time to the President day II road</i> , Sterling Publication Pvt., Ltd. 3. Varma, A.K. (1993.). <i>Advanced Journalism</i> , New Delhi: Har Anand publications.		

**Teaching and learning methods**

- Lecture Method, Diagram, Pictures, Models, Video observation.

**Course Outcome (CO)****On successful completion of the course, the students able to****CO1:** To student the ability to think Critically, Creatively and independently**CO2:** To the ability to competently use technology appropriate to the medium**CO3:** To the ability to prepare content for news media outlets.**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	2		1	1		3	3			2			1	13
CO 2	1			2		3	3			3		2	2	16
CO 3	3	2	2	2		3	3			3		2	2	22
CO 4	2		1	3		3	3			3		1	2	18
CO 5	3		2	1		3	3			3		1	1	17
<b>Grand Total of COs with PSOs and POs</b>														<b>86</b>
<b>Mean Value of COs with PSO and POs = 86/39</b>														<b>2.20</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.20</b>
Observation	<b>COs of Exercise Physiology strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATUR -625514**  
**DEPARTMENT OF PHYSICAL EDUCATION**  
**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

**INTERNSHIP (22UIN15)**

**Objectives:**

- To offer a different way of learning experience.
- To gain significant experiences on working in sports Academy and Fitness centres.
- To acquire the employability skills.

**Outline:**

- The students shall undertake their internship from IV/V Semester holidays and must submit the report and attendance certificate before the external examinations of VI Semester.
- The students must periodically report their progress and status to their respective staff-In-charge/supervisor.
- The students must complete their internship of 25 days by undertaking any one of the following ways.
- The students shall work as intern in any of the related forums of their feasibility such as Sports Academy, Fitness Centers, Gym, etc.

**Evaluation :**

Internal : 50 marks

Progress Report

EXTERNAL - 50 Marks

Competent person of the laboratory/industry/research centres/institutions.

Total - 100 marks

**ARULANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Self Learning)</b>	<b>Olympic Movement</b>	<b>Course Code</b>	<b>22UPESL5</b>
<b>Semester</b>	<b>V</b>	<b>Credit</b>	<b>03</b>
<b>Course Educational Objectives (CEO)</b>	<ol style="list-style-type: none"> <li>1. To provide basic knowledge of Olympic movement</li> <li>2. To analyze the values and significance of Olympics.</li> <li>3. To study the ancient and modern Olympics games.</li> <li>4. To explain the different Olympics games.</li> <li>5. To discuss about the various committees in Olympic Games</li> </ol>		
<b>Content</b>			
I	Origin of Olympic Movement: Philosophy of Olympic movement - The early history of the Olympic movement - The values and significance in the development of the modern Olympic movement - Olympic Ideals, Olympic Rings, Olympic Flag - Marathon run.		
II	Ancient and Modern Olympic Games: Ancient and modern Olympics - Olympic protocol for member countries - Olympic code of Ethics - Olympics in action - Sports for all.		
III	Different Olympic Games: Origin, hosted nations & cities and list of sports discipline in Para Olympic Games, Summer Olympics, Winter Olympics and Youth Olympic Games - Doping – WADA		
IV	Committees of Olympic Games: International Olympic Committee - Structure and Functions - National Olympic Committees and their role in Olympic movement, Summer Olympic medal winners of India - International Para Olympic committee		
V	List of Sports and Games approved by IOC, AIU and SGFI.		
<b>Book For Study</b>	1. M.L.Kamelsh, Foundation of Physical Education (2005), Friends Publication, New Delhi.		
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Singh, Ajmer., et. al. (2005). Essential of Physical Education. New Delhi: Kayani Publication.</li> <li>2. Burbank, J.M., Andranovich, G.D. &amp; Heying Boulder, C.H. (2001). Olympic dreams: the impact of mega-events on local politics: Lynne Rienner.</li> </ol>		

### Course Outcome (CO)

On successful completion of the course, the student able to

**CO 1:** Describe the concept of physiotherapy in sports medicine. **(K1)**

**CO 2:** Apply the therapeutic modalities, electric therapeutic modalities to the injured players/ athletes. **(K3)**

**CO 3:** Provide the appropriate exercise for the injured players/ athletes **(K3)**

**CO 4:** Relate the importance of rehabilitations and its scope. **(K2)**

**CO 5:** Apply the meaning of First Aid for open wounds. **(K-3)**

### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3					2	2			3	2			12
CO 2	2	3				2	2			3	3	2		17
CO 3	2	3				2	2			3	3	3		18
CO 4	2			3		2	2			2	2	2	2	17
CO 5	3	1				2	3			3	3	1		16
<b>Grand Total of COs with PSOs and Pos</b>														<b>93</b>
<b>Mean Value of COs with PSO and POs = 80/34</b>														<b>2.35</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and Pos			<b>2.35</b>
Observation	<b>COs of Olympic Movement strongly related with PSOs and Pos</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Core – IX)</b>	<b>Kinesiology and Biomechanics in Physical Education</b>	<b>Course Code</b>	<b>22UPEC96</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>75</b>
<b>Semester</b>	<b>VI</b>	<b>Credit</b>	<b>04</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To understand the concept of movement in various stage.</li> <li>• To learn the location and actions of muscles in human body.</li> <li>• To analysis contraction of muscles movement.</li> <li>• To learn the biomechanical principles in sports and games</li> <li>• To Understand the application of the principles of kinesiology and Bio mechanics</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Introduction: History and development of Kinesiology, Role and Importance of kinesiology in physical education. Classification of synovial joints and body movements.	15	
II	Origin, Insertion and Actions of Muscles: Origin, insertion and actions of following muscles - Biceps Triceps, Trapezius, Latissimus dorsi, Pectoralis major and minor, Deltoid – Hamstring – Quadriceps – Soleus - Gastrocnemius, Plantaris.	15	
III	Contraction of muscle: Introduction, Meaning, Muscular designing and kinesiological grouping, Axis and planes, Types of muscle contraction - Isotonic, Isometric and Isokinetic contraction	15	
IV	Biomechanics: Basic of Biomechanics, Biomechanics in sports, Mechanical principles, Laws of motion, Types of motion, Factors influencing motion, Air gravity and water friction, Simple machine levers, Types of levers and examples of body equilibrium.		
V	Applications of Kinesiology and Biomechanical Principles: Gait analysis. Application and analysis of Biomechanical principles in Walking, Running, Throwing, Jumping, Pushing, Pulling, Hitting. Application and analysis of techniques of different Sports and Games	15	
<b>Book for Study</b>	<ol style="list-style-type: none"> <li>1. Dhanajoy, S., “Pedagogic of Kinesiology”, Sports Publications, Chennai, 2005.</li> <li>2. Dhanajoy,S, “Mechanical Basics of Biomechanics”, Sports Publications,New Delhi, 2000.</li> </ol>		
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Rathore andVishan Singh, “Sports Biomechanics”, Sports Publications, New Delhi, 2013.</li> <li>2. Verma andHemant, “Sports Kinesiology”, First Edition, Sports Publications,New Delhi, 2013.</li> <li>3. Anderson, T.M., “Biomechanics of Human Motion”, First Edition, Sports Publications, Chennai, 2003.</li> </ol>		

### Teaching and learning methods

- Lecture method, Pictures, Chart, Diagram, Animation, Models, Video observation

### Course Outcome (CO)

On successful completion of the course, the students able to

**CO 1:** Define and describe the term kinesiology and the fundamental movements. **(K1)**

**CO 2:** show the location of upper limb and lower limb muscles. **(K2)**

**CO 3:** Describe the term biomechanics and its importance. **(K2)**

**CO 4:** Explain mechanical theories of lever and equilibrium. **(K2)**

**CO 5:** Illustrate the concept of force and its application. **(K2)**

### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3		1	1		3	3			2			1	14
CO 2	3			2		3	3			3		2	2	18
CO 3	3	2	2	2		3	3			3		2	2	22
CO 4	3		1	3		3	3			3		1	2	19
CO 5	3		2	1		3	3			3		1	1	17
<b>Grand Total of COs with PSOs and Pos</b>														<b>90</b>
<b>Mean Value of COs with PSO and POs = 90/39</b>														<b>2.31</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.31</b>
Observation	<b>COs of Kinesiology and Biomechanics in Physical Education and Sports strongly related with PSOs and Pos</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Core – X)</b>	<b>Sports Management</b>	<b>Course Code</b>	<b>22UPED06</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>75</b>
<b>Semester</b>	<b>VI</b>	<b>Credit</b>	<b>04</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To incorporate the knowledge of the sports management.</li> <li>• To impart the knowledge of personal management</li> <li>• To understand the concept of Sports marketing.</li> <li>• To know about the equipments maintenance.</li> <li>• To understand the information about the finance and budget.</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Meaning and Definition of Sports management – Scope of sports management – Basic principles of sports management – Functions of sports management.	15	
II	Personal Management: Objectives – Personal Policies – Personal Recruitment – Role of Personal manager. Programme management: Functions of sports management.	15	
III	Sports marketing: Meaning – Factors involved in the marketing of sports – Market awareness – Developing a target market strategy – Quality and price of sports products.	15	
IV	Supplies of sports equipment: Guidelines for selection and supply of equipments – Equipment room, Equipment and supply manager – Guidelines for checking, storing and issuing – Care and Maintenance of equipments – Stock Register – Maintenance of sports goods.	15	
V	Accounting and Budgeting – Definition and role of accounting in Sport and Fitness enterprise raising of funds – Types of Budget – Budget record maintenance – the accounting system	15	
<b>Books for Study</b>	1. Chakraborty, S., “Sports Management”, Sports Publication”, New Delhi, 2009.		
<b>Books for Reference</b>	1. Dr. Sumna Bala, “Fundamental of Sports Management”, 2020. 2. Krishna Kant Sahu, “Sports Management”, 2017. 3. V. Satyanarayana, “Sports Management” Hydrabed 2019. 4. Aaron C.T. Smith and Bobsrweart, “Introduction to Sports Marketing” 2012. 5. Rob Wilson and MarkPiekarz, “Sports Management the basics” 2015.		

### Teaching and learning methods

- Lecture Method, Chart, Diagram, Models, Assignments, Group Discussion.

### Course Outcome (CO)

On successful completion of the course, the student able to

**CO 1:** Explain the concepts of organization, administration and supervision. **(K2)**

**CO 2:** Adapt the standard of physical education program. **(K3)**

**CO 3:** Analyze the organization schemes of physical education. **(K4)**

**CO 4:** Construct the playfields. **(K4)**

**CO 5:** Prepare the budget and to maintain the stock register. **(K4)**

### Mapping of COs with PSOs and Pos

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	2	2	2			3	1	3	2	1	2	3		21
CO 2	3	3				2		2			1			11
CO 3	3	1				1		3	2		1	3		14
CO 4	2	3	3			2		1			3	3		17
CO 5	2	1				3					1	1		08
<b>Grand Total of COs with PSOs and POs</b>														<b>71</b>
<b>Mean Value of COs with PSO and POs = 71/34</b>														<b>2.09</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.09</b>
Observation	<b>COs of Organization and Administration in Physical Education strongly related with PSOs and Pos</b>		

**ARULANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514**  
**DEPARTMENT OF PHYSICAL EDUCATION**

(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022-2023)

Title (Core – XI)	Games of Specialization – Theory	Course Code	22UPED16
Class	III B.Sc (Physical Education)	Hours	45
Semester	VI	Credit	03
Course Educational Objectives(CEO)	<ul style="list-style-type: none"> <li>• To know the history of games of specialization.</li> <li>• To Know the fundamental and advanced skill in the games of specialization</li> <li>• Understand the relationship between fitness components and performance variables.</li> <li>• Know the marking and rules of games of specialization.</li> <li>• To realize the concepts in officiating methods in games of specialization</li> </ul>		
Unit	Content	No. of Hours	
I	History – origin of the game - Development of the Game – Affiliating bodies of the game- Recent developments- Trophies and Tournaments	9	
II	Fundamental skills of the Hockey, Football, Volleyball, Basketball, Badminton, Handball, Cricket, Kabaddi and Kho Kho. Advanced skills of the Hockey, Football, Volleyball, Basketball, Badminton, Handball, Cricket, Kabaddi and Kho Kho.	9	
III	Training – Warming up – General and specific – Warming Down – Essential Fitness components – Strength, Speed, endurance, Flexibility, Agility related to the game – lead up Activity.	9	
IV	Ground marking and Measurements – Equipments – Rules and Regulations of the game.	9	
V	Mechanism of Officiating – Methods of Officiating – Duties of Officials – Officials signals of – Scoring system of the game.	9	
<b>Books for study</b>	1. Thakur, J.K., “Measurement of Playing Field”, Sports Publications, New Delhi, 2013		
<b>Books for Reference</b>	1. Birumal, “Football Techniques”, NIS Publications, New Delhi, 2006. 2. BudheAmitarjun., “Officiating and Coaching”, Sports Publications New Delhi, 2013. 3. Monika, A, “Hockey Coaching Manual”, Sports Publications, First Edition, New Delhi, 2005. 4. Monika, A., “Basketball”, First Edition, Sports Publications, New Delhi, 2005. 5. Monika, A., “Volleyball”, First Edition, Sports Publications, New Delhi, 2005. 6. 6. Bhari, B., “Layout of Play Field”, Sports Publications, New Delhi, 2010.		

### Teaching and learning methods

- Lecture method, Pictures, Diagram, Animation, Models, Assignment, Video observation.

### Course Outcome (CO)

On successful completion of the course, the students able to

**CO 1:** Describe the history of games of specialization. **(K2)**

**CO 2:** Apply the new skills, using latest equipment, techniques, rules and regulations. **(K3)**

**CO 3:** Analyze the fitness components during practice and in playing situation. **(K4)**

**CO 4:** Marking the measurements of court/fields in the games of specialization. **(K3)**

**CO 5:** Evaluate the method of officiating and scoring system of games of specialization. **(K4)**

### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3		1			3	3			3				13
CO 2	3	3	3		1	3	3		2	3	1		2	24
CO 3	3	3	2	3	2	3	3			2	1		1	23
CO 4	3	3	1	3	2	3	3		3	3	2		2	28
CO 5	3	3	2	2	1	3	3		1	3	3		2	26
<b>Grand Total of COs with PSOs and POs</b>														<b>114</b>
<b>Mean Value of COs with PSO and POs = 114/47</b>														<b>2.42</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.42</b>
Observation	<b>COs of Games of Specialization strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Practical)</b>	<b>Practical: Games of Specialization</b>	<b>Course Code</b>	<b>22UPEP76</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>45</b>
<b>Semester</b>	<b>VI</b>	<b>Credit</b>	<b>03</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To Know the fundamental and advanced skill in the games of specialization</li> <li>• To know the court/ field marking rules of games of specialization.</li> <li>• To realize the concepts in officiating methods in games of specialization</li> <li>• To learn the specific drill to improve the performance.</li> <li>• To identify the rules and regulation of specialization game.</li> </ul>		
<b>CONTENT</b>			
<p><b>GAME OF SPECIALIZATION</b></p> <p>Coaching, officiating and playing ability in:</p> <ul style="list-style-type: none"> <li>• Hockey,</li> <li>• Football,</li> <li>• Volleyball,</li> <li>• Basketball,</li> <li>• Badminton</li> <li>• Handball.</li> <li>• Cricket</li> <li>• Kabaddi</li> <li>• Kho- Kho</li> </ul>			
<b>Books for study</b>	1. Thakur, J.K., “Measurement of Playing Field”, Sports Publications, New Delhi, 2013.		
<b>Books for Reference</b>	1. Birumal, “Football Techniques”, NIS Publications, New Delhi, 2006. 2. BudheAmitarjun., “Officiating and Coaching”, Sports Publications New Delhi, 2013. 3. Monika, A, “Hockey Coaching Manual”, Sports Publications, First Edition, New Delhi, 2005. 4. Monika, A., “Basketball”, First Edition, Sports Publications, New Delhi, 2005. 5. Monika, A., “Volleyball”, First Edition, Sports Publications, New Delhi, 2005. 6. Bhari, B., “Layout of Play Field”, Sports Publications, New Delhi, 2010.		

**Teaching and learning methods**

- Demonstration, Pictures, Diagram, Animation, Models, Video observation.

**Course Outcome (CO)****On successful completion of the course, the students able to****CO 1:** Summarize the knowledge of rules and regulation of specialization games. **(K2)****CO 2:** Apply the new skills, using latest equipment, techniques, rules and regulations. **(K3)****CO 3:** Demonstrate the skills specialization games perfectly. **(K4)****CO 4:** Assess the different types of drills to improve the performance. **(K3)****CO 5:** Evaluate the method of officiating and scoring system of games of specialization. **(K4)****Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3		1			3		3		3				13
CO 2	3	3	3		1	3		3	2	3	1		2	24
CO 3	3	3	2	3	2	3		3		2	1		1	23
CO 4	3	3	1	3	2	3		3	3	3	2		2	28
CO 5	3	3	2	2	1	3		3	1	3	3		2	26
<b>Grand Total of COs with PSOs and Pos</b>														<b>114</b>
<b>Mean Value of COs with PSO and POs = 114/47</b>														<b>2.42</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.42</b>
Observation	<b>COs of Practical: Games of Specialization strongly related with PSOs and Pos</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Core –XII)</b>	<b>Yoga for Fitness</b>	<b>Course Code</b>	<b>22UPED26</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>45</b>
<b>Semester</b>	<b>VI</b>	<b>Credit</b>	<b>03</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To Know the Concept of yoga.</li> <li>• To comprehend the standing and sitting position of asanas</li> <li>• To understand the Prone and Supine positions of asanas.</li> <li>• To realize the concept of pranayama</li> <li>• To recognize the importance of kriyas and meditation.</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Meaning and Definition of Yoga – Aim and Objectives of Yoga – Types of Yoga - History of Yoga – Eight limbs of Yoga– Yama, Niyama, Asana, Pranayama, Prathiyahara, Dharana, Dhyana, Samathi- Differences between Asana and Physical Exercises.	9	
II	Asanas: Meaning - Guidelines for practicing asanas – Surya Namaskar - Standing Position: Tadasana, Trikonasana,Vriksasana,Utkatasana- Long Sitting Position: Padmasana, Pascimottasana, Vajrasana, Vakarasana.	9	
III	Prone Position: Bhujangasana, Dhanurasana, Salabhasana, Makarasana - Supine Position: Chakrasana, Sarvangasana, Halasana, Shavasana - Kneeling Position: Bakasana, Mayurasana, Sirasana,Ustrasana.	9	
IV	Pranayama - Meaning– Phases of Pranayama: Purka, Kumbhaka, Rechaka.-Nadis: Ida Nadi, PingalaNadi, Shushma - Bhandas: JalendraBandha, UddiyanaBandha, MoolaBandha- Nadisuddhi-Nadishodhana.	9	
V	Kriyas – Meaning – Types of Kriyas: Neti, Dhauti, Basti, Nauli, Trataka, Kapalabhati - Meditation - Meaning –Techniques of Meditation.	9	
<b>Books for Study</b>	<ol style="list-style-type: none"> <li>1. Iyenkar, B.K.S., “Light on Yoga”, Thirty Second Editions, Harper Colling Publications, London, 2005.</li> <li>2. Chandrasekaran, K., Sound Health through Yoga, Sedapatti, PremKalyan Publications, 1999.</li> </ol>		
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Brown, Yeats F., “How to use Yoga”, Sports Publications, New Delhi, 2018.</li> <li>2. Gore, C.S., “Yoga and Health”, Sports Publications, New Delhi, 2011.</li> <li>3. Pramanik, T.N., “Yoga for Healthy Body”, Sports Publications, New Delhi, 2013.</li> <li>4. Qureshi, S.S., “Yoga Cures Diabetes” Sports Publications, New Delhi, 2013.</li> <li>5. Srivastava, A.K., “Health and Yoga”, Sports Publications, New Delhi, 2010.</li> </ol>		

**WEBLIOGRAPHY**

1. [www.yogaiya.in/](http://www.yogaiya.in/)
2. [www.yogafederationofindia.com/](http://www.yogafederationofindia.com/)

### Teaching and learning methods

- Lecture method, Pictures, Diagram, Animation, Models, Video observation

### **Course Outcome (CO)**

**On successful completion of the course, the students able to**

**CO 1:** Describe the importance of asana. **(K2)**

**CO 2:** Demonstrate the standing and long sitting asanas. **(K3)**

**CO 3:** Exhibit the asanas in prone and supine position. **(K3)**

**CO 4:** Explain the concept of pranayama. **(K2)**

**CO 5:** Realize the benefits of kriyas. **(K2)**

### **Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	2	3		1		3	3			3	1			16
CO 2	2	3		3	2	3	3	2		3	2			23
CO 3	2	3		3	2	3	3	2		3	2			23
CO 4	2	3		2		3	3	1		3	1			18
CO 5	2	3		2		3	3	1		3	1			18
<b>Grand Total of COs with PSOs and Pos</b>														<b>98</b>
<b>Mean Value of COs with PSO and POs = 98/41</b>														<b>2.39</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.39</b>
Observation	<b>COs of Yoga for Fitness strongly related with PSOs and POs</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514**  
**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Practical)</b>	<b>Practical: Yoga for Fitness</b>	<b>Course Code</b>	<b>22UPEP86</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>45</b>
<b>Semester</b>	<b>VI</b>	<b>Credit</b>	<b>03</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To Know the Concept of yoga.</li> <li>• To understand the position of asanas.</li> <li>• To realize the concept of pranayama</li> <li>• To recognize the importance of kriyas and meditation.</li> </ul>		
<b>Content</b>			
<ul style="list-style-type: none"> <li>• Surya Namaskar.</li> <li>• Standing Position: Tadasana, Trikonasana, Vriksasana, Utkatasana</li> <li>• Long Sitting Position: Padmasana, Pascimottasana, Vajrasana, Vakarasana.</li> <li>• Prone Position: Bhujangasana, Dhanurasana, Salabhasana, Makarasana .</li> <li>• Supine Position : Chakrasana, Sarvangasana, Halasana, Shavasana</li> <li>• Kneeling Position : Bakasana, Mayurasana, Sirasana, Ustrasana.</li> <li>• Pranayama.</li> </ul>			
<b>Books for Study</b>	<ol style="list-style-type: none"> <li>1. Iyengar, B.K.S., “Light on Yoga”, Thirty Second Editions, Harper Colling Publications, London, 2005.</li> <li>2. Chandrasekaran, K., Sound Health through Yoga, Sedapatti, PremKalyan Publications, 1999.</li> </ol>		
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Brown, Yeats F., “How to use Yoga”, Sports Publications, New Delhi, 2018.</li> <li>2. Gore, C.S., “Yoga and Health”, Sports Publications, New Delhi, 2011.</li> <li>3. Pramanik, T.N., “Yoga for Healthy Body”, Sports Publications, New Delhi, 2013.</li> <li>4. Qureshi, S.S., “Yoga Cures Diabetes” Sports Publications, New Delhi, 2013.</li> <li>5. Srivastava, A.K., “Health and Yoga”, Sports Publications, New Delhi, 2010.</li> </ol>		

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1. [www.yogaiya.in/](http://www.yogaiya.in/)
2. [www.yogafederationofindia.com/](http://www.yogafederationofindia.com/)

## Teaching and learning methods

- Lecture method, Pictures, Diagram, Animation, Models, Video observation

## Course Outcome (CO)

On successful completion of the course, the student able to

**CO 1:** Describe the importance of asana. **(K2)**

**CO 2:** Demonstrate the standing and long sitting asana. **(K3)**

**CO 3:** Establish the prone and supine position asana. **(K3)**

**CO 4:** Explain the concept of pranayama. **(K2)**

**CO 5:** Realize the benefits of kriyas. **(K2)**

## Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	2	3		1		3	3			3	1			16
CO 2	2	3		3	2	3	3	2		3	2			23
CO 3	2	3		3	2	3	3	2		3	2			23
CO 4	2	3		2		3	3	1		3	1			18
CO 5	2	3		2		3	3	1		3	1			18
<b>Grand Total of COs with PSOs and Pos</b>														<b>98</b>
<b>Mean Value of COs with PSO and POs = 98/41</b>														<b>2.39</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.39</b>
Observation	<b>COs of Practical: Yoga for Fitness strongly related with PSOs and POs</b>		

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**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Core – XIII)</b>	<b>Project</b>	<b>Course Code</b>	<b>22UPED36</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>45</b>
<b>Semester</b>	<b>VI</b>	<b>Credit</b>	<b>03</b>
<b>Content</b>			
<ol style="list-style-type: none"> <li>1. Experimental Study</li> <li>2. Analytical study</li> <li>3. Comparative Study</li> <li>4. Case Study</li> <li>5. Survey Study</li> </ol>			
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Clarke, David H and H .Harrison Clarke, Research Process in Physical Education</li> <li>2. Rothstein, Anne, L. "Research Design &amp; Statistics for Physical Education"</li> <li>3. Moses, R. Amritta Kumar. "Thesis Writing Format", Madras, Poompugar Pathipagam, 1995.</li> <li>4. Kothari C.R. "Research Methodology"., New Delhi: Wiley Fasern Ltd. 1987.</li> <li>5. Best W. John and James, V. Khan, "Research in Education"., New Delhi: Prentic – Hall of India Private Ltd, 1996.</li> </ol>		

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

- CO1:** Relate the experiments in connection with the projects undertaken. (K1)
- CO2:** Plan for literature survey, experimental work and documentation of results. (K1)
- CO3:** Analyze the compounds using instruments effectively. (K1)
- CO4:** Defend the questions raised in *viva voce* examination. (K1)
- CO5:** Develop the experiments independently in the thrust areas of Physical Education, Health Education and Sports. (K1)

**Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3	3				3	3			3	3	3		21
CO 2	3	2				3	3	3		3	3			20
CO 3	3	3	3			3				3	2			17
CO 4		2				3				3				8
CO 5						2	3	3		3		3		14
<b>Grand Total of COs with PSOs and Pos</b>														<b>80</b>
<b>Mean Value of COs with PSO and POs = 80/28</b>														<b>2.85</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.85</b>
Observation	<b>COs of Project strongly related with PSOs and Pos</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Core Elective II A)</b>	<b>Sports Medicine &amp; First Aid.</b>	<b>Course Code</b>	<b>22UPEE26 (A)</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>45</b>
<b>Semester</b>	<b>VI</b>	<b>Credit</b>	<b>03</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To understand the theory of Sports Medicine.</li> <li>• To know the concept of cold modalities, electric therapeutic modalities.</li> <li>• To do the therapeutic exercises for the injured person.</li> <li>• To gain the knowledge of rehabilitation of sports injury</li> <li>• To understand the concept of First Aid.</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Meaning and Definition of Sports Medicine - Nature and Concept of Sports Medicine, Role of Sports Medicine in Sports and Games- History of Massage - Need and important of Massage, Classifications of Massage	12	
II	Therapeutic Modalities: Cold Modalities – Ice pack – Ice Massage – Ice Immersion. Hot Modalities: Infra-Red lamp –Ultrasound Electrical Modalities: Ultra Violet Rays, Wax bath.	12	
III	Therapeutic Exercise: Classifications – Passive range of Motion – Active Range of Motion – Exercise Program to strengthen the Muscles and Ligament.	12	
IV	Rehabilitations – Meaning and Definitions - Need and important of Rehabilitation - Scope and Methods of Rehabilitation.	12	
V	First aid – Definition – Aim and Scope of first Aid - Open wound: Abrasion - Blisters - Laceration – Incision - Avulsion – Puncture wound. Closed wound: Contusion – Sprain – Strain – Dislocation - Fracture – Types of fracture	12	
<b>Books for Study</b>	1. Mishra, B.K., "Sports Medicine" Sports Publications, New Delhi, 2013.		
<b>Books for Reference</b>	1. Dreeben and Olga, "Introduction to Physical Therapist Assistant", Jones and Burtlet Publishers, New Delhi, 2006. 2. Verma and Hemant, "First Aid", Sports Publications, New Delhi, 2013. 3. Rajeevkumar, , "Sports Medicine and Exercise Physiology", Sports Publication, New Delhi, 2015. 4. Gardiner, M. D., "The Principles of Exercise Therapy", First Edition, CBS Publishers Ltd., New Delhi, 2005.		

### Teaching and learning methods

- Lecture method, ICT, Demonstration, PPT, Group Discussion, Assignment.

### **Course Outcome (CO)**

**On successful completion of the course, the student able to**

**CO 1:** Describe the concept of physiotherapy in sports medicine. **(K1)**

**CO 2:** Apply the therapeutic modalities, electric therapeutic modalities to the injured players/ athletes. **(K3)**

**CO 3:** Provide the appropriate exercise for the injured players/ athletes **(K3)**

**CO 4:** Relate the importance of rehabilitations and its scope. **(K2)**

**CO 5:** Apply the First Aid for open and closed wounds. **(K-3)**

### **Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3					3	2			3	2			13
CO 2	2	3				3	2			3	3	3	3	22
CO 3	2	3				3	2			3	3	3	3	22
CO 4	2			3		3	2			2	2	2	3	19
CO 5	3	1				3	3			3	3	1		17
<b>Grand Total of COs with PSOs and Pos</b>														<b>93</b>
<b>Mean Value of COs with PSO and POs = 93/36</b>														<b>2.58</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.58</b>
Observation	<b>COs of Sports Medicine &amp; First Aid strongly related with PSOs and Pos</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Core Elective – II B)</b>	<b>Sports Psychology and Sociology</b>	<b>Course Code</b>	<b>22UPEE26 (B)</b>
<b>Class</b>	<b>III B.Sc (Physical Education)</b>	<b>Hours</b>	<b>45</b>
<b>Semester</b>	<b>VI</b>	<b>Credit</b>	<b>03</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To understand the psychological aspects.</li> <li>• To know the concept of motivation.</li> <li>• To influence of society in sports and games.</li> <li>• To know the importance of leadership qualities of sports.</li> <li>• To gain the knowledge of sports personality.</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	Definitions of Psychology and Sports Psychology - Need and Importance of Sports Psychology. Learning – Stages of Learning – factors affecting the Learning.	9	
II	Motivation – Definition – Types of Motivation. Reward and Punishment - Emotional Effects – Tension, Anxiety – Types.	9	
III	Personality – Definition –Meaning – Structure of Personality –Measuring Personality. Athletic versus Non-Athletic Personality. Perception – Definition – Theories of Perception-Wrong perception and its types.	9	
IV	Sports Sociology – Nature and scope Leadership – Meaning – Types – Need and importance – Qualities – Character – Leadership in Sports and Sports Ethics of Sociology in Physical Education and Sports – Social Factors influencing in Sports.	9	
V	Leadership – Meaning – Types – Need and importance – Qualities – Character – Leadership in Sports and Sports Ethics	9	
<b>Books for Study</b>	1.Deepak., “Sports Psychology”, Sports Publications, New Delhi, 2013.		
<b>Books for Reference</b>	1.Jain, “Sports Psychology, First Edition, Sports Publications, New Delhi, 2013. 2.Deshmukh, Sanjay, V., “Philosophical, Sociological, Historical and Recreational in Physical Education”, Sports Publication, New Delhi, 2013. 3.Shekar, C., “Aspects of Psychology in Physical Education and Sports”, Sports Publications, Chennai, 2005. 4. Wankahde and Santosh, “Sports Sociology”, First Edition, Sports Publications, New Delhi, 2013. 5. Kamalesh M.L., Psychology in Physical Education and Sports, New Delhi: Metropolitan, 1988.		

### Teaching and learning methods

- Lecture Method, Group Discussion, seminars, Assignments.

### Course Outcome (CO)

On successful completion of the course, the students able to

**CO 1:** Describe the role of sports psychology for athletes and in their performance.

**(K2)**

**CO 2:** Interpret the concept of motivation. **(K1)**

**CO 3:** Describe the personality and its characteristics. **(K2)**

**CO 4:** Explain the psycho-sociological aspects of human behavior in relation to Physical Education and sports. **(K2)**

**CO 5:** Summarize the importance of leadership qualities.

### **(K3) Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3	2	2	1	3	3	3	2	2	2	2	1	1	27
CO 2	3		2	1	2	3	3	3	2	3		2	1	25
CO 3	3		2	2		3	3	2	2	3		2	2	24
CO 4	3	2		3	3	3	3		2	3	3	1	2	28
CO 5	3	2	2		3	3	3	3	3	3	2	1	1	29
<b>Grand Total of COs with PSOs and POs</b>														<b>133</b>
<b>Mean Value of COs with PSO and POs = 133/57</b>														<b>2.33</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.33</b>
Observation	<b>COs of Sports Psychology and Sociology strongly related with PSOs and Pos</b>		

**ARULANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 - 2023)**

<b>Title (Self Learning)</b>	<b>Sports Nutrition</b>	<b>Course Code</b>	<b>22UPESL6</b>
<b>Semester</b>	<b>VI</b>	<b>Credit</b>	<b>03</b>
<b>Course Educational Objectives (CEO)</b>	<ol style="list-style-type: none"> <li>1. Understand the classification of foods and nutrition</li> <li>2. To analyze fluid intake required for physical activity</li> <li>3. To explain about the nutrients: ingestion to energy metabolism</li> <li>4. To discuss about the balance diet for players</li> <li>5. To discuss about the diet analysis.</li> </ol>		
<b>Unit</b>	<b>Content</b>		
I	Introduction to Nutrition Food and Nutrition: Classification of foods. Meaning and definition of Sports Nutrition. Basic Nutrition guidelines. Role of nutrition in sports. Factor to consider for developing nutrition plan.		
II	Nutrients: Ingestion to Energy Metabolism Carbohydrates, Protein, Fat-Meaning, classification and its function. Role of carbohydrates, Fat and protein during exercise. Vitamins, Minerals, Water-Meaning, classification and its function. Role of hydration during exercise, water balance, Nutrition-daily caloric requirement and expenditure		
III	Food and Macro-Nutrients: Functions of food - Nutritional, Emotional, Social, and Classification of food. Sources, Functions, Deficiency and excess effects of carbohydrates, protein, fat and water.		
IV	Balance Diet: Definition - Balanced Diet - Principles of preparing the balanced diet. Balanced diet for Indian Players / School children. Malnutrition and Adulteration of food.		
V	Diet Analysis: Pre-Competition, Competition and Post Competition meals. Diet analysis and planning. Fluid intake during exercise. Nutrition for Special Population		
<b>Book For Study</b>	1. Dr. Priti Rishi Lal (2014) Handbook of Sports Nutrition, Friends Publications, New Delhi		
<b>Books for Reference</b>	<ol style="list-style-type: none"> <li>1. Srilakshmi, B. (2012) Nutrition science. Delhi: New Age International (p) Limited Publishers.</li> <li>2. Srilakshmi, B. (2015) Human Nutrition (For B.Sc., Nursing students) Delhi: New Age International (p) Limited Publishers.</li> </ol>		

**Course Outcome (CO)****On successful completion of the course, the student able to****CO 1:** Describe the concept of physiotherapy in sports medicine. **(K1)****CO 2:** Apply the therapeutic modalities, electric therapeutic modalities to the injured players/ athletes. **(K3)****CO 3:** Provide the appropriate exercise for the injured players/ athletes **(K3)****CO 4:** Relate the importance of rehabilitations and its scope. **(K2)****CO 5:** Apply the meaning of First Aid for open wounds. **(K-3)****Mapping of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3					3	2			3	2			13
CO 2	2	3				3	2			3	3	3	3	22
CO 3	2	3				3	2			3	3	3	3	22
CO 4	2			3		3	2			2	2	2	3	19
CO 5	3	1				3	3			3	3	1		17
<b>Grand Total of COs with PSOs and Pos</b>														<b>93</b>
<b>Mean Value of COs with PSO and POs = 93/36</b>														<b>2.12</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.12</b>
Observation	<b>COs of Sports Nutrition strongly related with PSOs and Pos</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2024)**

<b>Title (Value Added Courses)</b>	<b>Exercise Therapy</b>	<b>Course Code</b>	
<b>Semester</b>	<b>ODD</b>	<b>Hours</b>	<b>30</b>
<b>Course Educational Objectives(CEO)</b>	<ul style="list-style-type: none"> <li>• To understand the theory of Exercise therapy.</li> <li>• To know the concept of electrotherapy.</li> <li>• To do the thermal therapy for the injured person.</li> <li>• To gain the knowledge of massage.</li> <li>• To understand the concept of Massage techniques.</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>Exercise Therapy:</b> Meaning - aims – objectives - types of exercise - rehabilitation exercises for sports injuries (fracture, dislocation, muscle pull, sprain, low back pain).	6	
II	<b>Electrotherapy:</b> diathermy - ultra sound - infrared lamp. <b>Hydrotherapy:</b> cryotherapy - contrast bath.	6	
III	<b>Thermal therapy:</b> Meaning – Methods: Hot pack, Mudpack, wax bath.	6	
IV	<b>Massage:</b> Meaning - do's and dont's in massage – therapeutic effects of massage.	6	
V	<b>Classification of massage techniques:</b> Effleurage (stroking) - petrissage (kneading) – percussion (tapotement) – friction – vibration.	6	
<b>Books for Study</b>	1. Mishra, B.K., "Sports Medicine" Sports Publications, New Delhi, 2013.		
<b>Books for Reference</b>	5. Dreeben and Olga, "Introduction to Physical Therapist Assistant", Jones and Burrtlet Publishers, New Delhi, 2006. 6. Verma and Hemant, "First Aid", Sports Publications, New Delhi, 2013. 7. Rajeevkumar, , "Sports Medicine and Exercise Physiology", Sports Publication, New Delhi, 2015. 8. Gardiner, M. D., "The Principles of Exercise Therapy", First Edition, CBS Publishers Ltd., New Delhi, 2005.		

**Teaching and learning methods**

- Lecture method, Demonstration, PPT, Group Discussion, Assignment.

**Course Outcome (CO)**

**On successful completion of the course, the student able to**

**CO 1:** Describe the concept of exercise therapy. **(K1)**

**CO 2:** Apply the electrotherapy to the injured players/athletes. **(K3)**

**CO 3:** Apply the thermal therapy to the injured players/athletes **(K3)**

**CO 4:** Know the importance of therapeutic usage of massage. **(K2)**

**CO 5:** Apply the meaning of First Aid for open wounds. **(K-3)**

### Mapping of COs with PSOs and POs

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3					3	2			3	2			13
CO 2	2	3				3	2			3	3	3	3	22
CO 3	2	3				3	2			3	3	3	3	22
CO 4	2			3		3	2			2	2	2	3	19
CO 5	3	1				3	3			3	3	1		17
<b>Grand Total of COs with PSOs and Pos</b>														<b>93</b>
<b>Mean Value of COs with PSO and POs = 93/36</b>														<b>2.58</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.58</b>
Observation	<b>COs of Exercise Therapy strongly related with PSOs and Pos</b>		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514**

**DEPARTMENT OF PHYSICAL EDUCATION**

**(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2023 - 24)**

<b>Title: Value Added Courses</b>	<b>Training Methods in Sports and Games</b>	<b>Course Code</b>	
<b>Semester</b>	<b>EVEN</b>	<b>Hours</b>	<b>30</b>
<b>Course Educational Objectives (CEO)</b>	<ul style="list-style-type: none"> <li>• To understand the concepts of conditioning exercises.</li> <li>• To know the methods of endurance training.</li> <li>• To cultivate the concepts of strength training.</li> <li>• To realize the speed training.</li> <li>• To comprehend about the flexibility training.</li> </ul>		
<b>Unit</b>	<b>Content</b>	<b>No. of Hours</b>	
I	<b>CONDITIONING EXERCISES</b> General conditioning exercises - specific conditioning exercises - core exercises -circuit training.	6	
II	<b>ENDURANCE TRAINING</b> Slow continuous run - fast continuous run - varied pace run - fartlek training - intervaltraining.	6	
III	<b>STRENGTH TRAINING</b> Physical exercise with own body weight - physical exercise with external resistance devices - weight training - medicine ball exercises - dumbbell exercises.	6	
IV	<b>SPEED TRAINING</b> Reaction ability training - acceleration ability training - locomotor ability training -speed endurance training.	6	
V	<b>FLEXIBILITY TRAINING</b> Active flexibility exercises - passive flexibility exercises - PNF Stretching.	6	
<b>Books for Study</b>	1. K.Uppal., "Sports Training" Friends publication, New Delhi, 2005.		
<b>Books for Reference</b>	1. Mishra S. C., "Sports Training", Sports Publication, Chennai, 2009. 2. Kawade, R. R., "Sports Training" Sports Publications, Chennai, 2013. 3. Arvind, B., Qureshi and Dabir, "Encyclopedia of Sports Training", Sports Publications, Chennai, 2012. 4. Choudhari and Sanjay.T., "Essential of Strength Training and Conditioning," KhelSahithya Kendra, New Delhi, 2013. 5. Sebastian. P.J., "System of Sports Training", Friends Publications, Chennai, 2013.		

**Teaching and learning methods**

- Class Lecture, Demonstration, ICT, Video observation, Assignments.

**Course Outcome (CO)**

**On successful completion of the course, the students able to**

**CO 1:** Summarize the fundamental concepts of conditioning exercise. **(K1)**

**CO 2:** Identify the importance of Endurance training. **(K3)**

**CO 3:** Evaluate the speed training. **(K4)**

**CO 4:** Classify the speed training. **(K3)**

**CO 5:** Categorize the flexibility training. **(K2)** Mapping

**of COs with PSOs and POs**

Outcomes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO 1	3	3	2			3	3	2		3		1		20
CO 2	3	3	2			3	3	2		3		2		21
CO 3	3	3	2			3	3	2		3		2		21
CO 4	3	3	2			3	3	3		3		3		23
CO 5	3	3	2			3	3	3		3		2		22
<b>Grand Total of COs with PSOs and Pos</b>														<b>107</b>
<b>Mean Value of COs with PSO and POs = 101/40</b>														<b>2.67</b>

**Strong – 3, Medium – 2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			<b>2.67</b>
Observation	<b>COs of Training Methods in Sports and Games strongly related with PSOs and Pos</b>		



**DEPARTMENT OF COMPUTER SCIENCE**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**CBCS and OBE Pattern**  
**(Those who join from 2022-2023 onwards)**

<b>SEMESTER – I</b>				
<b>Part</b>	<b>Subject Code</b>	<b>Title of the paper</b>	<b>Hours</b>	<b>Credits</b>
I	22UTAL11/ 22UHNL11/ 22USNL11	Tamil/ Hindi/French	06	04
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream- A English through Prose & Short Story – Stream- B	05	04
III	22UCSC11	<b>Core: 1 Programming in C</b>	05	04
	22UCSC21	<b>Core: 2 PC Hardware and Troubleshooting</b>	04	03
	22UCSP11	<b>Core Lab: 1 Programming in C–Practical</b>	05	03
	22UCSA11	<b>Allied: 1 Digital Computer Fundamentals</b>	03	03
IV	22UFCE11	FC – Personality Development	1	1
	22UCSH12	Communication Skill	1	-
	22UBRC11	Bridge Course	-	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NCC/NSS/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	---	---
<b>Total</b>			<b>30</b>	<b>23</b>
<b>SEMESTER – II</b>				
I	22UTAL22/ 22UHNL22/ 22USNL22	Tamil/ Hindi/ French	06	04
II	22UENA22/ 22UENB22	English through Prose & Poetry – Stream – A English through Prose & Poetry – Stream – B	05	04
III	22UCSC32	<b>Core: 3 Object Oriented Programming with C++</b>	05	04
	22UCSC42	<b>Core: 4 Web Designing</b>	04	03
	22UCSP22	<b>Core Lab: 2 Object Oriented Programming with C++ - Practical</b>	05	03
	22UCSA22	<b>Allied: 2 Discrete Mathematics</b>	03	03
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skill	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NSS/NCC/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	-	1
<b>Total</b>			<b>30</b>	<b>24</b>

<b>SEMESTER – III</b>				
III	22UCSC53	<b>Core: 5 Programming in JAVA</b>	05	04
	22UCSC63	<b>Core: 6 Data Structures and Algorithms</b>	05	04
	22UCSC73	<b>Core: 7 Operating System</b>	04	03
	22UCSP33	<b>Core Lab: 3 Programming in JAVA–Lab</b>	05	03
	22UCSA33	<b>Allied: 3 Computer Organization and Architecture</b>	04	03
IV	22UCSN13	<b>NME: 1 Web Designing (For Arts students)</b>	03	02
	22UCSS13	<b>SBE: 1 Quantitative Aptitude and Reasoning</b>	03	02
	22UFCE33	FC – Environmental Studies	01	01
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB24	Extension Activities NCC/NSS/Phy.Edn./ YRC/ROTARACT/AICUF/Nature Club	-	-
	22UARE14	ARISE		
		<b>Total</b>	<b>30</b>	<b>22</b>
<b>SEMESTER – IV</b>				
III	22UCSC84	<b>Core: 8 Web Programming</b>	05	04
	22UCSC94	<b>Core: 9 Relational Data Base Management System</b>	05	04
	22UCSD04	<b>Core: 10 Computer Networks</b>	05	04
	22UCSP44	<b>Core Lab: 4 Web Programming – Lab</b>	05	03
	22UCSA44	<b>Allied: 4 Operation Research</b>	03	03
IV	22UCSN24	NME: 2 Web Designing (For Science Students)	03	02
	22UCSS24	SBE: 2 Open Source Technology	03	02
	22UFCH44	FC – Religious Literacy and Peace Ethics	01	01
V	22UNCC/NSS/PH Y.EDU./YRC/ ROT/ACF/NCB24	Extension Activities NCC/NSS/Phy.Edn./ YRC/ROTARACT/AICUF/Nature Club	-	01
	22UARE14	ARISE	-	01
		<b>Total</b>	<b>30</b>	<b>25</b>
<b>SEMESTER – V</b>				
III	22UCSD15	<b>Core: 11 Big Data Analytics using R</b>	05	05
	22UCSD25	<b>Core: 12 Mobile Computing</b>	05	05
	22UCSD35	<b>Core: 13 Dot NET Programming</b>	05	05
	22UCSD45	<b>Core: 14 Network Security and Cryptography</b>	05	04

	22UCSP55	<b>Core Lab: 5 Dot NET Programming – Lab</b>	05	03
	22UCSE15	<b>Core Elective:1</b> <b>1. Introduction to Data Science</b> <b>2. Artificial Neural Networks</b> <b>3. Linux Shell Programming</b>	03	03
IV	22USSI16	Soft Skills	02	-
		<b>Total</b>	<b>30</b>	<b>25</b>
<b>SEMESTER – VI</b>				
III	22UCSD56	<b>Core: 15 Software Engineering</b>	05	04
	22UCSD66	<b>Core: 16 Data Mining and Ware Housing</b>	04	04
	22UCSD76	<b>Core: 17 Mobile Application Development</b>	05	04
	22UCSD86	<b>Core: 18 Python Programming</b>	05	03
	22UCSD96	<b>Core: 19 Project Work</b>	01	02
	22UCSP66	<b>Core Lab: Python Programming – Lab</b>	05	03
	22UCSE26	<b>Core Elective: 2</b> <b>1. Internet of Things (IoT)</b> <b>2. Artificial Intelligence</b> <b>3. Software Testing</b>	03	03
IV	22USSI16	Soft Skills	02	02
		<b>Total</b>	<b>30</b>	<b>25</b>

#### Credits for each Semester

Semester	I	II	III	IV	V	VI	Total
Credits	23	24	22	25	25	25	<b>144</b>

#### Self-Learning Courses

S.No	Semester	Sub. Code	Title of the Paper	Credits
1.	III	22UCSSL3	Software Project Management	3
2.	IV	22UCSSL4	Cloud Computing	3
3.	V	22UCSSL5	System Administration and Maintenance	3
4.	VI	22UCSSL6	Ethical Hacking	3

**ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : B. Sc. (Comp. Sci.)  
Semester : V  
Subject Code : 22UCSD15

Part : III – Core-11  
Hours : 75 Hours  
Credits : 05

**BIG DATA ANALYTICS USING R**

**Course Objectives:**

- Understand about the concept of Big Data
- Understand the challenges of Big Data
- Develop program using R Programming
- Create a program using the functions for data frame
- Create program for data analytics and data visualization

**Unit – 1: Introduction to Big data**

**15 Hours**

Data, classification Of Digital Data--structured, unstructured, semi-structured data, characteristics of data, evaluation of big data, definition and challenges of big data , what is big data and why to use big data, business intelligence Vs big data.

**Unit – 2: Big data Analytics**

**15 Hours**

What is and isn't big data analytics, Why hype around big data analytics, Classification of analytics, top challenges facing big data, importance of big data analytics, technologies needed to meet challenges of big data.

**Unit – 3: Introduction to R and getting started with R**

**15 Hours**

What is R, Why R , advantages of R over other programming languages, Data types in R-logical, numeric, integer, character, double, complex, raw, coercion, ls() command, expressions, variables and functions, control structures, Array, Matrix, Vectors, R packages.

**Unit – 4: Exploring data in R**

**15 Hours**

Data frames-data frame access, ordering data frames, R functions for data frames dim(), nrow(), ncol(), str(), summary(), names(), head(), tail(), edit() .Load data frames—reading from .CSV files, sub setting data frames, reading from tab separated value files, reading from tables.

**Unit – 5: Data Visualization using R:**

**15 Hours**

Reading and getting data into R (External Data): Excel files. **Working with R Charts and Graphs:** Histograms, Bar Charts, Line Graphs, Scatterplots, Pie Charts

**Books for Study:**

1. Seema Acharya, Subhashini Chellappan, Big Data and Analytics, Second Edition, Wiley
2. Seema Acharya, Data Analytics using R, McGraw Hill Education (India) Private Limited.

**Book for Reference:**

1. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, Raj Kamal, Preeti Saxena, McGraw Hill, 2018.
2. Big Data, Big Analytics: Emerging Business intelligence and Analytic trends for Today's Business, Michael Minelli, Michelle Chambers, and Ambiga Dhiraj, John Wiley & Sons, 2013
3. An Introduction to R, Notes on R: A Programming Environment for Data Analysis and Graphics. W. N. Venables, D.M. Smith and the R Development Core Team

## Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

## Course Outcomes

On successful completion of the course students will be able to

**CO1:** Ability to apply the concept of Big Data. (K4)

**CO2:** Ability to make decision using the concept in R programming (K3)

**CO3:** Apply R Programming concepts to create application decision making (K4)

**CO4:** Ability to apply statistical techniques using R Programming for data analytics (K4)

**CO5:** Students will be able to become data analyst (K5)

## Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs	
CO1	3	3	-	-	3	3	3	-	3	3	3	3	3	30	
CO2	3	3	-	-	3	2	3	-	3	3	3	3	3	29	
CO3	3	3	-	-	3	2	3	-	3	3	3	3	3	29	
CO4	3	3	-	-	3	2	3	-	3	3	3	3	3	29	
CO5	3	3	-	-	3	3	3	-	3	3	3	3	3	30	
<b>Grand total of COs with PSOs and POs</b>														<b>147</b>	
<b>Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(147/50)</b>														<b>and</b>	<b>2.94</b>

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.94
Observation	COs of Big Data Analytics using R – Strongly related with PSOs and POs		

**ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR - 625514**  
**DEPARTMENT OF COMPUTER SCIENCE**

Class : B. Sc. (Comp. Sci.)  
Semester : V  
Subject Code : 22UCSD25

Part : III – Core-12  
Hours : 75 Hours  
Credits: 05

**MOBILE COMPUTING**

**Objectives:**

The course enables the students to

- Understand the fundamentals of wireless and mobile communication
- Explore the functional components of Cellular and Telecommunication systems
- Explore Satellite systems and Digital Data Broadcast systems
- Understand Wireless Communication and their standard architectural models
- Identify suitable platform to deploy 5G systems for Mobile Communications

**UNIT – I INTRODUCTION**

**15 Hours**

History of Mobile Communication – Applications of wireless and mobile communication – Simplified Reference Model – wireless signal propagation – Multiplexing – Modulation – Spread Spectrum. **Medium Access Control:** Hidden and exposed terminals – Near and far terminals – Space Division Multiple Access – Frequency Division Multiple Access – Time Division Multiple Access – Code Division Multiple Access.

**UNIT – II TELECOMMUNICATION SYSTEMS**

**15 Hours**

**GSM:** Mobile Services – System Architecture – Radio Interface – Protocols – Localization Calling – Handover – Security **DECT:** System Architecture – Protocol Architecture – layers **TETRA:** Layers – Frame structures – Logical channels **UMTS:** UMTS System Architecture - UMTS Radio Interface – UTRAN – Core Network – Handover.

**Unit – III SATELLITE SYSTEMS**

**15 Hours**

History – Applications – typical system for global communications – basic system characteristics – Geostationary Earth Orbit – Medium Earth Orbit – Low Earth Orbit – High Elliptical Orbit – Localization – Handover. **Broadcast Systems:** Cyclical Repetition of Data – Digital Audio Broadcasting – Digital Video Broadcasting – Convergence of Broadcasting and Mobile Communication.

**UNIT – IV WIRELESS LAN**

**15 Hours**

Advantages – Disadvantages – Design Characteristics - **IEEE 802.11 family of WLANs:** System Architecture – Protocol Architecture **Bluetooth Systems:** Architecture – Radio layer – Base band layer – Link manager protocol **Mobile Network Layer:** DHCP – Mobile Ad-hoc Networks **Mobile Transport Layer:** Classical TCP improvements – TCP over 3G wireless networks.

**UNIT – V 5G MOBILE NETWORKS**

**15 Hours**

**System Architecture:** Functional Components – Supporting solutions – Control and User Plane Separation **Radio Networks:** Spectrum – Radio Access Technologies – Uplink and Downlink **Core Networks:** Network elements – Protocols and interfaces **Services and Applications:** 5G services – Vehicle Communications

**Book for Study**

1. Schiller Jochen, *Mobile Communications*, Second Edition, Pearson Education, 2008.
2. Jyrkit Penttinen, *5G Explained: Security and Deployment of Advanced Mobile Communications*, Wiley 2019.

**Books for Reference**

1. Mallick Martyn, *Mobile and Wireless Design Essentials*, Wiley Publishing, 2003

**Teaching Methods**

- Lecturing
- PPTs
- Learn by Debates
- Video Tutorials

**Course Outcomes**

On the successful completion of the course students will be able to  
**CO1:** Understand principles of Medium Access Control Management (K2)  
**CO2:** Compare and analyze Cellular architectures and their protocol suits (K4)  
**CO3:** Understand core ideas of broadcasting system based on Satellite Communication (K2)  
**CO4:** Identify suitable generic architecture for wireless LANs (K4)  
**CO5:** Explore tools and environment to practice 5G network systems (K5)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs&POs
CO1	3	2	-	-	3	2	2	-	3	1	3	2	3	24
CO2	3	2	-	-	3	2	2	-	3	1	3	2	3	24
CO3	3	2	-	-	3	2	2	-	3	1	3	2	3	24
CO4	2	3	-	-	3	2	2	-	3	1	3	2	3	24
CO5	2	2	-	-	3	2	2	-	3	1	3	2	3	23
<b>Grand total of COs with PSOs and Pos</b>														<b>119</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(119/50)</b>														<b>2.38</b>

**Strong -3, Medium -2, Low -1**

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.38
Observation	COs of Mobile Computing – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : B. Sc. (Comp. Sci.)

Part : III – Core-13

Semester : V

Hours : 75 Hours

Subject Code : 22UCSD35

Credits : 05

**DOT NET PROGRAMMING**

**Objectives;**

The course enables the students to

- Understand the HTML, CSS and ASP.NET Architecture.
- Build simple ASP.NET web applications.
- Apply server side controls to create webpage.
- Apply cookies and state management in web page.
- Apply ADO.Net to create dynamic web page.

**UNIT-I**

**15 Hours**

**Introducing .NET:** The Evolution of Web Development – HTML and HTML Forms, Server-Side Programming, Client-Side Programming - The .NET Framework- C#, and the .NET Languages, The Common Language Runtime, The .NET Class Library - The C# Language: C# Language Basics – Variables and Data Types – Variable Operations – Object-Based Manipulation - Conditional Logic – Loops – Methods.

**UNIT-II**

**15 Hours**

**Types, Objects, and Namespaces:** The Basics About Classes – Static Members, A Simple Class. Building a Basic Class – Creating an Object, Adding Properties, Automatic Properties, Adding a Method, Adding a Constructor, Adding an Event. Value Types and Reference Types – Understanding Namespaces and Assemblies – Advanced Class Programming. **Developing ASP.NET Applications:** The Promise of Visual Studio – Creating Websites – Designing a Web Page – The Anatomy of a Web Form – Writing Code – Visual Studio Debugging.

**UNIT-III**

**15 Hours**

**Web Form Fundamentals:** The Anatomy of an ASP.NET Application – Introducing Server Controls – HTML Server Controls, Converting an HTML Page to an ASP.NET Page, View State, The HTML Control Classes, Event Handling, Error Handling. The Page Class – Application Events – ASP.NET Configuration. **Web Controls:** Stepping Up to Web Controls – Web Control Classes – List Controls – Table Controls – Web Control Events and AutoPostBack – A Simple Web Page.

**UNIT-IV**

**15 Hours**

**Error Handling:** Exception Handling – Handling Exceptions. **State Management:** The Problem of State – View State – Transferring Information Between Pages – Cookies – Session State – Session State Configuration – Application State. **Validation:** Understanding Validation – The Validation Controls. **Rich Controls:** The Calendar – The AdRotator – Pages with Multiple Views.

**UNIT-V**

**15 Hours**

**Data Access with ADO.NET:** ADO.Net Architecture – Advantages - ADO.Net Objects. Handling Databases in code: Connection Class-Command Class – DataAdapter – DataSet Class – DataReader Class - DataTable Class - DataRow, DataColumn classes – DataRelation Class. Handling Data Manipulation in Code: Record Navigation - Record Updation - Inserting Record - Deleting Record.

### Book for Study

1. Matthew, MacDonald, Beginning ASP.NET in C# 2010, Après, 2013.

### Books for Reference

1. Dr. Sathiaselvan J.G.R., Sasikaladevi.N, Programming with c#.Net, Pearson Education Inc, 2009.
2. Matthew MacDonald, Freeman Adam, Pro ASP.NET 4 in C# 2010, Apress, 2010.
3. Walther Stephen, Hoffman Kevin and Dudek Nate, ASP.NET4 Unleashed, Pearson Education Inc, 2011.

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### Course Outcomes

On successful completion of the course students will be able to

**CO1:** Apply HTML,CSS in web forms to create a simple application. (K3)

**CO2:** Apply C# concepts to create a solution in asp.net application. (K3)

**CO3:** Build web application using web server controls.(K6)

**CO4:** Apply state management and cookies (K3)

**CO5:** Apply database connectivity to build web solutions. (K3).

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
<b>CO1</b>	3	3	-	-	3	3	3	-	3	3	3	3	3	30
<b>CO2</b>	3	3	-	-	3	2	3	-	3	3	3	3	3	29
<b>CO3</b>	3	3	-	-	3	2	3	-	3	3	3	3	3	29
<b>CO4</b>	3	3	-	-	3	2	3	-	3	3	3	3	3	29
<b>CO5</b>	3	3	-	-	3	3	3	-	3	3	3	3	3	30
<b>Grand total of COs with PSOs and POs</b>														<b>147</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(147/50)</b>														<b>2.94</b>

**Strong -3, Medium -2, Low -1**

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.94
Observation	COs of Dot Net Programming – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : B. Sc. (Comp. Sci.)

Part : III Core Lab-5

Semester : V

Hours : 75 Hours

Subject Code : 22UCSP55

Credits : 03

**DOT NET PROGRAMMING LAB**

**Objectives:**

The course enables the students to

- Create applications with HTML, CSS and ASP.NET Web controls.
- Develop programs with server controls and validation controls.
- Create applications with ADO.NET data controls.
- Apply data sources and working with data controls.

Create applications with Repeat layout property and directory property.

1. Write a program to display the following feedback form. The different options for the list box must be ASP-XML, DotNET, JavaPro and Unix,C, C++. Submit Form button is clicked after entering the data.
2. Write a program that displays a button in green color and it should change into yellow when the mouse moves over it.
3. Write a program containing the following controls: • A ListBox • A Button • An Image • A Label. The listbox is used to list the items available in a store. When the user clicks on an item in the listbox, its image is displayed in the image control. When the user clicks the button, the cost of the selected item is displayed in the control.
4. Extend the above program to add the following controls: • two labels • A TextBox • A Button One of the labels is displayed adjacent to the textbox, displaying the message "Enter the quantity:" When the user enters the quantity in the textbox and clicks the button, the total cost is evaluated and displayed in another label.
5. Write a program to get a user input such as the boiling point of water and test it to the appropriate value using CompareValidator.
6. Write a program that gets user input such as the user name, mode of payment, appropriate credit card. After the user enters the appropriate values the Validation button validates the values entered.
7. Create a RadioButtonList that displays the names of some flowers in two columns. Bind a label to the RadioButtonList so that when the user selects an option from the list and clicks on a button, the label displays the flower selected by the user.
8. Create table Employee in master database with the following columns and data types. Dept. Numeric Name Varchar(20) DojDatetime Sal Float Design Varchar(20) Write a program to connect to the master database in SQL Server, in the Page Load event. When the connection is established, the message "Connection has been established" should be displayed in a label in the form.

9. Select names from the employee table. Retrieve the result in a Dataset. Bind the Dataset to a RadioButtonList and display the result in three different forms as follows: The RepeatDirection property of the RadioButtonList is set to horizontal and its RepeatLayout property is set to Table.ii) The RepeatDirection property of the RadioButtonList is set to Vertical and its RepeatLayoutproperty is set to Table.iii) The RepeatLayout property of the RadioButtonList is set to flow.
10. Write a program to display the records and sorting of database.
11. Write a program to calculate EB Bill.

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### Course Outcomes

On successful completion of the course students will be able to

**CO1:** Develop applications with effective web programming (K6)

**CO2:** Create applications with web controls in ASP.NET (K6)

**CO3:** Create a Data Base application using ADO.NET Classes. (K6)

**CO4:** Create solutions using data controls to display table records in web forms. (K6)

**CO5:** Develop projects using ASP.NET framework (K6).

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	3	3	3	-	3	3	3	3	3	30
CO2	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO3	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO4	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO5	3	3	-	-	3	3	3	-	3	3	3	3	3	30
<b>Grand total of COs with PSOs and POs</b>														<b>147</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(147/50)</b>														<b>2.94</b>

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.94
Observation	COs of Dot Net Programming Lab – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE**

Class : B. Sc. (Comp. Sci.)  
Semester : V  
Subject Code : 22UCSD45

Part : III – Core-14  
Hours : 75 Hours  
Credits : 04

**NETWORK SECURITY AND CRYPTOGRAPHY**

**Course Objectives:**

The course enables the students to

- To understand the basic concepts of Data Science
- To understand the principles of algorithms, flowchart and source code
- To acquire a solid foundation in Python.
- To visualize data using plots in python
- To understand and handle database and visualize.

**Unit – I**

**15 Hours**

Introduction to Data Science – Evolution of Data Science – Data Science Roles – Stages in a Data Science Project – Applications of Data Science in various fields – Data Security Issues.

**Unit – II**

**15 Hours**

Data Collection and Data Pre-Processing Data Collection Strategies – Data Pre-Processing Overview – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization.

**Unit – III**

**15 Hours**

Exploratory Data Analytics Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis – Box Plots – Pivot Table – Heat Map – Correlation Statistics – ANOVA.

**Unit – IV**

**15 Hours**

Model Development Simple and Multiple Regression – Model Evaluation using Visualization – Residual Plot – Distribution Plot – Polynomial Regression and Pipelines – Measures for In-sample Evaluation – Prediction and Decision Making.

**Unit – V**

**15 Hours**

Model Evaluation Generalization Error – Out-of-Sample Evaluation Metrics – Cross Validation – Overfitting – Under Fitting and Model Selection – Prediction by using Ridge Regression – Testing Multiple Parameters by using Grid Search.

**Books for Study:**

1. Jojo Moolayil, “Smarter Decisions: The Intersection of IoT and Data Science”, PACKT, 2016.
2. Cathy O’Neil and Rachel Schutt, “Doing Data Science”, O’Reilly, 2015.

**Books for Reference:**

1. Ljubomir Perkovic (2012), Introduction to Computing Using Python: An Application Development Focus, John Wiley & Sons
2. John V Guttag(2013), Introduction to Computation and Programming Using Python“, Revised and expanded Edition, MIT Press.
3. Kenneth A. Lambert (2012), Fundamentals of Python: First Programs, C engage Learning

**Teaching Methods**

- Lecturing
- Group Discussions

- PPTs
- Learn by Doing
- Video Tutorials

### Course Outcomes

On the successful completion of the course students will be able to:

**CO1:** Understand Cryptography and Network Security concepts and applications. (K2)

**CO2:** Demonstrate and APPLY the process of Basic Concepts of Secure system design. (K3)

**CO3:** Identify and Analyse Network and Security Threat. (K4)

**CO4:** Understand the concepts of Asymmetric key cryptography (K2)

**CO5:** Evaluate the various Network Security protocols (K5)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	-	-	3	2	2	-	2	2	1	2	3	22
CO2	3	2	-	-	1	2	2	-	3	2	1	2	2	20
CO3	3	2	-	-	1	2	2	-	2	2	1	2	3	20
CO4	2	3	-	-	1	2	2	-	2	2	1	2	2	19
CO5	2	2	-	-	2	1	2	-	2	2	-	2	3	18
<b>Grand total of COs with PSOs and POs</b>														<b>99</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(99/49)</b>														<b>2.05</b>

**Strong – 3, Medium -2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.05
Observation	COs of Network Security and Cryptography – Medium related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : B. Sc. (Comp. Sci.)  
Semester : V  
Subject Code : 22UCSE15 (A)

Part : III Core Elective-1  
Hours : 45  
Credits : 03

**INTRODUCTION TO DATA SCIENCE**

**Course Objectives:**

The course enables the students to

- To understand the basic concepts of Data Science
- To understand the principles of algorithms, flowchart and source code
- To acquire a solid foundation in Python.
- To visualize data using plots in python
- To understand and handle database and visualize.

**Unit – I**

**9 Hours**

Introduction Introduction to Data Science – Evolution of Data Science – Data Science Roles – Stages in a Data Science Project – Applications of Data Science in various fields – Data Security Issues.

**Unit – II**

**9 Hours**

Data Collection and Data Pre-Processing Data Collection Strategies – Data Pre-Processing Overview – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization.

**Unit – III**

**9 Hours**

Exploratory Data Analytics Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis – Box Plots – Pivot Table – Heat Map – Correlation Statistics – ANOVA.

**Unit – IV**

**9 Hours**

Model Development Simple and Multiple Regression – Model Evaluation using Visualization – Residual Plot – Distribution Plot – Polynomial Regression and Pipelines – Measures for In-sample Evaluation – Prediction and Decision Making.

**Unit – V**

**9 Hours**

Model Evaluation Generalization Error – Out-of-Sample Evaluation Metrics – Cross Validation – Overfitting – Under Fitting and Model Selection – Prediction by using Ridge Regression – Testing Multiple Parameters by using Grid Search.

**Books for Study:**

1. Jojo Moolayil, “Smarter Decisions : The Intersection of IoT and Data Science”, PACKT, 2016.
2. Cathy O’Neil and Rachel Schutt , “Doing Data Science”, O'Reilly, 2015.

**Books for Reference:**

1. Ljubomir Perkovic (2012), Introduction to Computing Using Python: An Application Development Focus, John Wiley & Sons.

2. John V Guttag (2013), Introduction to Computation and Programming Using Python“, Revised and expanded Edition, MIT Press.
3. Kenneth A. Lambert (2012), Fundamentals of Python: First Programs, C engage Learning.

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### Course Outcomes

On the successful completion of the course students will be able to:

CO1: Explain the basic concepts of data science and its application (K2)

CO2: Create Python Program using Functions (K3)

CO3: Create and illustrate Numpy Libraries (K3)

CO4: Perform Data Manipulation using Pandas.(K4)

CO5: Create Data Visualization using Mat plot lib (K3)

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	3	3	3	-	3	3	3	3	3	30
CO2	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO3	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO4	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO5	3	3	-	-	3	3	3	-	3	3	3	3	3	30
<b>Grand total of COs with PSOs and POs</b>														<b>147</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(147/50)</b>														<b>2.94</b>

**Strong -3, Medium -2, Low -1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.94
Observation	COs of Introduction to Data Science – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR**

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : B. Sc. (Comp. Sci.)  
Semester : V  
Subject Code : 22UCSE15 (B)

Part : III Core Elective-2  
Hours : 45  
Credits : 03

**ARTIFICIAL NEURAL NETWORKS**

**Course Objectives:**

- To understand the biological neural network and to model equivalent neuron models.
- To understand the architecture, learning algorithms
- To understand the concept of Back Propagation
- To know the issues of various feed forward and feedback neural networks.
- To explore the Neuro dynamic models for various problems.

**Unit-I**

**9 Hours**

**Introduction:** A Neural Network, Human Brain, Models of a Neuron, Neural Networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks, Learning Process: Error Correction Learning, Memory Based Learning, Hebbian Learning, Competitive, Boltzmann Learning, Credit Assignment Problem, Memory, Adaption, Statistical Nature of the Learning Process.

**Unit-II**

**9 Hours**

**Single Layer Perceptron's:** Adaptive Filtering Problem, Unconstrained Organization Techniques, Linear Least Square Filters, Least Mean Square Algorithm, Learning Curves, Learning Rate Annealing Techniques, Perceptron –Convergence Theorem, Relation Between Perceptron and Bayes Classifier for a Gaussian Environment

Multilayer Perceptron: Back Propagation Algorithm XOR Problem, Heuristics, Output Representation and Decision Rule, Computer Experiment, Feature Detection

**Unit-III**

**9 Hours**

Back Propagation: Back Propagation and Differentiation, Hessian Matrix, Generalization, Cross Validation, Network Pruning Techniques, Virtues and Limitations of Back Propagation Learning, Accelerated Convergence, Supervised Learning

**Unit – IV**

**9 Hours**

Self-Organization Maps (SOM): Two Basic Feature Mapping Models, Self-Organization Map, SOM Algorithm, Properties of Feature Map, Computer Simulations, Learning Vector Quantization, Adaptive Patter Classification

**Unit-V**

**9 Hours**

Neuro Dynamics: Dynamical Systems, Stability of Equilibrium States, Attractors, Neuro Dynamical Models, Manipulation of Attractors as a Recurrent Network Paradigm  
Hopfield Models – Hopfield Models, restricted boltzmen machine.

**Books for Study**

1. Neural Networks a Comprehensive Foundations, Simon S Haykin, PHI Ed.
2. Introduction to Artificial Neural Systems Jacek M. Zurada, JAICO Publishing House Ed. 2006.

## Reference Book

1. Neural Networks in Computer Intelligence, Li Min Fu TMH 2013.

## Course Outcomes

Upon completing this course, the student will be able to

CO1: Understand the similarity of Biological networks and Neural networks(K2)

CO2: Understanding the concepts of Neural network (K2)

CO3: Perform the training of neural networks using various learning rules.(K4)

CO4: Understanding the concepts of forward and backward propagations.(K2)

CO5: Understand and Construct the Hopfield models.(K4)

## Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	3	3	3	-	3	3	3	3	3	30
CO2	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO3	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO4	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO5	3	3	-	-	3	3	3	-	3	3	3	3	3	30
<b>Grand total of COs with PSOs and POs</b>														<b>147</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(147/50)</b>														<b>2.94</b>

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.94
Observation	COs of Artificial Neural Networks– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR**

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : B. Sc. (Comp. Sci.) Part : III Core Elective-3  
Semester : V Hours : 45  
Subject Code: 22UCSE15 (C) Credits : 03

**LINUX SHELL PROGRAMMING**

**Course Outcomes:**

The course enables the students to

- Understand Linux and its utilizes
- Gain understanding of important aspects related to SHELL and the process
- Develop the ability to formulate regular expressions and use them for pattern matching
- Provide a comprehensive introduction to SHELL programming, service and utilizes
- Write Shell Programming using Linux commands

**Unit – I**

**9 Hours**

**INTRODUCTION TO LINUX AND LINUX UTILITIES:** A brief history of LINUX, architecture of LINUX, features of LINUX, introduction to vi editor. Linux commands- PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin. Text Processing utilities and backup utilities, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio

**Unit - II**

**9 Hours**

**Introduction to Shells:** Linux Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization. Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count Characters, Words or Lines, Comparing Files.

**Unit - III**

**9 Hours**

**Grep:** Operation, grep Family. **UNIX FILE STRUCTURE:** Introduction to UNIX file system, inode (Index Node). File Management :File Structures, System Calls for File Management – create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

**Unit - IV**

**9 Hours**

**PROCESS AND SIGNALS:** Process, process identifiers, process structure: process table, viewing processes, system processes, process scheduling, starting new processes: waiting for a process, zombie processes, orphan process, fork, vfork, exit, wait, waitpid, exec, signals functions, unreliable signals, interrupted system calls, kill, raise, alarm, pause, abort, system, sleep functions, signal sets.

**Unit - V****9 Hours**

**INTER PROCESS COMMUNICATION:** Pipe, process pipes, the pipe call, parent and child processes, and named pipes: fifos. **INTRODUCTION TO SOCKETS:** Socket, socket connections - socket attributes, socket addresses, socket, connect, bind, listen, accept, socket communications.

**Books for Study:**

1. W. Richard. Stevens (2005), Advanced Programming in the UNIX Environment, 3rd edition, Pearson Education, New Delhi, India.
2. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg.Thomson

**Books for References:**

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the UNIX environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. UNIX Network Programming, W.R. Stevens, PHI. UNIX for Programmers and Users, 3rd Edition, Graham Glass, King Ables, Pearson Education

**Course Outcomes:**

- CO1: Ability to use various Linux commands that are used to manipulate system operations at admin level and a prerequisite to pursue job as a Network administrator. (K3)
- CO2: Ability to write Shell Programming using Linux commands. (K4)
- CP3: Ability to design and write application to manipulate internal kernel level Linux File System. (K4)
- CO4: Ability to develop IPC-API's that can be used to control various processes for synchronization. (K5)
- CO5: Ability to develop Network Programming that allows applications to make efficient use of resources available on different machines in a network. (K5)

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	3	3	3	-	3	3	3	3	3	30
CO2	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO3	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO4	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO5	3	3	-	-	3	3	3	-	3	3	3	3	3	30
<b>Grand total of COs with PSOs and POs</b>														<b>147</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(147/50)</b>														<b>2.94</b>

Strong -3, Medium -2, Low -1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.94
Observation	COs of Linux And Shell Programming– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMPUTER SCIENCE**

**Class : B.Sc (Comp. Sci)**

**Part : Self Learning Course**

**Semester : V**

**Hours :**

**Subject code : 22UCSSL5**

**Credit : 03**

**SYSTEM ADMINISTRATION AND MAINTENANCE**

Objectives: The course enables the students to

- Gain knowledge about Operating System Installation and Configuration
- Understand the controlling processes of OS
- Gain knowledge about Operating System Maintenance
- To gain knowledge about the Output Devices
- Understand PC maintenance techniques and tools

**Unit-I**

Operating System Administration: Installation, Configuration, maintenance (service packs, patches, etc.) disk formatting/partitioning, installing Window/Linux, regular user vs super user

**Unit-II**

Controlling processes, user management, server administration and management, user and group management, backup management, security management

**Unit – III**

Operating System Maintenance: Linux distributions, Windows versions, PC hardware, BIOS, devices and drivers, system monitoring, Kernel configuration and building, applications installation, configuration, maintenance (Service packs, patches etc), server services (database, web, network services, etc, client services

**Unit-IV**

PC Maintenance: Creating Backup – Creating System Recovery – Removing unused File and Programs - Disk Cleanup – Disk Defragmenting – Maintenance Scheduling.

**Unit-V**

Network System Maintenance: Network configuration, network services, file printing on network, DHCP, DNS, FTP, HTTP, mail, SNMP, telnet

**Books for Study**

1. E. Siever, S. Figgins, Linux in a Nutshell, O’Reilly, Sixth Edition 2009
2. T. Batts, T. Dawson, G.N. Purdy, Linux Network Administrator’s Guide, O’Reilly, Third Edition

**Books for Reference**

1. A. Basta, W. Halton, Computer Security: Concepts, Issues and Implementation, Cengage Learning India

**Course Outcome (CO)**

On successful completion of the course students will be able to

CO1: Install Window/Linux Operating System

CO2: Understand the controlling processes

CO3: Maintain the Operating System

CO4: Maintain the Personal Computer

CO5: Understand the Network Concepts

<b>Objectives</b>	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	<b>Sum of COs with PSOs &amp; POs</b>
<b>Outcome</b>														
CO1	2	1	2	1	1	3	2	-	-	2	1	1	-	16
CO2	2	2	2	1	1	3	2	-	-	2	2	2	-	19
CO3	3	3	2	1	2	3	3	-	-	2	3	3	-	25
CO4	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO5	3	3	3	1	2	3	3	-	-	2	2	2	-	24
	Grand Total of COs with POs PSOs													104
	<b>Grand total with PSOs and POs</b> <b>Mean value of COs with PSO and POs = <math>\frac{104}{50}</math> = (104/50)</b> <b>Number of COs relating with PSOs &amp; POs</b>													<b>2.08</b>

Strong – 3, Medium – 2, Low – 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.08
Observation	COs of System Administration and Maintenance – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE**

Class : B. Sc. (Comp. Sci.)  
Semester : VI  
Subject Code : 22UCSD56

Part : III – Core-15  
Hours : 75 Hours  
Credits : 04

**SOFTWARE ENGINEERING**

**Objectives:**

The course enables the students to

- Understand the basic software engineering design concepts and principles.
- Analyze various cost estimation techniques.
- Explore formal specification techniques and design concepts.
- Illustrate various design notations and project guidelines.
- Describe verification & validations and managerial techniques.

**Unit I**

**15 Hours**

**Introduction to software engineering:** Definitions – Size Factors – Quality and productivity factors. Planning a software project: planning the Development process-planning an organizational structure.

**Unit II**

**15 Hours**

**Software cost Estimation:** Software cost Factors - Software cost Estimation Techniques - Staffing-Level Estimation - Estimating Software Estimation Costs.

**Unit III**

**15 Hours**

**Software Requirements Specification:** Definition – Formal Specification Techniques. Software Design: Fundamental Design Concepts – Modules and Modularization Criteria.

**Unit IV**

**15 Hours**

**Designing the System:** Design Introduction – Decomposition and Modularity – Architectural styles and strategies – Characteristics of good design – Techniques for improving design – Design evaluation and validation – Documenting the design – Programming standards and procedures – Programming guidelines – Documentation.

**Unit V**

**15 Hours**

**Verification and Validation Techniques:** Quality Assurance- Walkthroughs and Inspections - Unit Testing and Debugging - System Testing. Software Maintenance: Enhancing Maintainability during Development - Managerial Aspects of Software Maintenance - Configuration Management.

**Book for Study**

1. Richard Fairley, *Software Engineering Concepts*, Fifth Edition, 2017, TMH.

**Books for Reference**

1. Sommerville Ian, *Software Engineering*, Tenth Edition, 2018, PHI.
2. Mall Rajib, *Fundamentals of Software Engineering*, Third Edition, 2014, PHI.
3. Schach Stephen, *Software Engineering*, Seventh Edition, 2007, TMH.

**Teaching Methods**

- Lecturing
- PPTs and PDF
- Case Studies
- Video Tutorials

**Course Outcomes:**

On successful completion of the course students will be able to

**CO1:** Understand the basic project design concepts and principles. (K2)

**CO2:** Apply varies cost estimation techniques in real time projects. (K3)

**CO3:** Analyze varies formal specification techniques in projects. (K4)

**CO4:** Prepare the project using proper guidelines and design notations. (K5)

**CO5:** Generate test cases validation and verifications techniques. (K6)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	2	2	-	-	2	3	2	1	3	2	3	1	3	24
CO2	2	2	-	-	2	2	1	2	3	3	2	2	3	24
CO3	3	2	-	-	2	3	1	1	3	3	2	2	3	25
CO4	2	2	-	-	1	2	2	-	2	3	2	1	2	19
CO5	2	2	-	-	2	3	2	1	3	2	3	1	3	24
<b>Grand total of COs with PSOs and POs</b>														<b>116</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(116/54)</b>														<b>2.14</b>

**Strong – 3, Medium -2, Low – 1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.14
Observation	COs of Software Engineering – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE**

Class : B. Sc. (Comp. Sci.)  
Semester : VI  
Subject Code : 22UCSD66

Part : III – Core-16  
Hours : 60 Hours  
Credits : 04

**DATA MINING AND WAREHOUSING**

**Objectives:**

The course enables the students to

- Understand the basic concepts of data mining techniques and algorithms.
- Know about the decision tree and classification rules.
- Understand cluster analysis and its types.
- Know the web mining and ranking of web pages.
- Understand the data warehousing backend processes.

**UNIT – I**

**12 Hours**

What is Data Mining - The data mining process –software Development Approaches – The future of Data Mining-Data Collection and Pre-processing- Outliers- Mining Outliers- Missing Data- Types of Data.

**UNIT – II**

**12 Hours**

Introduction: Data mining application – data mining techniques - Association rules mining: Introduction basics- task and a naïve algorithm- Apriori algorithm - mining frequent pattern without candidate generation (FP-growth Classification : Introduction – decision tree – over fitting and pruning -- naïve Bayes method.

**UNIT – III**

**12 Hours**

Cluster analysis: cluster analysis – types of data – computing distances-types of cluster analysis methods - partitioned methods – hierarchical methods – density based methods – dealing with large databases – quality and validity of cluster analysis methods.

**UNIT – IV**

**12 Hours**

Web data mining: Introduction- web terminology and characteristics- locality and hierarchy in the web- web content mining-web usage mining- web structure mining – web mining software - Search engines: Search engines functionality- search engines architecture – ranking of web pages.

**UNIT – V**

**12 Hours**

Data warehousing: Introduction – Operational data sources- data warehousing - Data warehousing design – Guidelines for data warehousing implementation - Data warehousing metadata - Online analytical processing (OLAP): Introduction – OLAP characteristics of OLAP system – Multidimensional view and data cube - Data cube implementation - Data cube operations OLAP implementation guidelines.

**Book for Study**

1. G.K. Gupta, *Introduction to Data mining with case studies*, Third Edition, PHI Learning Pvt. Ltd., New Delhi, 2014

**Books for Reference**

1. PujariArun K , *Data Mining Techniques*, Universities Press, 2001.
2. Han Jiawei, KamberMicheline, Pei Jian, *Data Mining Concepts and Techniques*, Third Edition, Morgan Kuffman, 2011.

**Teaching Methods**

- Lectures
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

**Course Outcomes:**

On successful completion of the course students will be able to

**CO1:** Understand the basic concepts of Data Mining Techniques and Algorithms (K2)

**CO2:** Identify appropriate data mining algorithms to solve real world problems (K3)

**CO3:** Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining (K4)

**CO4:** Understand the Web Mining and ranking the web pages. (K2)

**CO5:** Understand Data Warehouse fundamentals and apply OLAP operations (K3)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

**Mapping Course outcome with PO and PSO**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
<b>CO1</b>	3	2	-	-	2	3	2	1	3	2	3	1	3	25
<b>CO2</b>	3	2	-	-	2	2	1	2	3	3	2	2	3	25
<b>CO3</b>	3	2	-	-	2	3	1	1	3	3	2	2	3	25
<b>CO4</b>	3	2	-	-	1	2	2	-	2	3	2	1	2	20
<b>CO5</b>	3	2	-	-	2	3	2	1	3	2	3	1	3	25
<b>Grand total of COs with PSOs and POs</b>														
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(120/54)</b>														<b>2.22</b>

**Strong - 3, Medium - 2, Low –1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.22
Observation	COs of Data Mining and Warehousing – Strongly related with PSOs and POs		

**ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR – 625514**

**DEPARTMENT OF COMPUTER SCIENCE**

Class : B. Sc. (Comp. Sci.)

Part : III – Core-17

Semester : VI

Hours : 75 Hours

Subject Code : 22UCSD76

Credits : 04

**MOBILE APPLICATION DEVELOPMENT**

**Objectives:**

The course enables the students to

- Understand the basic concepts of JAVA Language for Mobile app Development
- Know about the mobile application development languages.
- Understand the Application models of mobile application frameworks
- Know the User-interface design for mobile applications
- Managing application data using database

**Unit - I**

**15 Hours**

Introduction to java – Introducing Java Dalvik Virtual Machine – Developing Simple Java Program – Working with java Tokens-Knowledge Check -1 –Explaining Data Types-Declaring Variables – Declaring Classes – Declaring Methods –Creating Objects –Explaining Access Specifiers- Interfaces – Inheritance –Implementing Flow control statements-Using Selection statements-using Iteration statements-Using jump statements.

**Unit - II**

**15 Hours**

What is Android, Android versions and its feature set The various Android devices on the market , The Android Market application store , Android Development Environment - System Requirements, Android SDK, Installing Java, and ADT bundle - Eclipse Integrated Development Environment (IDE), Creating Android Virtual Devices (AVDs).

**Unit - III**

**15 Hours**

The Android Software Stack, The Linux Kernel, Android Runtime - Dalvik Virtual Machine, Android Runtime – Core Libraries, DalvikVM Specific Libraries, Java Interoperability Libraries, Android Libraries, Application Framework, Creating a New Android Project ,Defining the Project Name and SDK Settings, Project Configuration Settings, Configuring the Launcher Icon, Creating an Activity, Running the Application in the AVD, Stopping a Running Application, Modifying the Example Application, Reviewing the Layout and Resource Files.

**Unit IV**

**15 Hours**

Designing for Different Android Devices, Views and View Groups, Android Layout Managers, The View Hierarchy, Designing an Android User Interface using the Graphical Layout Tool, Displaying Text with TextView, Retrieving Data from Users, Using Buttons, Check Boxes and Radio Groups, Getting Dates and Times from Users, Using Indicators to Display Data to Users, Adjusting Progress with SeekBar, Working with

Menus using views, Displaying Pictures - Gallery, ImageSwitcher, GridView, and ImageView views to display images, Creating Animation.

### Unit V

15 Hours

Saving and Loading Files, SQLite Databases, Android Database Design, Exposing Access to a Data Source through a Content Provider, Content Provider Registration, Native Content Providers Intents and Intent Filters- Intent Overview, Implicit Intents, Creating the Implicit Intent Example Project, Explicit Intents, Creating the Explicit Intent Example Application, Intents with Activities, Intents with Broadcast Receivers.

### Books for Study

1. DarceyLauren, Conder Shane, *Android Wireless Application Development*, Second Edition, Pearson Education.
2. RogersRick, Lombardo John, MednieksZigurd, Meike Blake, *Android Application Development*, O'Reilly, Shroft Publishers & Distributors Pvt Ltd, New Delhi, 2010.
3. Pradeep Kothari, *Android Application Development (with Kit Kat support)* Black Book, Dreamtech Press, 2019.

### Books for Reference

1. Meier Reto, *Professional Android 2 Application Development*, Wiley India Pvt Ltd
2. Murphy Mark L, *Beginning Android*, Wiley India Pvt Ltd
3. HashimiSayed Y, KomatineniSatya, MacLean Dave, *Pro Android*, Wiley India Pvt Ltd

### Teaching Methods

- Lectures
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

### Course Outcomes:

On the successful completion of the course students will able to

**CO1:** Understand the programming concepts of java (K1)

**CO2:** Understand the characterization and architecture of mobile applications (K2)

**CO3:** Competent with understanding enterprise scale requirements of mobile applications (K2).

**CO4:** Designing and developing mobile applications using one application development framework (K3)

**CO5:** Manage data in the application operations and implementations. (K3)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	-	-	3	3	3	1	3	3	3	1	2	28
CO2	3	3	-	-	3	2	3	1	3	3	3	1	2	27
CO3	3	3	-	-	3	2	3	1	3	3	3	1	1	26
CO4	3	3	-	-	3	2	3	1	3	3	3	1	1	26
CO5	3	3	-	-	3	3	3	2	3	3	3	1	2	29
<b>Grand total of COs with PSOs and POs</b>														<b>136</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(136/55)</b>														<b>2.47</b>

**Strong - 3, Medium - 2, Low - 1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.47
Observation	COs of Mobile Application Development – Strongly related with PSOs and POs		

**ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR – 625514**  
**DEPARTMENT OF COMPUTER SCIENCE**

Class : B. Sc. (Comp. Sci.)  
Semester : VI  
Subject Code : 22UCSD86

Part : III – Core-18  
Hours : 75 Hours  
Credits : 03

**PYTHON PROGRAMMING**

**Objectives:**

The course enables the students to

- make students understand the concepts of Python programming
- provide solutions using control structures in Python programming
- apply the knowledge functions, strings and modules in Python based solutions
- learn the various element-based data types in Python programming
- work with file-based operations with Python

**UNIT I: Fundamentals of Python**

**15 Hours**

**Basics of Python Programming:** History of Python-Features of Python-Literal-Constants- Variables – Identifiers – Keywords-Built-in Data Types – Output Statements – Input Statements – Comments – Indentation – Operators-Expressions-Type conversions. **Python Arrays:** Defining and Processing Arrays – Array methods.

**UNIT II: Control Statements**

**15 Hours**

**Control Statements:** Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. **Iterative Statements:** While loop, For loop, Else suite in loop and Nested loops. **Jump Statements:** Break, Continue and Pass statements.

**UNIT III: Functions in Python**

**15 Hours**

**Functions:** Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. **Function Arguments:** Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments – Recursion. **Python Strings:** String operations- Immutable Strings – Built-in String Methods and Functions - String Comparison. **Modules:** import statement- The Python module – dir() function – Modules and Namespace – Defining our own modules.

**UNIT IV: Lists and Dictionaries**

**15 Hours**

**Lists:** Creating a list -Access values in List-Updating values in Lists-Nested lists -Basic list operations-List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples– Difference between lists and tuples. **Dictionaries:** Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.

**UNIT V: File Handling**

**15 Hours**

Types of files in Python - Opening and Closing files-Reading and Writing files: write() and writelines() methods- append() method – read() and readlines() methods – with keyword – Splitting words – File methods - File Positions- Renaming and deleting files.

### Books for Study

1. Thareja, R. (2017). *Python programming using problem solving approach* (1st ed.). Oxford University Press.
2. Rao, N. R. (2017). *Core Python programming* (1st ed.). Dream Tech Publishers.

### Books for Reference

1. Kurama, V. (2018). *Python programming: A modern approach*. Pearson Education.
2. Lambert, K. A. (2017). *Fundamentals of Python – First programs*. CENGAGE Publication.

### Web Sources

1. <https://www.programiz.com/python-programming>
2. <https://www.guru99.com/python-tutorials.html>
3. [https://www.w3schools.com/python/python\\_intro.asp](https://www.w3schools.com/python/python_intro.asp)
4. <https://www.geeksforgeeks.org/python-programming-language>
5. [https://en.wikipedia.org/wiki/Python\\_\(programming\\_language\)](https://en.wikipedia.org/wiki/Python_(programming_language))

### Teaching Methods

- Lectures
- Demonstration
- PPTs
- Learn by Doing
- Video Tutorials

### Course Outcomes

On the successful completion of the course the students will able to

**CO1:** Recall simple Python programs that solve basic problems (K1)

**CO2:** Explain the basic concepts of Python programming (K2)

**CO3:** Use Python to interact with the operating system and other external resources (K3)

**CO4:** Analyse and apply solutions to problems by using various Python techniques (K4)

**CO5:** Develop reusable and maintainable Python software (K5)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

### Mapping Course outcome with PO and PSO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO2	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO3	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO4	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO5	3	3	-	-	2	3	2	2	3	2	3	3	3	30
Grand total of COs with PSOs and POs														150
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(150/55)														2.72

Strong - 3, Medium - 2, Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.72
Observation	COs of Open Source Technologies – Strongly related with PSOs and POs		

**ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR – 625514**

**DEPARTMENT OF COMPUTER SCIENCE**

Class : B. Sc. (Comp. Sci.)

Part : III – Core Lab-6

Semester : VI

Hours : 75 Hours

Subject Code : 22UCSP66

Credits: 03

**PYTHON PROGRAMMING LAB**

**Objectives:**

The course enables the students to

- make students understand the concepts of Python programming
- provide solutions using control structures in Python programming
- apply the knowledge functions, strings and modules in Python based solutions
- learn the various element-based data types in Python programming
- work with file-based operations with Python

**List of Exercises**

1. Program to demonstrate basic operations
2. Program using control statement
3. Program using user defined functions
4. Program to demonstrate string manipulation
5. Program using lists
6. Program using tuples
7. Program using Dictionaries
8. Program using File Manipulations
9. Program to demonstrate exception handling
10. Programs using classes and objects
11. Program using databases
12. Program to implement Socket programming
13. Program to demonstrate GUI programming
14. Program to demonstrate web programming

**Course Outcomes**

On the successful completion of the course the students will able to

**CO1:** Apply the basic concepts of programming using Python

**CO2:** Construct the program using built in functions of List and string

**CO3:** Test for mapping using Dictionary

**CO4:** Asses the execution speed of the program using recursion

**CO5:** Demonstrate Database and Networking Connectivity

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

**Teaching Methods**

- Lectures
- Demonstration
- PPTs
- Learn by Doing
- Video Tutorials

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	3	3	2	2	-	-	3	3	-	3	3	28
CO2	3	2	3	3	2	3	-	-	3	2	-	3	3	27
CO3	3	2	2	3	2	3	-	-	3	2	-	3	3	26
CO4	3	2	2	3	2	3	-	-	3	2	-	3	3	26
CO5	3	2	2	3	2	3	-	-	3	2	-	3	3	26
<b>Grand total of COs with PSOs and Pos</b>														<b>131</b>
<b>Grand total with PSOs and POs</b> <b>Mean value of COs with PSOs and POs = <math>\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \&amp; POs}} = (131/50)</math></b>														<b>2.62</b>

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.62
Observation	COs of Python Programming Lab – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR  
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : B.Sc (Comp.Sci)  
Semester : VI  
Subject Code : 22UCSD96

Part : Core -19  
Hours : 15  
Credit : 2

**PROJECT WORK**

**Objectives:**

**The course enables the students to**

**CEO1:** Understand and Plan the real problem of the Project.

**CEO2:** Analyze the problem.

**CEO3:** Design the Project.

**CEO4:** Implement the Project.

**CEO5:** Configured and Test the Project.

**Guidelines**

- All the students are expected to choose project in IT Related Company/Industry/real project in schools/College/any authorized organization/Institutions.
- Each student will be allocated guide/supervisor by the department for smooth/best way to complete the project.
- All the students are expected to submit attendance and company undertaking and project completion certificate during the period of project allotted duration.
- Three copies of the thesis/record note book must be submitted to the department duly signed by guide/supervisor and Head of the Department.

**Examination/ Evaluations**

The thesis/record notebook will be evaluated by the internal examiner and external examiner who are appointed by the Office of the Controller of Examination. The candidate also will be evaluated based on viva-voce and presentation of the thesis/record notebook and will be graded as shown below.

Excellent	85% and above
Very Good	75% and above but below 85%
Good	60% and above but below 75%
Satisfactory	50% and above but below 60%
Rejected	Less than 50%

**Course Outcomes (CO):**

On successful completion of the course students will be able to

**CO1:** Identify and plan the real problem of the Project. (K2)

**CO2:** Analyze the problem of the Project. (K4)

**CO3:** Apply and Design the Project. (K3)

**CO4:** Implement the Project. (K5)

**CO5:** Create the Project. (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	2	-	1	3	1	-	3	3	2	3	3	26
CO2	3	2	2	-	2	3	1	-	3	3	2	3	3	27
CO3	3	2	3	-	2	3	1	-	3	3	2	3	2	27
CO4	2	3	3	-	2	3	1	-	2	2	2	2	3	25
CO5	3	3	3	-	2	2	1	-	3	3	2	3	2	27
<b>Grand total of COs with PSOs and POs</b>														<b>132</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(132/55)</b>														<b>2.40</b>

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.40
Observation	COs of Project Work – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)- KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**INTERNET OF THINGS**

Class : B. Sc. (Comp. Sci.)  
Semester : VI  
Subject Code : 22UCSE26 (A)

Part : Core Elective -2  
Hours : 45  
Credits: 03

**Objectives:**

The course enables the students to

- Understand the Basic concepts in IoT
- Analyze various IoT Devices
- Understand the Functions of Data and Human Interaction with IoT
- Understand the scope of IoT Applications
- Analyze various case studies in IoT Applications

**Unit – I: Introduction to IOT**

**9 Hours**

Definition of the Internet of Things - main assumptions and perspectives- Platform for IoT devices - Economics and Technology of the IoT –Issues in IoT and solutions-Architecture of IoT.

**Unit - II IOT Devices**

**9 Hours**

Temporary and Ad-hoc devices-Addressing issues-End devices in dedicated networks- Small data Building a web of things-Autonomy and co-ordination-Structuring a tree-Housekeeping message-Role of integrator function-Degrees of functionality.

**Unit - III Data and Human Interaction:**

**9 Hours**

Functions of IoT-Analysis and control-Neighborhood - Human interface and control points- Collaborative scheduling tools-Packaging and provisioning- Distributed integrator functions- Filtering the streams-IP Alternative-Protocol based on category classification.

**Unit - IV IOT Applications:**

**9 Hours**

Moore’s Law –Intelligence near the edge- Incorporating legacy devices- Staying in the loop -Social machines-Efficient process control-Factory application- Natural sciences- Living applications- Shared software and business process vocabularies.

**Unit – V Case Studies Illustrating IOT Design**

**9 Hours**

Home Automation - Cities - Environment - Agriculture - Productivity Applications

**Books for Study:**

1. Da Francis, Costa, *Rethinking the Internet of Things-A scalable approach to connecting everything*, 2013, Apress open publication.
2. WaherPeter, *Learning Internet of Things*, 2015, PACKT Publishing-Birmingham-Mumbai.

**Books for Reference:**

1. Bahga Arhdee, Madiseti Vijay, *Internet of Things: A Hands on Approach* (<http://www.internet-of-things-book.com/>). 2015.
2. PfisterCuno, *Getting started with the Internet of Things*, O’Rielly Publication.2011.

**Web Reference:**

1. Introduction to IoT: <https://www.javatpoint.com/iot-internet-of-things>
2. Architecture of IoT : <https://www.geeksforgeeks.org/architecture-of-internet-of-things-iot/>
3. IoT Devices : [https://www.tutorialspoint.com/internet\\_of\\_things/index.htm](https://www.tutorialspoint.com/internet_of_things/index.htm)
4. Advanced IoT Applications : <https://nptel.ac.in/courses/108108123>
5. IoT Human Interaction : <https://www.digimat.in/nptel/courses/video/106106177/L01.html>
6. IoT designs : <https://nlist.inflibnet.ac.in/search/Record/EBC5332124>

**Teaching Methods**

- Lecturing
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

**Course Outcomes**

On the successful completion of the course students will be able to:

**CO1:** Understand the basic concepts in IoT. (K2)

**CO2:** Analyze various IoT Devices. (K4)

**CO3:** Understand Data and Human Interaction concepts in IoT. (K3)

**CO4:** Develop IoT Applications for real time applications. (K3)

**CO5:** Analyze various case studies in IoT Applications. (K4)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

**Mapping Course Outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
<b>CO1</b>	3	3	2	1	-	3	-	-	2	3	-	3	2	22
<b>CO2</b>	3	3	2	1	-	2	-	-	3	2	-	3	3	22
<b>CO3</b>	2	3	2	2	-	3	-	-	2	3	-	2	2	21
<b>CO4</b>	3	2	3	1	-	3	-	-	3	3	-	3	3	24
<b>CO5</b>	3	3	2	1	-	3	-	-	3	2	-	2	2	21
<b>Grand total of COs with PSOs and POs</b>														<b>110</b>
Grand total with PSOs and POs Mean value of COs with PSO and POs = _____ = (110/45) Number of COs relating with PSOs& POs														<b>2.40</b>

**Strong – 3, Medium -2, Low - 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.40
Observation	COs of Internet of Things – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)- KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**ARTIFICIAL INTELLIGENCE**

Class : B. Sc. (Comp. Sci.)  
Semester : VI  
Subject Code : 22UCSE26 (B)

Part : Core Elective - 2  
Hours : 45  
Credits: 03

**Objectives:**

The course enables the students to

- Understand the Basic concepts in AI
- Analyze various Searching Techniques
- Understand the Knowledge Representation
- Understand the Various Logic in AI
- Analyze various case studies in AI Applications

**Unit - 1**

**9 Hours**

AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

**Unit - II**

**9 Hours**

Searching- Searching for solutions, uniformed search strategies – Breadth first search, depth first Search. Search with partial information (Heuristic search) Hill climbing, A\* ,AO\* Algorithms, Problem reduction, Game Playing-Adversial search, Games, mini-max algorithm, optimal decisions in multiplayer games, Problem in Game playing, Alpha-Beta pruning, Evaluation functions.

**Unit – III**

**9 Hours**

Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems. Reasoning under uncertainty, review of probability, Baye’s probabilistic interferences and dempstershafer theory.

**Unit - IV**

**9 Hours**

First order logic. Inference in first order logic, propositional vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution, Learning from observation Inductive learning, Decision trees, Explanation based learning, Statistical Learning methods ,Reinforcement Learning.

**Unit - V**

**9 Hours**

Expert systems:- Introduction, basic concepts, structure of expert systems, the human element in expert systems how expert systems works, problem areas addressed by expert systems, expert systems success factors, types of expert systems, expert systems and the internet interacts web, knowledge engineering.

**Book for Study:**

1. S. Russel and P. Norvig, “Artificial Intelligence – A Modern Approach”, Second Edition, Pearson Education

**Reference Books:-**

1. David Poole, Alan Mackworth, Randy Goebel, “Computational Intelligence : a logical approach”, Oxford University Press.
2. G. Luger, “Artificial Intelligence: Structures and Strategies for complex problem-solving”, Fourth Edition, Pearson Education.
3. J. Nilsson, “Artificial Intelligence: A new Synthesis”, Elsevier Publishers.

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

### Course Outcomes

On the successful completion of the course students will be able to:

**CO1:** Understand the Basic concepts in AI. (K2)

**CO2:** Analyze various Searching Techniques. (K4)

**CO3:** Understand the Knowledge Representation. (K3)

**CO4:** Understand the Various Logic in AI. (K3)

**CO5:** Analyze various case studies in AI Applications. (K4)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

### Mapping Course Outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	2	1	-	3	-	-	2	3	-	3	2	22
CO2	3	3	2	1	-	2	-	-	3	2	-	3	3	22
CO3	2	3	2	2	-	3	-	-	2	3	-	2	2	21
CO4	3	2	3	1	-	3	-	-	3	3	-	3	3	24
CO5	3	3	2	1	-	3	-	-	3	2	-	2	2	21
<b>Grand total of COs with PSOs and POs</b>														<b>110</b>
<b>Grand total with PSOs and POs</b>														
Mean value of COs with PSO and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}} = \frac{110}{45}$														<b>2.40</b>

**Strong – 3, Medium -2, Low - 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.40
Observation	COs of Internet of Things – Strongly related with PSOs and POs		

**ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR – 625514**

**DEPARTMENT OF COMPUTER SCIENCE**

Class : B. Sc. (Comp. Sci.)

Part : III Core Elective-2

Semester : VI

Hours : 45 Hours

Subject Code : 22UCSE26 (C)

Credits: 03

**Software Testing**

**Objectives:**

The course enables the students to

- Understand the software development models
- Understand the functionality, security, performance, and other aspects of an application
- Understand the methods for the software's stability and checks for flaw.
- Understand the testing functionality for speed, responsiveness and stability requirements
- Understand the testing functionality software's quality and performance

**UNIT I :** Software Development Life Cycle models: phases of software project – Quality, Quality Assurance, Quality control- Testing, verification and validation- process model to represent Different phases- Life cycle models. White-Box Testing: static testing- structural Testing –challenges in white-Box testing.

**UNIT II:** Black-Box Testing: Introduction to Black Box Testing - challenges in Black Box Testing – Integration Testing: Integration Testing as type of Testing- Integration Testing as a phase of Testing - Scenario Testing- Defect Bash.

**UNIT III:** System and Acceptance Testing: system testing overview- Why system testing is done? Functional versus Non-functional Testing- Nonfunctional Testing-Acceptance Testing- summary of Testing phases.

**UNIT IV:** Performance Testing: Factors governing performance Testing- Methodology of performance Testing- tools for performance testing-process for performance Testing- challenges. Regression Testing: What is Regression Testing?-types of Regression Testing- When to do Regression Testing- How to do Regression Testing-Best practices in regression testing.

**UNIT V:** Test planning, Management, Execution and Reporting: Test planning-Test Management- Test process-Test Reporting-Best practices. Test Metrics and Measurements: project metrics- progress Metrics- Release Metrics.

**Text Book:**

1. Boris Beizer, "Software Testing Technologies", Dreamtech Publication, Edition 2006.

**Reference Books:**

1. Glenford J. Myers, "The Art of Software Testing", John Wesley & Sons, 1999.
2. Roger S. Pressman, "Software Engineering", Tata McGraw-Hill, 6<sup>th</sup> Edition 2005.

**Teaching Methods:**

- Lectures
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

**Course Outcomes:**

On the successful completion of the course students will able to

1. CO1: Apply various software testing model for real time projects (K3)
2. CO2: Evaluate the functionality, security, performance, and other aspects of an application (K5)
3. CO3: Apply various methods for the software's stability and checks for flaw. (k3)
4. CO4: Apply testing functionality for speed, responsiveness and stability requirements (k3)
5. CO5: Understand the testing functionality software quality and performance

**K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create**

**Mapping**

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of Cos with PSOs&Pos
Outcome														
CO1	1	1	2	-	-	3	3	-	1	2	2	2	-	17
CO2	2	2	2	-	1	3	3	-	2	2	2	2	-	21
CO3	3	3	2	-	2	3	3	-	1	3	3	3	-	26
CO4	3	2	2	-	1	3	3	-	2	2	3	1	-	22
CO5	3	3	3	-	2	3	3	-	1	2	3	2	-	25
	Grand Total of Cos with POs and PSOs													111
	Grand total with PSOs and POSs Mean value of Cos with PSO and POs = $\frac{111}{49}$ = (111/49) Number of Cos relating with PSOs& POs													2.26

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.26
Observation	COs of Software Testing – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMPUTER SCIENCE**

**Class : B.Sc (Comp.Sci)**

**Part : Self Learning Course**

**Semester : VI**

**Hours :**

**Subject code : 22UCSSL6**

**Credit : 03**

**ETHICAL HACKING**

**Objectives:**

On Successful completion of the course the students should

- Know about hackers and their working style
- Learn about Email Hacking
- Learn about detection and removal of Trojans
- Learn about Mobile Hacking
- Understand the Penetration Testing

**Unit -I Concept of Ethical Hacking**

Introduction, What is hacking? Hackers, types of hackers, why hackers hack? Prevention from hacker, steps performed by hackers, working of ethical hacker

**Unit – II Email Hacking**

How email works? Email service protocol's, Email Security, email spoofing, Methods to send fake Emails, email spamming, phishing, prevention from phishing, email tracing, keystroke loggers

**Unit -III Trojans**

Introduction, types of Trojans, components of Trojan, mode of Transmission for Trojans, detection and Removal, Counter measures.

**Unit IV Mobile Hacking**

Introduction, Call Spoofing/forging, SMS Forging, Bluesnarfing. Sniffers What is Sniffers? Defeating Sniffers, Ant Sniff

**Unit -V Penetration Testing**

What is Penetration Testing? Introduction, Setting the Stage, Introduction to Kali and Backtrack Linux: Tools. Lots of Tools, Working with Your Attack Machine: Starting the Engine, The Use and Creation of a Hacking Lab, Phases of a Penetration Test

**Books for Study**

1. "Hacking for Beginners" by Manthan Desai, 2010
2. "The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy" second Edition by Patrick Engebretson, ELSEVIER.

**Books for Reference**

1. Daniel G. Graham, Ethical Hacking: A Hands-on Introduction to Breaking In, No Starch Press, 2021

**Course Outcomes**

CO1: Gain knowledge about hackers (K2)

CO2: Understand various types of E-Mail Hacking (K2)

CO3: Apply methods to detect and removal of Trojans(K3)

CO4: Understand various types of Mobile Hacking(K2)

CO5: Apply penetration testing to find and exploit vulnerabilities in a computer system(K3)

**Mapping**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	-	-	3	2	2	-	2	2	1	2	3	22
CO2	3	2	-	-	1	2	2	-	3	2	1	2	2	20
CO3	3	2	-	-	1	2	2	-	2	2	1	2	3	20
CO4	2	3	-	-	1	2	2	-	2	2	1	2	2	19
CO5	2	2	-	-	2	1	2	-	2	2	-	2	3	18
<b>Grand total of COs with PSOs and POs</b>														<b>99</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(99/49)</b>														<b>2.05</b>

**Strong – 3, Medium -2, Low – 1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.05
Observation	COs of Ethical Hacking – Medium related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**CBCS and OBE Pattern**

(Those who join from 2023-24 onwards)

<b>SEMESTER – I</b>				
<b>Part</b>	<b>Subject Code</b>	<b>Title of the paper</b>	<b>Hours</b>	<b>Credits</b>
I	22UTAL11/ 22UHNL11/ 22USNL11	Tamil/ Hindi/French	06	04
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream- A English through Prose & Short Story – Stream- B	05	04
III	22UCSC11	<b>Core: 1 Programming in C</b>	05	04
	22UCSC21	<b>Core: 2 PC Hardware and Troubleshooting</b>	04	03
	22UCSP11	<b>Core Lab: 1 Programming in C–Practical</b>	05	03
	22UCSA11	<b>Allied: 1 Digital Computer Fundamentals</b>	03	03
IV	22UFCE11	FC – Personality Development	1	1
	22UCSH12	Communication Skill	1	-
	22UBRC11	Bridge Course	-	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NCC/NSS/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	---	---
<b>Total</b>			<b>30</b>	<b>23</b>
<b>SEMESTER – II</b>				
I	22UTAL22/ 22UHNL22/ 22USNL22	Tamil/ Hindi/ French	06	04
II	22UENA22/ 22UENB22	English through Prose & Poetry – Stream – A English through Prose & Poetry – Stream – B	05	04
III	22UCSC32	<b>Core: 3 Object Oriented Programming with C++</b>	05	04
	22UCSC42	<b>Core: 4 Web Designing</b>	04	03
	22UCSP22	<b>Core Lab: 2 Object Oriented Programming with C++ - Practical</b>	05	03
	22UCSA22	<b>Allied: 2 Discrete Mathematics</b>	03	03
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skill	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NSS/NCC/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	-	1
<b>Total</b>			<b>30</b>	<b>24</b>

<b>SEMESTER – III</b>				
	22UTAL33/ 22UHNL33/ 22USNL33	<b>Tamil</b>	06	04
	22UCSC53	<b>Core: 5 Programming in JAVA</b>	04	04
	22UCSC63	<b>Core: 6 Data Structures and Algorithms</b>	04	03
	22UCSP33	<b>Core Lab: 3 Programming in JAVA–Lab</b>	05	03
	22UCSA33	<b>Allied: 3 Computer Organization and Architecture</b>	04	03
	22UCSN13	<b>NME: 1 Web Designing (For Arts students)</b>	03	02
	22UCSS13	<b>SBE: 1 Quantitative Aptitude and Reasoning</b>	03	02
	22UFCE33	FC – Environmental Studies	01	01
	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB24	Extension Activities NCC/NSS/Phy.Edn./ YRC/ROTARACT/AICUF/Nature Club	-	-
	22UARE14	ARISE		
		<b>Total</b>	<b>30</b>	<b>22</b>
<b>SEMESTER – IV</b>				
	22UTAL33/ 22UHNL33/ 22USNL33	<b>Tamil</b>	06	04
	22UCSC74	<b>Core: 7 Web Programming</b>	05	04
	22UCSC84	<b>Core: 8 Operating System</b>	04	04
	22UCSP44	<b>Core Lab: 4 Web Programming – Lab</b>	05	03
III	22UCSA44	<b>Allied: 4 Operation Research</b>	03	03
	22UCSN24	NME: 2 Web Designing (For Science Students)	03	02
IV	22UCSN24	SBE: 2 Open Source Technology	03	02
	22UFCH44	FC – Religious Literacy and Peace Ethics	01	01
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB24	Extension Activities NCC/NSS/Phy.Edn./ YRC/ROTARACT/AICUF/Nature Club	-	01
	22UARE14	ARISE	-	01
		<b>Total</b>	<b>30</b>	<b>25</b>
<b>SEMESTER – V</b>				
III	22UCSC95	<b>Core: 9 Big Data Analytics using R</b>	05	05
	22UCSD05	<b>Core: 10 Mobile Computing</b>	05	05
	22UCSD15	<b>Core: 11 Dot NET Programming</b>	05	05
	22UCSD25	<b>Core: 12 Network Security and Cryptography</b>	05	04

	22UCSP55	<b>Core Lab: 5 Dot NET Programming – Lab</b>	05	03
	22UCSE15	<b>Core Elective:1</b> <b>1. Introduction to Data Science</b> <b>2. Artificial Neural Networks</b> <b>3. Linux Shell Programming</b>	03	03
IV	22USSI16	Soft Skills	02	-
		<b>Total</b>	<b>30</b>	<b>25</b>
<b>SEMESTER – VI</b>				
III	22UCSD36	<b>Core: 13 Software Engineering</b>	05	04
	22UCSD46	<b>Core: 14 Data Mining and Ware Housing</b>	04	04
	22UCSD56	<b>Core: 15 Mobile Application Development</b>	05	04
	22UCSD66	<b>Core: 16 Python Programming</b>	05	03
	22UCSD76	<b>Core: 17 Major Project</b>	01	02
	22UCSP66	<b>Core Lab: Python Programming – Lab</b>	05	03
	22UCSE26	<b>Core Elective: 2</b> <b>1. Internet of Things (IoT)</b> <b>2. Artificial Intelligence</b> <b>3. Software Testing</b>	03	03
IV	22USSI16	Soft Skills	02	02
		<b>Total</b>	<b>30</b>	<b>25</b>

#### Credits for each Semester

Semester	I	II	III	IV	V	VI	Total
<b>Credits</b>	23	24	22	25	25	25	<b>144</b>

#### Self-Learning Courses

S.No	Semester	Sub. Code	Title of the Paper	Credits
1.	III	22UCSSL3	Software Project Management	3
2.	IV	22UCSSL4	Cloud Computing	3
3.	V	22UCSSL5	System Administration and Maintenance	3
4.	VI	22UCSSL6	Ethical Hacking	3

**225903**  
**ARUL ANANDAR COLLEGE (AUTONOMOUS)**  
**DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS**  
**M.Sc. Computer Science (2 Years)**  
**CBCS & OBE PATTERN (From 2023 onwards)**

Nature of the paper	Sub.Code	Title	Hr	Cr
<b>FIRST YEAR – FIRST SEMESTER</b>				
<b>Core</b>	24PCSC11	<b>Core – 1</b> : Data Structures and Algorithms	05	05
	24PCSC21	<b>Core – 2</b> : Advanced Java Programming	05	05
	24PCSC31	<b>Core – 3</b> : Distributed Operating System	05	04
<b>Core Elective</b>	24PCSE11	<b>Core Elective – 1:</b> Advanced Computer Networks / Computer Graphics and Multimedia Systems	05	04
<b>Core Practical</b>	24PCSP11	<b>Core Lab – 1:</b> Data Structures Algorithms – Lab	05	03
	24PCSP21	<b>Core Lab – 2:</b> Advanced Java Programming Lab	05	03
<b>Total</b>			<b>30</b>	<b>24</b>
<b>FIRST YEAR – SECOND SEMESTER</b>				
<b>Core</b>	24PCSC42	<b>Core – 4:</b> Python Programming	05	05
	24PCSC52	<b>Core – 5:</b> Advanced Web Technologies	05	04
<b>Core Elective</b>	24PCSE22	<b>Core Elective – 2:</b> Cryptography and Network Security / Mobile Computing	04	04
<b>Core Practical</b>	24PCSP32	<b>Core Lab – 3:</b> Advanced Web Technology Lab	05	03
	24PCSP42	<b>Core Lab – 4 :</b> Python Programming Lab	05	03
<b>Non Major Elective</b>	24PCSN12	<b>NME</b> Software License Management	04	04
	24PLFS12	<b>Life Skills</b>	2+2*	02
<b>Total</b>			<b>30</b>	<b>25</b>

<b>SECOND YEAR – THIRD SEMESTER</b>				
<b>Core</b>	24PCSC63	<b>Core – 6:</b> Internet of Things	05	04
	24PCSC73	<b>Core – 7:</b> R programming	05	04
	24PCSC83	<b>Core –8:</b> Machine Learning	05	04
<b>Core Elective</b>	24PCSE33	<b>Core Elective – 3:</b> Cloud Computing / Open Source Technologies	05	04
<b>Core Practicals</b>	24PCSP53	<b>Core Lab – 5:</b> R Programming Lab	05	04
	24PCSP63	<b>Core Lab – 6:</b> Machine Learning Lab	05	04
<b>Total</b>			<b>30</b>	<b>24</b>
<b>SECOND YEAR – FOURTH SEMESTER</b>				
<b>Core Electives (Online mode)</b>	24PCSE44	<b>Core Elective – 4:</b> Software Project Management / Artificial Intelligence	05	05
	24PCSE54	<b>Core Elective – 5:</b> Data Science / Big Data Analytics	05	05
		Project	20	09
<b>Total</b>			<b>30</b>	<b>19</b>

<b>Semester Credits</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>Total</b>
	24	25	24	19	92

#### **Self-Learning Courses 2**

The students can undertake any online courses offered by SWAYAM during any of the semesters and can earn extra credit.

<b>Credit</b>	<b>2 per course</b>
<b>Maximum</b>	<b>4 credits</b>

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR  
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: M.Sc., Computer Science</b>	<b>Part : Core – 1</b>
<b>Semester</b>	<b>: I</b>	<b>Hours : 75</b>
<b>Subject Code</b>	<b>: 24PCSC11</b>	<b>Credit : 5</b>

**DATA STRUCTURES AND ALGORITHMS**

**Objectives:**

The course enables the students to

- Understand and remember algorithms and its analysis procedure.
- Understand the concepts of data structures through ADT including Stack & Queues
- Familiar with implementation of dynamic data structures
- Familiar with internal and external sorting algorithms and its complexities
- Apply the concepts of advanced data structure such as binary tree, Hash table & Symbol table.

**UNIT I**

**15 Hours**

Abstract Data Types – Algorithm – Algorithm Analysis – Goal of Analysis of Algorithm –Running Time Analysis – How to compare Algorithms – Types of Analysis – Recursion and Back Tracking.

**UNIT II**

**15 Hours**

Stacks and Queues - Fundamentals- Stack and Queue ADT-Operations- Exceptions- Applications.

**UNIT III**

**15 Hours**

Linked Lists- Linked List ADT – Why Linked List – Comparison of linked list with Arrays – singly linked list – Doubly linked list –Circular linked list –A Memory efficient Doubly Linked list –Unrolled Linked List.

**UNIT IV**

**15 Hours**

**Searching and Sorting:** Types of Searching – Linear search types – Binary Search – Interpolation search – Sorting – Classification of sorting – Bubble sort- Insertion sort – Selection sort – shell sort –merge sort – heap sort –quick sort – Radix sort – Topological sort – External sorting.

**UNIT V**

**15 Hours**

**Tree** – Binary Tree – Binary tree traversal – Generic trees (N-ary trees) – Threaded Binary tree – Expression tree – Binary search tree - AVL tree – symbol table –Hashing – Hash Functions – Hash tables – Collisions – Collision resolution techniques.

**Book for Study**

1. Karumanchi Narasimha, *Data Structures and Algorithms Made Easy by JAVA*, Second Edition, Careermonk Publications.

**Books for Reference**

1. Weiss Allen Mark, *Data Structures and Algorithms in C*, 1997, Addison-Wesley.

2. Horowitz Ellitz, Sahni Sartaj, *Data Structures*, Second Edition, Universities Press.

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### Course Outcomes:

On Successful completion of the course the students able to

**CO1:** Analyze the algorithm to be applied for specific problem (K4)

**CO2:** Understand the functions of linear data structures. (K3)

**CO3:** Understand the advanced linear data structure (K2)

**CO4:** Implement appropriate sorting/searching technique for given problem. (K3)

**CO5:** Understand the functions of compiler/interpreter (K2)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course Outcome with POs and PSOs

Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of Cos with PSOs& POs
CO1	3	3	2	1	1	3	-	-	3	3	-	3	3	25
CO2	3	3	2	1	2	3	-	-	3	3	-	3	3	26
CO3	3	3	3	1	2	3	-	-	3	3	-	3	3	27
CO4	3	3	3	2	2	3	-	-	3	3	-	3	3	28
CO5	3	3	3	2	2	3	-	-	3	3	-	3	3	28
<b>Grand total of COs with PSOs and POs</b>														<b>134</b>
<b>Grand total with PSOs and POs</b>														
<b>Mean value of COs with PSOs and POs = <math>\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \&amp; POs}} = (134 / 50)</math></b>														<b>2.68</b>

Strong – 3, Medium -2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and Pos			2.68
Observation	COs of Data Structures and Algorithms – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR  
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class** : M.Sc., Computer Science **Part** : Core – 2  
**Semester** : I **Hours** : 75  
**Subject Code** : 24PCSC21 **Credit** : 5

**ADVANCED JAVA PROGRAMMING**

**Objectives:**

The course enables the students to

- Understand the Classes and methods, utility classes, multithreading
- Understand advanced concepts of generics, collection interface and mapping
- Apply JFC to develop we applications using controls
- Apply servlet to create server side scripting applications
- Understand and develop Transaction applications

**Unit I** **(15 Hours)**

Introduction -Genesis of Java- Types of Java applications – Data types, variables and arrays – Operators – Utility Classes – String Handling- Control statements – Classes and Methods – Inheritance – Packages and Interfaces –Exception Handling- Multithreaded Programming.

**Unit II** **(15 Hours)**

Introduction about generics - boxing and unboxing - for each generics methods and variable arguments- sub typing and wildcards - data declaration – collection interfaces - sets – queue - lists- maps.

**UNIT III** **(15 Hours)**

Java Foundation classes(JFC) /Swings –JButtons, JLabels, JCheck boxes, JRadio Buttons, JChoices, Lists, JText Fields and JText areas – JScrollbars – Canvases – Event Delegation model – Exceptions – Event classes – Listener Interfaces – Containers and Layout Managers– Adding tool tips and icons – Popup menus – Tabbed panes – sliders –progress bars – Tables.

**UNIT IV** **(15 Hours)**

Servlet basics-the servlet life cycle- retrieving information- sending HTML information- the session tracking- database connectivity. **JSP:** Introducing Java server pages – basics- beneath JSP -JSP session - JSP architecture – security.

**UNIT V** **(15 Hours)**

EJB architecture- EJB requirements – design and implementation – EJB session beans- EJB entity beans-EJB Clients – deployment tips, tricks and traps for building distributed and other systems – implementation and future directions of EJB-Variable in perl- perl control structures and operators – functions and scope

**Books for Study**

1. J. McGovern,R. Adatia,Y. Fain, *J2EE 1.4 Bible*, Wiley- Dream Tech India Pvt. Ltd, New Delhi, 2003
2. H. Schildt, *Java 2 Complete Reference*, Fifth Edition, Tata McGraw-Hill, New Delhi, 2017

**Books for Reference**

1. Sierra Kathy, *Head First Java*, Second Edition, O'Reilly Media, 2009
2. Holzner Steve, Holzner Steven, *Java 2 Black Book*, Second Edition, Paraglyph Press, 2005

**Teaching Methods**

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

**Course Outcomes**

On successful completion of the course the students will be able to

CO1: Understand the classes and object, multithreading and interface of java (K2)

CO2: Understand the generic of java for the advanced programming (K2)

CO3: Create GUI form using swing concepts (K6)

CO4: Develop server applications using servlet & JDBC (K6)

CO5: Design and develop EJB for transaction in business services (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	3	1	2	3	-	-	3	3	-	3	3	26
CO2	3	2	3	1	2	2	-	-	3	3	-	3	2	24
CO3	3	2	3	1	2	3	-	-	3	3	-	2	3	25
CO4	3	1	2	1	2	3	-	-	3	3	-	3	3	24
CO5	3	1	2	1	1	3	-	-	3	3	-	3	3	23
<b>Grand total of COs with PSOs and POs</b>														<b>122</b>
<b>Mean Value of COs with PSOs and POs=122/50</b> (MV= Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs)														<b>2.44</b>

**Strong -3, Medium -2, Low -1**

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.44
Observation	COs of Advanced Java Programming – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : M.Sc., Computer Science**

**Part : Core – 3**

**Semester : I**

**Hours : 75**

**Subject Code : 24PCSC31**

**Credit : 4**

**DISTRIBUTED OPERATING SYSTEMS**

**Objectives:**

The course enables the students to

- explore concepts of operating system components and layers
- understand inter-process communication and distributed dead lock detection algorithms
- Analyze the techniques and methods of distributed resource management
- understand J2EE architecture and APIs for database programming
- understand JEE containers and secured orchestration of containers in the Cloud

**Unit I**

**(15 Hours)**

Introduction – Operating System Definition – Functions of Operating System – Types of Advanced Operating System – Design Approaches – Synchronization Mechanisms – concepts of a Process – Critical Section Problem – Process Deadlock – Models of Deadlock – Conditions for Deadlock – System with single-unit requests, Consumable Resources, Reusable Resources

**Unit II**

**(15 Hours)**

Issues – Communication Primitives – Inherent Limitations –Lamport’s Logical Clock , Vector Clock, Global State , Cuts – Termination Detection – Distributed Mutual Exclusion – Non Token Based Algorithms – Lamport’s Algorithm - Token Based Algorithms –Distributed Deadlock Detection – Distributed Deadlock Detection Algorithms – Agreement Protocols

**Unit III**

**(15 Hours)**

Distributed Resource Management – Distributed File Systems – Architecture – Mechanisms – Design Issues – Distributed shared Memory – Architecture – Algorithm – Protocols – Design Issues – Distributed Scheduling – Issues – Components – Algorithms

**Unit IV**

**(15 Hours)**

Failure Recovery and Fault Tolerance – Concepts – Failure Classifications – Approaches to Recovery – Recovery in Concurrent Systems – Synchronous and Asynchronous Check pointing and Recovery – Check pointing in Distributed Database Systems – Fault Tolerance Issues – Two-Phase and Nonblocking Commit Protocols – Voting Protocols – Dynamic Voting Protocols

## Unit V

(15 Hours)

Multiprocessor and Database Operating Systems –Structures – Design Issues – Threads – Process Synchronization – Processor Scheduling – Memory management – Reliability/Fault Tolerance – Database Operating Systems – concepts – Features of Android OS, Ubuntu, Google Chrome OS and Linux operating systems

### Text Books

1. MukeshSinghalN.G.Shivaratri, “Advanced Concepts in Operating Systems”, McGraw Hill 2000.
2. Distributed Operating System – Andrew S. Tanenbaum, PHI.

### Reference Books

1. Abraham Silberschatz, Peter B.Galvin, G.Gagne, “Operating Concepts”, 6<sup>th</sup> Edition Addison Wesley publications 2003.
2. Andrew S.Tanenbaum, “Modern Operating Systems”, 2<sup>nd</sup> Edition Addison Wesley 2001

### Web References

1. <https://www.udemy.com>
2. <https://www.edureka.co>
3. <https://archive.nptel.ac.in>

### Teaching Methods

- Lecturing
- PPTs
- Group Discussion
- Learning by Assignments
- Video tutorials

### Course Outcomes

On successful completion of the course the students will be able to

CO1: list and employ services and functionalities of operating systems (K4)

CO2: identify distributed resources and resource management (K2)

CO3: understand distributed dead lock prevention and avoidance algorithms (K4)

CO4: explore issues and challenges in the design of distributed operating systems (K6)

CO5: explore modern file systems and portable operating systems (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	2	1	1	2	-	-	3	1	-	2	2	19
CO2	3	3	2	1	1	2	-	-	3	1	-	2	2	20
CO3	3	3	3	2	1	2	-	-	3	1	-	2	2	31
CO4	3	3	2	2	1	2	-	-	3	1	-	2	2	21
CO5	3	2	2	1	1	2	-	-	3	1	-	2	2	19
Grand total of COs with PSOs and POs														110
Grand total with PSOs and POs														2.2
<p style="text-align: center;">Mean value of COs with PSO and POs = <math>(110/50)</math>                      Number of COs relating with PSOs&amp; POs</p>														

Strong – 3, Medium -2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.2
Observation	COs of Distributed Operating System – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: M.Sc., Computer Science</b>	<b>Part : Core Elective – 1</b>
<b>Semester</b>	<b>: I</b>	<b>Hours : 75</b>
<b>Subject Code</b>	<b>: 24PCSE11 (A)</b>	<b>Credit : 4</b>

**ADVANCED COMPUTER NETWORKS**

**Objectives:**

The course enables the students to

- Understand how computer networks are organized with the concept of layered approach.
- Understand various types of Transmission Media.
- Understand the mechanism for error detection and correction methods.
- Understand the routing algorithms and its execution process.
- Understand the functions of Application Layer Protocols and its uses.

**Unit I** **(15 Hours)**

Introduction – Network Hardware – Software – Reference Models – OSI and TCP/IP models – Example networks: Internet, 3G Mobile phone networks, Wireless LANs –RFID and sensor networks - Physical layer – Theoretical basis for data communication - guided transmission media

**Unit II** **(15 Hours)**

Wireless transmission - Communication Satellites – Digital modulation and multiplexing - Telephones network structure – local loop, trunks and multiplexing, switching. Data link layer: Design issues – error detection and correction

**Unit III** **(15 Hours)**

Elementary data link protocols - sliding window protocols – Example Data Link protocols – Packet over SONET, ADSL - Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols

**Unit IV** **(15 Hours)**

Network layer - design issues - Routing algorithms - Congestion control algorithms – Quality of Service – Network layer of Internet- IP protocol – IP Address – Internet Control Protocol

**Unit V** **(15 Hours)**

Transport layer – transport service- Elements of transport protocol - Addressing, Establishing & Releasing a connection – Error control, flow control, multiplexing and crash recovery - Internet Transport Protocol – TCP - Network Security: Cryptography

**Text Book**

1. S. Tanenbaum, Computer Networks, 5<sup>th</sup> Edition, Tata McGraw Hill, 2011

**Reference Books**

1. B. Forouzan, Introduction to Data Communications in Networking, TMH, 2012.

2. F. Halsall, Data Communications, Computer Networks and Open Systems, Addison Wessley.
3. D. Bertsekas and R. Gallager, Data Networks, Prentice hall of India, 1992.
4. Lamarca, Communication Networks, Tata McGraw Hill, New Delhi,2002.

**E-learning resources**

1. <https://peasonhighered.com/tanenbaum>

**Teaching Methods**

- Lecturing
- PPTs
- Group Discussion
- Learning by Assignments
- Video tutorials

**Course Outcomes**

On successful completion of the course the students will be able to

- CO1: Understand the basic concepts of computer networks and its architecture. (K2)
- CO2: Analyze various transmission mediums by comparing its properties. (K4)
- CO3: Understand the contents in a given data packet, based on the layer concept (K2)
- CO4: Implement suitable routing and congestion control algorithms. (K3)
- CO5: Understand the various Application Layer Protocols. (K2)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of Cos with PSOs & POs
CO1	2	2	1	1	1	3	-	-	3	2	-	2	3	23
CO2	2	2	2	1	-	3	-	-	3	1	-	3	2	22
CO3	3	2	2	2	1	3	-	-	3	2	-	2	3	27
CO4	2	2	2	1	-	3	-	-	3	2	-	2	3	22
CO5	2	2	2	1	1	2	-	-	3	2	-	2	2	23
<b>Grand total of Cos with PSOs and Pos</b>														<b>117</b>
<b>Grand total with PSOs and POs</b>														
Mean value of Cos with PSO and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (117/59)														<b>1.98</b>

Strong – 3, Medium -2, Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.98	
Observation	COs of Advanced Computer Network – Medium related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR  
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: M.Sc (CS)</b>	<b>Part : Core Elective -I</b>
<b>Semester</b>	<b>: I</b>	<b>Hours : 75</b>
<b>Subject Code</b>	<b>: 24PCSE11 (B)</b>	<b>Credit : 4</b>

**COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS**

**Objectives:**

The course enables the students to

- Understand the graphics system and output primitive algorithms
- Apply 2D transformation techniques and clipping operations
- Understand the 3D concepts and color models
- Apply multimedia concepts in flash software
- Understand the timeline effects, multimedia database systems

**Unit: I INTRODUCTION (15 Hours)**

Overview of Graphics System – Working principles of CRT- Random scan Method - Raster Scan Method - Line Drawing and Circle Drawing Algorithms - DDA – Bresenham’s technique.

**Unit: II 2D TRANSFORMATION (15 Hours)**

Two dimensional transformations –translation-Scaling and Rotations –Composite transformation-Interactive Input methods- Polygons - Splines - Bezier Curves - Window to view port mapping transformations-Clipping Operations.

**UNIT: III 3D TRANSFORMATION (15 Hours)**

3D Concepts : 3D transformations -3D composite transformation -Projections - Parallel Projection - Perspective Projection - Visualization and polygon rendering - Color models - XYZ-RGB-YIQ-CMY-HSV Models . Animation - Key Frame systems - General animation functions - morphing.

**UNIT IV: OVERVIEW OF MULTIMEDIA (15 Hours)**

Multimedia hardware & software - Components of multimedia - Text, Image - Graphics - Audio - Video - Animation - Authoring. **Flash:** Overview of Flash- Introduction to the flash interface- Setting stage dimensions, working with panels, panel layouts- Introduction to drawing and tools in Flash- Layers –Key Frames-Motion Tween.

**UNIT V: MULTIMEDIA SYSTEMS AND APPLICATIONS (15 Hours)**

Animation – Working with timeline effects – Using the frame by-frame animation technique- Animating with movie clips - multimedia communication systems - Data base systems - Synchronization Issues - Presentation requirements - Applications - Video conferencing - Virtual reality - Interactive video - video on demand.

**BOOKS FOR STUDY**

1. Hearn D , Baker M.P, *Computer Graphics - C Version*, Second Edition, Pearson Education, 2004
2. Steinmetz Ralf, SteinmetzKlara, *Multimedia Computing, Communications and Applications*, Pearson Education, 2004

**BOOKS FOR REFERENCE**

1. Angel, E., *Interactive Computer Graphics: A Top-Down Approach with OpenGL*, Fourth Edition, Addison Wesley, 2005
2. Rebenschied Shane, *Macromedia Flash MX*, First Edition, Peachpit Press, 2004

**Teaching Methods**

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

**Course Outcomes**

On successful completion of the course students will be able to

- CO1:** Apply the output primitive algorithms to create application for drawing shapes. (K3)  
**CO2:** Apply the techniques of 2D operations and clipping to develop image synthesis applications. (K3)  
**CO3:** Understand the 3D projections and RGB,CMY color models.(K2)  
**CO4:** Create video using flash software.(K6)  
**CO5:** Understand frame by frame animation, non-linear movie and multimedia communication system.(K2)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	2	2	3	1	2	2	-	-	3	1	-	3	3	22
CO2	1	2	3	1	2	2	-	-	3	1	-	3	2	20
CO3	3	2	3	1	2	3	-	-	3	1	-	2	3	23
CO4	1	1	2	1	2	3	-	-	3	1	-	3	3	20
CO5	1	1	2	1	2	3	-	-	3	1	-	3	3	20
<b>Grand total of COs with PSOs and POs</b>														<b>105</b>
<b>Grand total with PSOs and POs</b>														<b>2.10</b>
<b>Mean value of COs with PSOs and POs = <math>\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\&amp; POs}} = (105 / 50)</math></b>														

**Strong -3 , Medium -2 , Low -1**

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.10
Observation	COs of Computer Graphics and Multimedia Systems– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : M.Sc., Computer Science**

**Part : Core Lab - 1**

**Semester : I**

**Hours : 75**

**Subject Code : 24PCSP11**

**Credit : 3**

**DATA STRUCTURES AND ALGORITHMS LAB**

**Objectives:**

The course enables the students to

- Develop skills in design and implementation of data structures and their applications.
- Learn and implement Linear, non Linear and Tree data structures
- Learn ADT and Graph data structures and its applications.
- Study and analyze different sorting techniques.
- Design the applications for Searching techniques.

**LIST OF EXPERIMENTS**

1. Write a program to check whether the number provided is even or odd.
2. Write a program to print the largest number among three numbers given by the user.
3. Write a C++ program to print table of a number using do while loop.
4. Write a program that take a string as input and print it.
5. Write a program define a class to represent a bank account profile
6. Write a C+ + program to create a person class and find the total, average and grade of each student and count the grade of I, II, & III, display the report
7. Write a program to demonstrate the use of class and object.
8. Write a program to demonstrate the use of constructor and destructor in a class.
9. Write a program to demonstrate the use of static variable and static function.
10. Write a program to get and print student data using inheritance.
11. Write a program to overload a sum function.
12. Write a program to create a virtual function demonstration using run Time binding.
13. a)Write a program for static binding (accessing member function using pointers)  
b)Write a program for dynamic binding (accessing member function using pointers)
14. Write a program for pure virtual function.
15. Write program to display Sum and Average of Array Elements Using for Loop
16. Write a Program to implement Stack using Array.
17. Write a program to implement stack using linked list.
18. Write a program to implement queue using linked list.
19. Write a program for binary tree insertion and in-order traversal
20. Write a program to search a given value in an array using sequential search.
21. Write a program to search an element in the array using binary search.
22. Write a program to sort an array using selection sort.
23. Write a C++ program to sort an array using insertion sort.
24. Write a C++ program to sort an array using quick sort.

25. Write a program to implement merge sort.

**Course Outcomes**

On successful completion of the course students will be able to

**CO1:** Apply with basic data structures that are suitable for the problems to be solved efficiently.(K3)

**CO2:** Design and implement linear, and tree and its applications. (K3)

**CO3:** Work with ADT with its applications. (K3)

**CO4:** Design sorting technique, its algorithm design and analysis. (K3)

**CO5:** Implement the problem in the Searching techniques. (K3)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	3	2	1	3	-	-	3	3	-	3	3	27
CO2	3	3	3	2	1	3	-	-	3	3	-	3	3	27
CO3	3	3	3	2	1	3	-	-	3	3	-	3	3	27
CO4	3	3	3	2	1	3	-	-	3	3	-	3	3	27
CO5	3	3	3	2	1	3	-	-	3	3	-	3	3	27
<b>Grand total of COs with PSOs and POs</b>														<b>135</b>
<b>Grand total with PSOs and POs</b>														
<b>Mean value of COs with PSOs and POs = <math>\frac{135}{50}</math> = (135/50)</b>														<b>2.70</b>
<b>Number of COs relating with PSOs &amp; POs</b>														

Strong – 3, Medium -2, Low - 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.70
Observation	COs Data Structures and algorithms- Lab– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: M.Sc., Computer Science</b>	<b>Part : Core Lab - 2</b>
<b>Semester</b>	<b>: I</b>	<b>Hours : 75</b>
<b>Subject Code</b>	<b>: 24PCSP21</b>	<b>Credit : 3</b>

**ADVANCED JAVA PROGRAMMING LAB**

**Objectives:**

The course enables the students to

- Apply CMS Concepts to create blog or websites.
- Apply JSP to develop web applications
- Apply and design servlet applications
- Develop programs using JDBC technique
- Develop programs using generic classes

**JSP**

1. Display Employee Table
2. Display Department Faculty Details
3. Exam Result
4. Course Registration System
5. Alumni Website
6. Display College Course List
7. News and Events Block using DB
8. User Registration Page using Session
9. User Login Page using Session

**SERVLET**

1. HTTP Servlet Communication
2. Generic Servlet Communication
3. User Registration and Login Process using session

**EJB with JDBC**

4. Display Employee Table using JDBC
5. Insert a Record in Employee Table using JDBC
6. Servlet Chaining
7. Bean Validation
8. Session and Cookie Management

**Teaching Methods**

- Lecturing
- PPTs
- Learning by Doing
- Demonstrate method

## Course Outcomes

On successful completion of course the students will be able to

CO1: Develop blog or websites using content management systems.

CO2: Design and develop their own web applications by JSP concepts (K6)

CO3: Develop server side programming by servlet and session management (K6)

CO4: Develop applications using JDBC concepts (K6)

CO5: Apply generic classes in advanced java applications (K3)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course outcome with POs and PSOs

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO2	2	2	2	1	1	3	3	-	-	2	2	2	-	20
CO3	3	2	2	2	2	3	3	-	-	2	2	2	-	23
CO4	3	3	2	2	2	3	3	-	-	2	2	2	-	24
CO5	3	2	2	2	2	3	3	-	-	2	2	2	-	23
Grand Total of COs with POs PSOs														110
<b>Grand total with PSOs and POs</b> <b>Mean value of COs with PSOs and POs = <math>\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \&amp; POs}} = (110/50)</math></b>														<b>2.20</b>

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.20
Observation	COs of Advanced Java Programming – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: M.Sc., Computer Science</b>	<b>Part : Core -4</b>
<b>Semester</b>	<b>: II</b>	<b>Hours : 75</b>
<b>Subject Code</b>	<b>: 24PCSC42</b>	<b>Credit : 5</b>

**PYTHON PROGRAMMING**

**Objectives:**

The course enables the students to

- Understand the basic features of Python
- Develop Python programs with conditionals and loops and data structures
- Build composite data types in Python
- Design and write efficient application using OOPs concepts
- Design and program Python applications with database.

**UNIT- I: INTRODUCTION TO PYTHON (15 HOURS)**

Overview – History of Python – Python features – Data types-Arithmetic Operators-Expressions - Comments in the Program-Understanding the error Messages Python interpreter and interactive mode-values and types- variables, expressions, statements, precedence of operators

**UNIT II: CONTROL FLOW (15 HOURS)**

Conditionals: Boolean values and operators- conditional - Iteration: functions: return values- parameters- local and global scope- function composition- recursion; arrays-Traversal with a for Loop- String Slices- Strings Are Immutable- Searching- Looping and Counting- String Methods- The in Operator- String Comparison- String Operations

**UNIT- III: COLLECTION DATA TYPESLES (15 HOURS)**

Lists: list operations- list slices- list methods- list loop- mutability- aliasing- cloning lists- list parameters; Tuples: tuple assignment- tuple as return value; Dictionaries: operations and methods; advanced list processing – list comprehension - Files - errors and exceptions- handling exceptions

**UNIT IV: OBJECT ORIENTATION (15 HOURS)**

Regular Expressions – Concept of regular expression- various types of regular expressions- using match function. Classes and Objects: Overview of OOP (Object Oriented Programming)- Class Definition- Creating Objects- Instances as Arguments- Instances as return values- Built-in Class Attributes- Inheritance- Method Overriding- Data Encapsulation- Data Hiding

**UNIT V: GUI PROGRAMMING (15 HOURS)**

Widgets: Button, Canvas, Checkbutton, Entry, Frame, Label, Listbox, Menubutton, Menu, Message, Radiobutton, Scale, Scrollbar, text, Toplevel, Spinbox, PanedWindow, LabelFrame, Messagebox. Handling Standard attributes and Properties of Widgets - Connecting to a MySQL database from Python

**Books for Study**

1. Downey Allen. B, *Think Python: How to Think Like a Computer Scientist*, Second Edition, O'Reilly Publishers, 2016,
2. Rossum VanGuido, Jr Drake Fred. L, *An Introduction to Python Revised and updated for Python 3.2*, Network Theory Ltd., 2011.

- Goldwasser Michael. Letscher H, David, *Object-oriented Programming in Python*, Pearson Prentice Hall, 2008

**Books for Reference**

- Dierbach Charles, *Introduction to Computer Science using Python: A Computational Problem- Solving Focus*, Wiley India Edition, 2013
- Gutttag John. V, *Introduction to Computation and Programming Using Python*, Revised and expanded Edition, MIT Press, 2013
- Budd Timothy A, *Exploring Python*, Mc-Graw Hill Education (India) Private Ltd, 2015

**COURSE OUTCOMES**

On the successful completion of the course the students will able to

**CO1:** Develop simple Python programs for solving problems.(K3)

**CO2:** Write simple Python programs and decompose a Python program into functions.(K2)

**CO3:** Understand complex data types and files in Python Programs. (K3)

**CO4:** Develop programming using OOPs concepts in python. (K3)

**CO5:** Create the GUI Form and Adding Widgets and design GUI database. (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	2	3	2	2	-	-	3	3	-	3	3	27
CO2	3	2	2	2	2	3	-	-	3	2	-	3	3	25
CO3	3	2	3	3	2	3	-	-	3	2	-	3	3	27
CO4	3	2	3	3	2	3	-	-	3	2	-	3	3	27
CO5	3	2	3	3	2	3	-	-	3	2	-	3	3	27
<b>Grand total of COs with PSOs and POs</b>														<b>133</b>
<b>Grand total with PSOs and POs</b>														
<b>Mean value of COs with PSO and POs =</b>												<b>(133/50)</b>	<b>2.66</b>	
<b>Number of COs relating with PSOs&amp; POs</b>														

**Strong – 3, Medium -2, Low – 1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.66
Observation	COs of Python Programming– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: M.Sc., Computer Science</b>	<b>Part : Core – 5</b>
<b>Semester</b>	<b>: II</b>	<b>Hours : 75</b>
<b>Subject Code</b>	<b>: 24PCSC52</b>	<b>Credit : 4</b>

**ADVANCED WEB TECHNOLOGIES**

**Objectives:**

**The course enables the students to**

- Understand the basics of internet and web programming
- Understand and analyze the concept of Dynamic and interactive web application design
- Explore the idea of XML code and data management
- Explore programming constructs of Javascript and interface design
- Explore PHP code constructs and database programming with MySQL

**Unit I: Web Basics and HTML**

**(15 Hours)**

Introduction, Concept of Internet- History of Internet, Protocols of Internet, World Wide Web, URL, Web Server, Web Browser. Introduction, History of HTML, Structure of HTML Document: Text Basics, Structure of HTML Document: Images and Multimedia, Links and webs, Document Layout, Cascading Style Sheet-HTML 4 style sheet features, Creating Forms, Frames and Tables.

**Unit II: Dynamic HTML**

**(15 Hours)**

Introduction of DHTML- HTML vs. DHTML, Advantages of DHTML, CSS of DHTML, Event Handling, Data Binding, Browser Object Models.

**Unit III: XML**

**(15 Hours)**

Introduction of XML- Some current applications of XML, Features of XML, Anatomy of XML document, The XML Declaration, Element Tags- Nesting and structure, XML text and text formatting element, Table element, Mark-up Element and Attributes, DTD - types.

**Unit IV: Javascript**

**(15 Hours)**

JAVA SCRIPT – Introduction – Usage of variables – operations – control structures – looping structures – predefined keywords – arrays – predefined functions – user defined functions – arrays and functions – mathematical functions – string functions –Exception Handling – Built-in objects –Date Object – Events and Event Handling – Window – Confirmation, alert message.

**Unit V: PHP and MySQL**

**(15 Hours)**

Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, string, Form processing, Files, Advance Features: Cookies and Sessions, Object Oriented Programming with PHP – Database Programming – Implementing SQL statements using PHP

**Books for Study**

1. *HTML5 Black Book: Covers CSS3, JavaScript, XML, XHTML, Ajax, PHP and JQuery*, Kogent Learning Solutions 2016.

### Books for Reference

1. McCoy, *Mastering Web Design*, Third Edition, BPB Publications, New Delhi.
2. Weiss Aaron, *The Complete Idiot's guide to JavaScript*, Second Edition, PHI.
3. Ecky Putrady, —Practical Web Development with Haskell: Master the essential skills to build fast and scalable web applications||, 1st edition , Apress, 2018
4. Peter Moulding, *PHP Black Book*, Dreamtech Press Ltd, 2001

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### Course Outcomes

On the successful completion of this course students will be able to

**CO1:** Review internet basics, HTML tags, attributes and write simple web pages (K1)

**CO2:** Apply DHTML to web pages and make it dynamic (K3)

**CO3:** Compare XML with HTML and develop xml documents. (K4)

**CO4:** Build interactive web pages using Java Script (K6)

**CO5:** Explore PHP constructs and their APIs for web application development (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
<b>CO1</b>	3	2	2	1	1	3	3	-	-	2	2	1	-	20
<b>CO2</b>	2	2	2	1	1	3	3	-	-	2	2	2	-	20
<b>CO3</b>	3	2	2	2	2	3	3	-	-	2	2	2	-	23
<b>CO4</b>	3	3	2	2	2	3	3	-	-	2	2	2	-	24
<b>CO5</b>	3	2	2	2	2	3	3	-	-	2	2	2	-	23
<b>Grand total of COs with PSOs and POs</b>														<b>110</b>
<b>Mean Value of COs with PSOs and POs</b> = Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(110/50)														<b>2.2</b>

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.2
Observation	COs of Advanced Web Technology is strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class** : M.Sc., Computer Science **Part** : Core Elective-2  
**Semester** : II **Hours** : 60  
**Subject Code** : 24PCSE22 (A) **Credit** : 4

**CRYPTOGRAPHY AND NETWORK SECURITY**

**Objectives:**

The course enables the students to

- Understand the fundamental needs of Secure System Design
- Analyze critically about key concept and Techniques
- Understand the overview of the Algorithms
- Compare the Symmetric, Asymmetric and RSA Algorithm
- Identify and mitigate the various Internet Security Protocols.

**UNIT I** **12 Hours**

**Introduction to the Concept of Security:** Introduction, the Need of Security, Security Approaches, Principal of Security, Types of Attacks

**UNIT - II** **12 Hours**

**Cryptographic Techniques:** Introduction, Plain Text and Cipher Text, Substitution Techniques, Transposition Techniques, Encryption and decryption, Symmetric and Asymmetric Key Cryptography, Steganography, Key Range and Key Size, Possible Types of Attacks

**UNIT – III** **12 Hours**

**Computer-based Symmetric Key Cryptographic Algorithms:** Introduction, Algorithm Types and Models, An Overview of Symmetric Key Cryptography, Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), RC5, Blowfish, Advanced Encryption Standard (AES), Differential and Linear Cryptanalysis

**UNIT – IV** **12 Hours**

**Computer-based Asymmetric Key Cryptographic Algorithms:** Introduction, Brief History of Asymmetric Key Cryptography, An Overview of Asymmetric Key Cryptography, The RSA Algorithm, Symmetric and Asymmetric Key Cryptography Together, Digital Signatures.

**Unit- V** **12 Hours**

**Network Security:** Brief Introduction to TCP/IP, Firewalls, IP Security, Virtual Private Networks (VPN), **Internet Security Protocols:** Basic Concepts, Security Socket Layer (SSL), Secure Hyper Text Transfer Protocol (SHTTP), Time stamping Protocol (TSP), Secure Electronic Transaction (SET)

**Book for Study**

1. Kahate Atul, *Cryptography and Network Security*, Third Edition, Tata McGraw Hill Publication, New Delhi, 2006.

## Book for Reference

1. Forouzan Behrouz A., Mukhopadhyay Debdeep, *Cryptography & Network Security*, Second Edition, McGraw Hill, New Delhi, 2010
2. Stallings William, *Cryptography and Network Security: Principles and Practices*, Seventh Edition, Prentice Hall, 2014.

## Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

## Course Outcomes

On the successful completion of the course students will be able to:

**CO1:** Understand Cryptography and Network Security concepts and applications. (K2)

**CO2:** Demonstrate and APPLY the process of Basic Concepts of Secure system design. (K3)

**CO3:** Identify and Analyse Network and Security Threat. (K4)

**CO4:** Understand the concepts of Asymmetric key cryptography (K2)

**CO5:** Evaluate the various Network Security protocols (K5)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

## Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	-	-	3	2	2	-	2	2	1	2	3	22
CO2	3	2	-	-	1	2	2	-	3	2	1	2	2	20
CO3	3	2	-	-	1	2	2	-	2	2	1	2	3	20
CO4	2	3	-	-	1	2	2	-	2	2	1	2	2	19
CO5	2	2	-	-	2	1	2	-	2	2	-	2	3	18
<b>Grand total of COs with PSOs and POs</b>														<b>99</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(99/49)</b>														<b>2.05</b>

**Strong – 3, Medium -2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.05
Observation	COs of Cryptography and Network Security – Medium related with PSOs and POs		



### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

### Course Outcomes

On the successful completion of the course students will be able to

**CO1:** Understand and identify the cellular systems for mobile computing. (K2)

**CO2:** Explore Medium access control strategies and techniques (K6)

**CO3:** Understand satellite communication and broadcast systems (K2)

**CO4:** Explore Wireless ATM architecture and their design standards (K4)

**CO5:** Create and build software for mobile computing applications (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	-	-	3	2	2	-	3	1	3	2	3	24
CO2	3	2	-	-	3	2	2	-	3	1	3	2	3	24
CO3	3	2	-	-	3	2	2	-	3	1	3	2	3	24
CO4	2	3	-	-	3	2	2	-	3	1	3	2	3	24
CO5	2	2	-	-	3	2	2	-	3	1	3	2	3	23
<b>Grand total of COs with PSOs and Pos</b>														<b>119</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(119/50)</b>														<b>2.38</b>

**Strong -3 , Medium -2 , Low -1**

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.38
Observation	COs of Mobile Computing – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class** : M.Sc., Computer Science  
**Semester** : II  
**Subject Code** : 24PCSSP32

**Part** : Core Lab - 3  
**Hours** : 75  
**Credit** : 3

**Advanced Web Technology Lab**

**Objectives:**

The course enables the students to

- Understand the salient attributes of mark-up language such as HTML.
- Learn the concepts of CSS and its applications in Internet Programming
- Learn the fundamentals of Scripting and querying
- Explore server-side programming and web Application development
- Create trivial and simple Database oriented web Application

**HTML**

1. Types Of List
2. Class Time Table
3. Advertisement Using Frame Set
4. School Website Using Frames
5. College Website Using Div Tag
6. Application Form Using Form Elements

**STYLE SHEET (CSS)**

7. Including CSSIn Head
8. Linking External CSS
9. Importing External CSS
10. Inline Style Sheet
11. Applying Classes In CSS
12. Positioning Images Using Img And Div Tags

**JAVA SCRIPT and JQUERY**

13. Timely Wishes
14. Biggest And Smallest
15. Area And Perimeter
16. Simple And Compound Interest
17. Calculator
18. Digital Clock
19. Online Exam
20. History Object
21. All Collection
22. Style Sheet Collection

## PHP& MYSQL

23. Create Table
24. Insert Records
25. Select Records
26. Update And Delete Records
27. Prepare Statements
28. Exam Result Publishing

## COURSE OUTCOMES

On successful completion of the course students will be able to

**CO1:** Design and Development of simple HTML static forms (K3)

**CO2:** Create CSS-based simple interactive forms (K6)

**CO3:** Create simple web page script using Java script (K6)

**CO4:** Design and develop simple server-side application (K3)

**CO5:** Incorporate AJAX and its related attributes to web application (K5)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course outcome with POs and PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	1	2	1	3	3	-	-	1	2	2	-	20
CO2	3	2	2	2	1	3	2	-	-	2	2	2	-	21
CO3	3	2	2	1	2	3	2	-	-	2	3	2	-	22
CO4	3	2	2	1	2	3	2	-	-	2	3	2	-	22
CO5	3	2	2	1	2	3	3	-	-	2	2	3	-	23
														108
	<b>Mean Value of COs with PSOs and POs</b> <b>=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(108/50)</b>													2.16

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.16
Observation	COs of Advanced Web Technology is strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : M.Sc., Computer Science**

**Part : Core Lab - 4**

**Semester : II**

**Hours : 75**

**Subject Code : 24PCSP42**

**Credit : 3**

**Python Programming Lab**

**Objectives:**

The course enables the students to

- Understand the basic concepts in Python Data Types and Control Flow
- Develop Python programs with conditionals and loops and data structures
- Build list, tuple, dictionaries
- Develop program using OOPs concepts in Python
- Design and program Python applications with database.

**Program List**

1. Write a program to demonstrate different number data types in Python.
2. Write a program to perform different Arithmetic Operations on numbers in Python.
3. Write a program to create, concatenate and print a string and accessing sub-string from a given string.
4. Write a python script to print the current date in the following format Sun May 29 02:26:23 IST 2017
5. Write a python program to find largest of three numbers.
6. Write a Python program to convert temperatures to and from Celsius, Fahrenheit. [ Formula :  $c/5 = f-32/9$  ]
7. Write a Python program to construct the loop pattern by using special symbol
8. Write a program to create, append, and remove lists in python.
9. Write a Python program to clone or copy a list
10. Write a program to demonstrate working with tuples in python.
11. Write a program to demonstrate working with dictionaries in python.
12. Write a Python script to sort (ascending and descending) a dictionary by value
13. Write a python program to define a module and import a specific function in that module to another program.
14. Write a script named copyfile.py. This script should prompt the user for the names of two text files. The contents of the first file should be input and written to the second file.
15. Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order.
16. Write a Python class to implement  $\text{pow}(x, n)$
17. Write a Python class to reverse a string word by word.
18. Design a simple database application that stores the records and retrieve the same.
19. Design a database application to search the specified record from the database.
20. Design a database application to that allows the user to add, delete and modify the records.

## COURSE OUTCOMES

On the successful completion of the course the students will able to

**CO1:** Write simple Python programs for solving problems.(K3)

**CO2:** Decompose a Python program into functions.(K3)

**CO3:** Manipulate compound data types and files in Python Programs.(K4)

**CO4:** Write programming using OOPs concepts in python.(K3)

**CO5:** Create the Python application for real world problems.(K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	2	3	1	2	3	-	-	3	3	-	3	3	26
CO2	3	2	3	1	2	2	-	-	3	3	-	3	2	24
CO3	3	2	3	1	2	3	-	-	3	3	-	2	3	25
CO4	3	1	2	1	2	3	-	-	3	3	-	3	3	24
CO5	3	1	2	1	1	3	-	-	3	3	-	3	3	23
<b>Grand total of COs with PSOs and POs</b>														<b>122</b>
<b>Mean Value of COs with PSOs and POs=122/50</b> (MV= Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs)														<b>2.44</b>

**Strong -3, Medium -2 , Low -1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.44
Observation	COs strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: M.Sc., Computer Science</b>	<b>Part : NME</b>
<b>Semester</b>	<b>: II</b>	<b>Hours : 60</b>
<b>Subject Code</b>	<b>: 24PCSN12</b>	<b>Credit : 4</b>

**SOFTWARE LICENSE MANAGEMENT**

**Objectives:**

On completion of this course, students able to

- Understand open source technology for development of web applications
- Understand the Principles and methodologies in open source software
- Identify and study the problems with traditional commercial software
- Develop the open source project and its design
- Compare the open source and closed source

**UNIT I**

**(12 HOURS)**

Introduction: Open Source, Free Software, Free Software vs. Open Source software, Public Domain Software, FOSS does not mean any cost. History: BSD, The Free Software Foundation and the GNU Project.

**UNIT II**

**(12 HOURS)**

Open Source History, Initiatives, Principle and methodologies. Philosophy: Software Freedom, Open Source Development Model Licenses and Patents: What Is A License, Important FOSS Licenses (Apache, BSD, GPL, LGPL), copyrights and copylefts, Patents Economics of FOSS: Zero Marginal Cost, Income-generation opportunities, Problems with traditional commercial software, Internationalization

**UNIT III**

**(12 HOURS)**

Case Studies: Apache, BSD, Linux, Mozilla (Firefox), Wikipedia, Joomla, GCC, Open Office.

**UNIT IV**

**(12 HOURS)**

Starting and Maintaining an Open Source Project, Open Source Hardware, Open Source Design, Open source Teaching. and Open source media.

**UNIT V**

**(12 HOURS)**

Open source vs. closed source Open source government, Open source ethics, Social and Financial impacts of open source technology, Shared software, Shared source.

**Book for Study:**

1. Vadera Kailash, Gandhi Bhavyesh, *Open Source Technology*, Laxmi Publications, 2018

**Book for Reference:**

1. Ambawade Dayanand, Shah Deven, *Linux Labs and Open Source Technologies*, Kindle Edition, 2016

**Teaching Methods**

- Lecturing
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

## Course Outcomes

**CO1:** Implement various applications using build systems (K3)

**CO2:** Understand the installation of various packages in open source operating systems (K2)

**CO3:** Identify and evaluate the problems with traditional commercial software (K4)

**CO4:** Understand various version of control systems and the open source projects (K2)

**CO5:** Analysis the need of open source technology, open source development model, application of open sources, aspects of open source movement (K4)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course outcome with PO and PSO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO2	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO3	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO4	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO5	3	3	-	-	2	3	2	2	3	2	3	3	3	30
<b>Grand total of COs with PSOs and POs</b>														<b>150</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(150/55)</b>														<b>2.72</b>

**Strong - 3, Medium - 2, Low – 1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.72
Observation	COs of Software License Management – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514

DEPARTMENT OF COMPUTER SCIENCE

VALUE ADDED COURSE

Course Code : Semester : Odd  
Hours : 30

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IMAGE EDITING AND VIDEO MAKING

Learning Outcomes

- Understand the working environment of the Photoshop
- Identifying the tools and layers
- Considerate the video editing techniques

Unit I

10 Hours

**Introduction:** The Photoshop Interface - setting up a new Photoshop document - Saving a new document Introduction to Photoshop - Components of Photoshop - Classification of images - Properties of images - File formats.

UNIT II

10 Hours

**Tools and Transforms:** Parts of the Toolbox, Toolbox Shortcuts, Tools Options - Using Free transform - **Layers and Channels:** About Layers-Fill and adjustment layers, The Layer Palette, Naming Layers, Creating Layers, Deleting Layers, Viewing Layers, Moving Layers, Layer Opacity, Locking Layers, Merging Layers, Layer modes and blending options, Image and text editing.

Unit III

10 Hours

**Video Making:** Introduced to the video editing workspace - import files, capture video, manage media, use the Storyboard feature, and working with clips in the Timeline panel - edit video, create transitions - creating supers, titles, and credits.

References

1. Richard Schrand. Photoshop 6 visual JumpStart, 2000, Adobe Press.
2. Robert M. Goodman, "Editing Digital Video, The complete creative & technical guide"2002, McGraw-Hill Education.

Course Outcome (CO):

On successful completion of the course the students able to

**CO1:** Understand the basic tools in Photoshop. (K2)

**CO2:** Perform image manipulation. (K3)

**CO3:** Able create and edit video. (K3)

K1=Remember, K2= Understand, K3 = Apply, K4 =Analyze, K5 =Evaluate, K6 = Create

Objectives Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	3	-	-	2	2	2	-	1	-	-	1	1	15
CO2	3	2	-	-	1	2	2	-	1	-	-	1	1	13
CO3	3	2	-	-	1	2	2	-	1	-	-	1	1	13
Grand Total of COs with POs PSOs														41
<b>Grand total with PSOs and POs</b> <b>Mean value of COs with PSOs and POs = <math>\frac{41}{24}</math> = (41/24)</b> <b>Number of COs relating with PSOs &amp; POs</b>														<b>1.7</b>

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**VALUE ADDED COURSE**

**Course Code** : Semester : Odd  
**Hours** : 30 Hours

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**Responsive Web Development**  
**(To be introduced from the academic year 2023-24)**

**Learning Outcomes**

- Understanding the role and functions Internet
- Write HTML and understand how to effectively implement it in the web environment.
- Write CSS effectively to create well organized, styled web pages and Create Dynamic Web Pages using Java Script

**UNIT I: (10 Hours)**

Introduction to Internet- World Wide Web, Internet Addressing, Browser, URL, Web server, website, homepage, Domain Name, Basic concepts. HTML Tags and Attributes, HTML Basic Tags, Formatting Tags, HTML Color Coding, Div and Span Tags for Grouping. Lists: Unordered Lists, Ordered Lists, Definition list. Images: Image and Image Mapping Hyperlink: URL - Uniform Resource Locator, URL Encoding.

**UNIT II: (10 Hours)**

Table: <table>. <th>, <tr>, <caption>, <thead>, <tbody>, <tfoot>, <colgroup>, <col>. Attributes using Iframe as the Target, Frame and Frameset Tags, Audio and Video Tags, Form: <input>, <textarea>, <button>, <select>, <label> Headers: Title, Base, Link, Styles, Script HTML Meta Tag, XHTML

**UNIT III: (10 Hours)**

CSS: Introduction, Features and benefits of CSS, CSS Syntax, External Style Sheet using, Multiple Style Sheets, Value Lengths and Percentages. Color Background Cursor: background-image, background-repeat, background-position. The JavaScript: Nature of JavaScript, Script Writing Basics, Enhancing HTML Documents with JavaScript, the Building Blocks.

**References**

1. Jon Duckett, HTML And CSS: Design And Build Websites, Wiley
2. Jon Duckett, JavaScript And JQuery: Interactive Front-End Web Development, Wiley
3. Jennifer Niederst Robbins, Learning Web Design: A Beginner's Guide To HTML, CSS, JavaScript, And Web Graphics, O'reilly
4. <https://www.w3schools.com/>
5. <https://spoken-tutorial.org/>

### Course Outcomes

CO1: Understand the functioning of Internet

CO2: Design static Web pages using HTML

CO3: Design responsive web pages using CSS & JavaScript

Objectives Outcome	PSO	PSO	PSO	PSO	PSO	PO	Sum ofCOs with PSOs & POs							
	1	2	3	4	5	1	2	3	4	5	6	7	8	
CO1	3	2	2	3	2	2	-	-	3	3	-	3	3	26
CO2	3	2	1	2	-	3	-	-	3	3	-	2	2	21
CO3	3	2	1	2	3	3	-	-	2	2	-	2	1	21
	Grand Total of COs with Pos PSOs													68
	Grand total with PSOs and POs Mean value of COs with PSO and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& Pos}}$ = (68/29)													2.34

Strong – 3, Medium -2, Low – 1

ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514

DEPARTMENT OF COMPUTER SCIENCE

VALUE ADDED COURSE

Course Code : Semester : Odd  
Hours : 30

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**Hardware and Networking**

**(To be introduced from the academic year 2023-24)**

**Learning Outcomes**

The course enables the students to

1. Gain knowledge about the PC components
2. Gain knowledge about the Mother boards & Input Devices.
3. To gain knowledge about the Networks and Topology

**UNIT - I (10 Hours)**

**CPU:** Layout of a typical desktop – Types of computer – Generation of computer. Power supply: Connecting the power supply – AT style power connections – Drive power connections – Voltage tolerances. Parallel port –Serial port – Accelerated graphics port.

**UNIT - II (10 Hours)**

**Input & Output Devices:** Keyboard – Construction – Interfaces. Mouse: Construction – Mechanical and optical - Mechanical sensors – Trackball. Printers: Dot matrix printers – Ink jet printers – Laser/LED printers–Monitors – Types of monitor

**UNIT - III (10 Hours)**

**Types of Networks** – Types of Topologies - Networking Software & Hardware - Protocol Hierarchies – Connection oriented and connectionless service.

**References**

1. Craig Zacker& John Rourke, *PC Hardware: The complete reference*, Tata Mc - Graw hill, 1st Edition 2012..
2. Andrew S. Tanenbaum and Wetherall J. David, *Computer Networks*, 5<sup>th</sup> Edition, 2013, PHI.

**Teaching Methods**

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

**Course Outcomes:**

On Successful completion of the course the students able to

**CO 1:** Identify the main components of PC, power supplies and various ports (K2)

**CO 2:** Understand the working of input and output devices (K3)

**CO 3:** Analyze the working of Network (K4)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

Objectives Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO2	2	2	2	1	1	3	3	-	-	2	2	2	-	20
CO3	3	2	2	2	2	3	3	-	-	2	2	2	-	23
Grand Total of COs with POs PSOs														63
Grand total with PSOs and POs														
Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}}$ = ( 63/30)														2.1

**ARUL ANANDAR COLLEGE (Autonomous) Karumathur – 625514**  
**DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS**  
**VALUE ADDED COURSE**

**Course Code** : **Semester** : Even  
**Hours** : **30 Hrs**

**Data Analysis using Advanced Excel**  
**(To be introduced from the academic year 2023-24)**

**Learning Outcomes**

After completion of this course- the learner will able to

- apply analysis techniques to datasets in Excel.
- practice Excel functions and techniques for analysis.
- analyse Pivot Tables and Pivot Charts to streamline your workflow in Excel.

**UNIT – I: INTRODUCTION TO EXCEL (10 Hours)**

About Excel & Microsoft-Uses of Excel- Excel software- Spreadsheet window pane- Title Bar- Menu Bar- Standard Toolbar- Formatting Toolbar- the Ribbon- File Tab and Backstage View- Formula Bar- Workbook Window- Status Bar- Task Pane- Workbook & sheets- Selecting Columns & Rows- Changing Column Width & Row Height- Autofitting Columns & Rows- Hiding/Unhiding Columns & Rows- Inserting & Deleting Columns & Rows- Cell- Address of a cell- Components of a cell – Format- value- formula- Use of paste and paste special

**UNIT – II: CREATING FORMULAS. (10 Hours)**

Using Formulas- Formula Functions – Sum- Average- if- Count- max- min- Proper- Upper- Lower- Using AutoSum- Concatenate- Vlookup- Hlookup- Match- Countif- Text- Trim- Creating PivotTables- Manipulating a PivotTable- Using the PivotTable Toolbar- Changing Data Field- Properties- Displaying a PivotChart- Setting PivotTable Options- . Adding Subtotals to PivotTables

**UNIT – III: Data Analysis (10 Hours)**

Moving between Spread sheets- Selecting Multiple Spread sheets- Inserting and Deleting Spreadsheets Renaming Spreadsheets- Splitting the Screen- Freezing Panes- Copying and Pasting Data between Spreadsheets- Hiding - Protecting worksheets- Sorting- Filter- Text to Column- Data Validation- Creating Charts- Different types of chart- Formatting Chart Objects- Changing the Chart Type- Showing and Hiding the Legend- Showing and Hiding the Data Table

## Web References

1. <https://www.python.org>
2. <https://www.w3schools.com/python/>
3. <https://www.programiz.com/python-programming>

## Course Outcomes

After completion of this course- the learner will able to

- **CO1** apply analysis techniques to datasets in Excel. (K3)
- **CO2** practice Excel functions and techniques for analysis. (K2)
- **CO3** analyse Pivot Tables and Pivot Charts to streamline your workflow in Excel. (K4)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
<b>CO1</b>	3	3	3	3	3	3	1	-	3	3	3	3	3	<b>34</b>
<b>CO2</b>	3	3	2	3	3	2	-	-	3	3	3	3	3	<b>31</b>
<b>CO3</b>	3	3	3	3	3	3	-	-	3	3	3	3	3	<b>33</b>
<b>Grand total of COs with PSOs and POs</b>														<b>98</b>
<b>Grand total with PSOs and POs</b>														
<b>Mean value of COs with PSO and POs =2.88</b> <span style="float: right;"><b>= (98/34)</b></span>														<b>2.88</b>
<b>Number of COs relating with PSOs&amp; POs</b>														

**ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**VALUE ADDED COURSE**

**Course Code** : Semester : Even  
**Hours** : 30

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**INTERNET OF THINGS**  
**(To be introduced from the academic year 2023-24)**

**Learning Outcomes**

The course enables the students to

- Understand the Basic concepts in IoT
- Analyze various IoT Devices
- Analyze various case studies in IoT Applications

**UNIT – I: INTRODUCTION TO IOT (10 HOURS)**

Definition of the Internet of Things - main assumptions and perspectives- Platform for IoT devices - Economics and Technology of the IoT -Architecture of IoT.

**UNIT - II IOT DEVICES (10 HOURS)**

Temporary and Ad-hoc devices - Addressing issues - End devices in dedicated networks - Small data Building a web of things - Role of integrator function.

**UNIT –III CASE STUDIES ILLUSTRATING IOT DESIGN (10 HOURS)**

Home Automation - Cities - Environment - Agriculture - Productivity Applications

**References**

1. Da Francis, Costa, *Rethinking the Internet of Things-A scalable approach to connecting everything*, 2013, Apress open publication.
2. WaherPeter, *Learning Internet of Things*, 2015, PACKT Publishing-Birmingham-Mumbai.
3. BahgaArhdee, MadisetiVijay, *Internet of Things: A Hands on Approach* (<http://www.internet-of-things-book.com/>). 2015.
4. PfisterCuno, *Getting started with the Internet of Things*, O’Rielly Publication.2011.

**Web Reference:**

1. Introduction to IoT:<https://www.javatpoint.com/iot-internet-of-things>
2. Architecture of IoT :<https://www.geeksforgeeks.org/architecture-of-internet-of-things-iot/>
3. IoT Devices :[https://www.tutorialspoint.com/internet\\_of\\_things/index.htm](https://www.tutorialspoint.com/internet_of_things/index.htm)
4. IoT Human Interaction :  
<https://www.digimat.in/nptel/courses/video/106106177/L01.html>
5. IoT designs :<https://nlist.inflibnet.ac.in/search/Record/EBC5332124>

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

### Course Outcomes

On the successful completion of the course students will be able to:

**CO1:** Understand the basic concepts in IoT. (K2)

**CO2:** Analyze various IoT Devices. (K4)

**CO3:** Analyze various case studies in IoT Applications. (K4)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

Objectives Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO2	2	2	2	1	1	3	3	-	-	2	2	2	-	20
CO3	3	2	2	2	2	3	3	-	-	2	2	2	-	23
Grand Total of COs with POs PSOs														63
Grand total with PSOs and POs														
Mean value of COs with PSOs and POs = _____														
= ( 63/30)														
Number of COs relating with PSOs & POs														2.1

ARUL ANANDAR COLLEGE (Autonomous) Karumathur – 625514

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS

VALUE ADDED COURSE

Course Code : Semester : Even  
Hours : 30 Hrs

**PYTHON PROGRAMMING**

(To be introduced from the academic year 2023-24)

**Learning Outcomes**

After completion of this course, the learner will able to

1. identify and list various data store formats and data visualization techniques
2. practice various regression and correlation analysis on the given data set
3. export and import data from one platform into another platform

**UNIT – I: CORE PROGRAMMING CONSTRUCTS (10 Hours)**

Primitive Data types – operators – statements – control structures – conditional constructs – looping constructs – List – Tuples – set – Dictionaries – functions – files - Database Programming with mysqlDB – Creating table objects – manipulating table objects – SQL statements

**UNIT – II: LIBRARY FOR DATA ANALYSIS (10 Hours)**

The NumPy Library: Creating an array object – Intrinsic creation of an array – Aggregate functions – Iterating arrays – Universal functions – Correlation – Regression Analysis  
The Pandas Library: Data Series – The Data frame – dropping – Arithmetic and data alignment – Flexible Arithmetic methods – Operation between Data frame and series – Functions by rows – Functions by columns – Statistics functions – Sorting and Ranking

**UNIT – III: LIBRARY FOR DATA VISUALIZATION (10 Hours)**

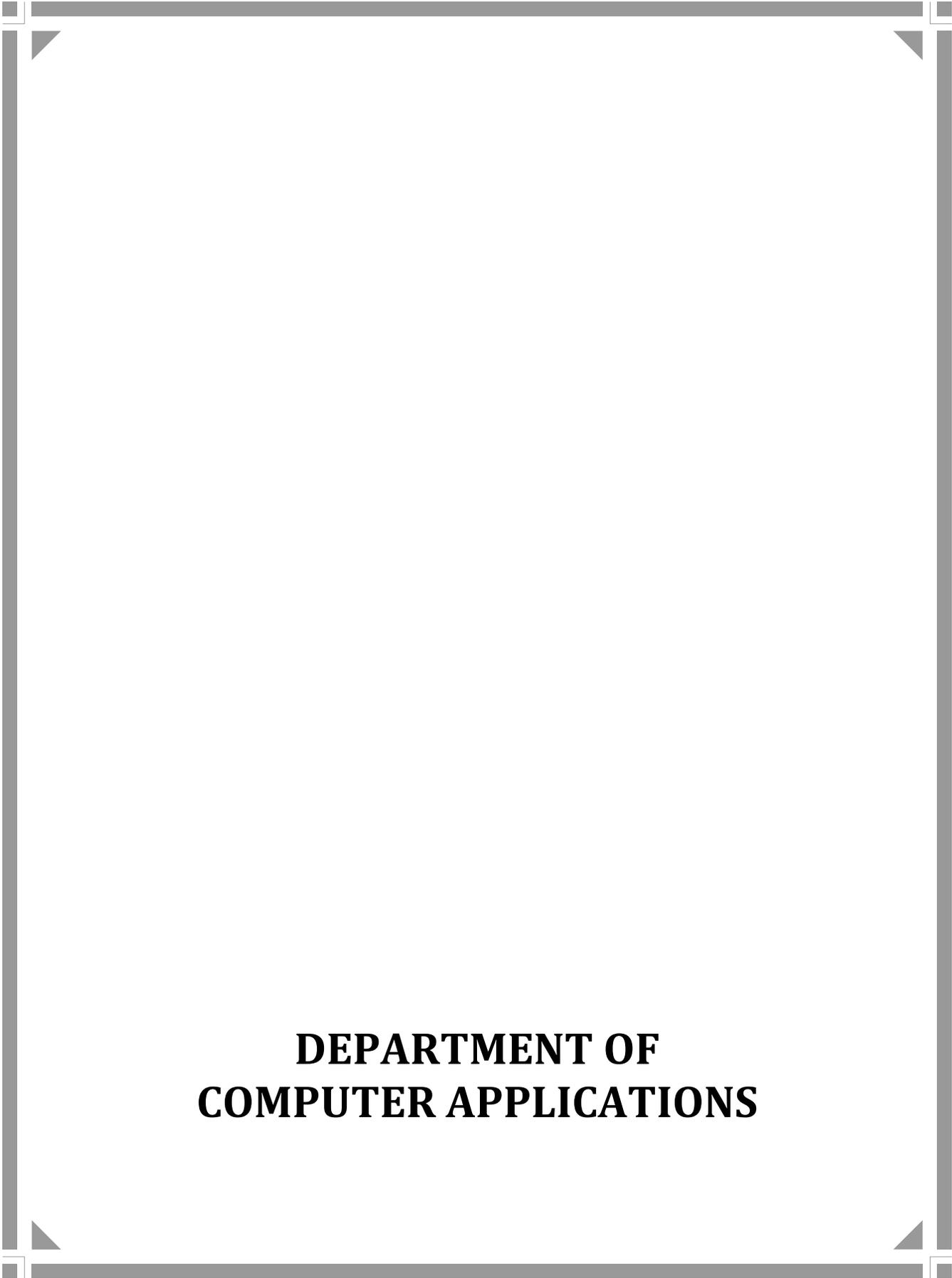
The Matplotlib library: matplotlib architecture – Backend layer – Artist Layer – Scripting layer – the Pyplot library – working with multiple figures and axes – adding text – adding grid – adding legends – handling Date values – Chart typology – Line chart – Histogram – Bar chart – Pie chart – Advanced charts – mplot3D – multi panel plots

**Text References**

1. Fabio Nelli, Python Data Analytics: Data Analysis and Science using pandas, matplotlib and the python programming language, APress , 2015

**Web References**

1. <https://www.python.org>
2. <https://www.w3schools.com/python/>
3. <https://www.programiz.com/python-programming>



**DEPARTMENT OF  
COMPUTER APPLICATIONS**



**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**CBCS and OBE Pattern**  
**BCA – Programme**  
**(Those who join from 2023 - 2024 onwards)**

<b>SEMESTER – I</b>				
<b>Part</b>	<b>Subject Code</b>	<b>Title of the paper</b>	<b>Hours</b>	<b>Credits</b>
I	23UTML11/ 23UHNL11/ 23UFNL11	Tamil/ Hindi/French	06	04
II	23UENB11	English through Prose & Short Story – Stream - B	05	04
III	23UBCC11	<b>Core: 1 Python Programming</b>	05	04
	23UBCC22	<b>Core: 2 Digital Computer Fundamentals</b>	04	03
	23UBCP11	<b>Core Lab: 1 Python Programming –Practical</b>	05	03
	23UBCA11	<b>Allied: 1 Problem Solving Techniques using C</b>	03	03
IV	23UFCE11	FC – Personality Development	1	1
	23UCSH12	Communication Skill	1	-
	23UBRC11	Bridge Course	-	1
V	23UNSS/NCC/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NCC / NSS / Phy.Edn. / YRC /ROTARACT /AICUF / Nature Club	---	---
<b>Total</b>			<b>30</b>	<b>23</b>
<b>SEMESTER – II</b>				
I	23UTML22/ 23UHNL22/ 23UFNL22	Tamil/Hindi/French	06	04
II	23UENB22	English through Prose & Poetry - Stream B	05	04
III	23UBCC32	<b>Core: 3 Java Programming</b>	05	04
	23UBCC42	<b>Core: 4 Web Designing</b>	04	03
	23UBCP22	<b>Core Lab: 2 Java Programming – Practical</b>	05	03
	23UBCA22	<b>Allied: 2 Discrete Mathematics</b>	03	03
IV	23UFCH22	FC – Social Responsibility and Global Citizenship	1	1
	23UCSH12	Communication Skill	1	1
V	23UNSS/NCC/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NSS/NCC/Phy.Edn./ YRC /ROTARACT/AICUF/Nature Club	-	1
<b>Total</b>			<b>30</b>	<b>24</b>

<b>SEMESTER – III</b>				
	23UTML33/ 23UHNL33/ 23UFNL33	<b>Tamil</b>	06	04
	23UBCC53	<b>Core: 5 Relational Database Management System</b>	04	04
	23UBCC63	<b>Core: 6 Data Structures and Algorithms</b>	04	03
	23UBCC73	<b>Core: 7 Operating System</b>	04	03
	23UBCP33	<b>Core Lab: 3 RDBMS – Practical</b>	05	03
IV	23UBCA33	<b>NME: 1 Web Designing (For Arts students)</b>	03	02
	23UBCN13	<b>Allied 3: 1 Numerical Aptitude</b>	03	02
	23UFCE33	FC – Environmental Studies	01	01
V	23UNSS/NCC/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NCC / NSS / Phy.Edn. /YRC /ROTARACT / AICUF / Nature Club	-	-
	23UARE14	ARISE		
		<b>Total</b>	<b>30</b>	<b>22</b>
<b>SEMESTER – IV</b>				
	23UTML33/ 23UHNL33/ 23UFNL33	<b>Tamil</b>	06	04
	23UBCC84	<b>Core: 8 Web Programming</b>	04	04
	23UBCC94	<b>Core: 9 Linux and Shell Programming</b>	04	03
	23UBCD01	<b>Core: 10 Computer Networks</b>	04	04
	23UBCP44	<b>Core Lab: 4 Web Programming – Lab</b>	05	03
	23UBCA44	<b>Allied 4: Operation Research</b>	03	02
IV	23UBCN24	NME: 2 Web Designing (For Science Students)	03	02
	23UFCH44	FC – Religious Literacy and Peace Ethics	01	01
V	23UNSS/NCC/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NCC / NSS / Phy.Edn. /YRC /ROTARACT / AICUF / Nature Club	-	01
	23UARE14	ARISE	-	01
		<b>Total</b>	<b>30</b>	<b>25</b>
<b>SEMESTER – V</b>				
III	23UBCD11	<b>Core: 11 Big Data Analytics</b>	05	05
	23UBCD12	<b>Core: 12 Mobile Computing</b>	05	05
	23UBCD13	<b>Core: 13 Programming using ASP.Net</b>	05	05

	23UBCD14	<b>Core: 14 Network Security and Cryptography</b>	05	04
	23UBCP55	<b>Core Lab: 5 Programming using ASP.Net –Practical</b>	05	03
	23UBCE15 (A) 23UBCE15 (B) 23UBCE15 (C)	<b>Core Elective:1</b> <b>1. Introduction to Data Science</b> <b>2. Artificial Neural Networks</b> <b>3. Cloud Computing</b>	03	03
IV	23USSI16	Soft Skills	02	-
		<b>Total</b>	<b>30</b>	<b>25</b>
<b>SEMESTER – VI</b>				
III	23UBCD15	<b>Core: 15 Software Engineering</b>	05	04
	23UBCD16	<b>Core: 16 Data Mining and Ware Housing</b>	04	04
	23UBCD17	<b>Core: 17 Mobile Application Development</b>	05	04
	23UBCD18	<b>Core: 18 Internet of Things</b>	05	03
	23UBCD19	<b>Core: 19 Major Project</b>	01	02
	23UBCP66	<b>Core Lab: Mobile Application Development – Practical</b>	05	03
	23UBCE26 (A) 23UBCE26 (B) 23UBCE26 (C)	<b>Core Elective: 2</b> <b>1.Cyber Security</b> <b>2.Artificial Intelligence</b> <b>3.Software Testing</b>	03	03
IV	23USSI16	Soft Skills	02	02
		<b>Total</b>	<b>30</b>	<b>25</b>

#### Credits for each Semester

Semester	I	II	III	IV	V	VI	Total
<b>Credits</b>	23	24	22	25	25	25	<b>144</b>

#### Self-Learning Courses

S.No	Semester	Sub. Code	Title of the Paper	Credits
1.	III		PC Hardware & Troubleshooting	3
2.	IV		Computer Applications in Business	3
3.	V		Internet Basics	3
4.	VI		Ethical Hacking	3

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**RELATIONAL DATABASE MANAGEMENT SYSTEM**

Class	: BCA	Part	: III Core- 5
Semester	: III	Hours	: 60
Subject Code	: 23UBCC53	Credits:	04

**Objectives:**

The course enables the students to

- Understand the basics of database management systems and its architecture
- Apply data manipulation techniques through query languages
- Know the Integrity and Security measures applied on Relational Database
- Differentiate the Normalization techniques to avoid the redundancy of data
- Understand the transaction concepts and concurrency control

**Unit – I**

**12 Hours**

**Introduction:** Database System Applications-DBMS Vs. File System - View of Data-Data Model- Database Languages - Database users and Administrators - Transaction Management - Database System Structure - Application Architecture. **Data Models:** Basic Concepts - Constraint- Keys- ER Diagram -Weak Entity - Extended ER Features - Design of an ER Schema - UML. **Relational Model:** Structure of Relational Databases - Relational Algebra - Views.

**Unit – II**

**12 Hours**

**SQL:** Background-Basic Structure-Set Operation-Aggregate Function-Null Values-Nested Sub Queries- Views - Modification of the Database - Data Definition Language - Embedded SQL - Dynamic SQL.

**Unit-III**

**12 Hours**

**Advance SQL :** Integrity and Security: Domain - Constraint - Referential Integrity - assertions – Triggers. **Security and Authorization:** Authorization in SQL - Encryption and Authentication.

**Unit – IV**

**12 Hours**

**Relational Database Design:** First Normal Form - Pitfalls in Relational Database Design- Functional Dependencies (Second Normal Form) - Boyce-Codd Normal Form - Third Normal Form – Fourth Normal Form - Overall Database Design Process.

## Unit-V

12 Hours

**Transaction Management:** Transaction concepts - States - Serializability. **Lock based concurrency control:** Locks - Granting - Two-Phase Locking protocol. **Time stamp based protocol:** Timestamps -Timestamp ordering protocol - Dead lock handling.

### Book for Study:

1. Silberschatz, H Korth, S Sudarshan, *Database System and Concepts*, seventh Edition, 2019, McGraw-Hill. .

### Book for Reference:

1. Leon Alexis, Leon Mathews, *Fundamentals of DBMS*, Second Edition, 2014, Vijay Nicole Publications.

### Web References:

1. SQL & RDBMS Concepts: [https://www.w3schools.com/mysql/mysql\\_rdbms.asp](https://www.w3schools.com/mysql/mysql_rdbms.asp)
2. DBMS with web: <https://www.slideshare.net/marccdy1/webdbms-a-quick-reference>
3. Relational Database: [https://en.wikipedia.org/wiki/Relational\\_database](https://en.wikipedia.org/wiki/Relational_database)
4. Introduction to DBMS: <https://www.geeksforgeeks.org/dbms/>
5. Basic Concepts: <https://www.javatpoint.com/dbms-tutorial>
6. RDBMS & MongoDB: <https://www.geeksforgeeks.org/difference-between-rdbms-and-mongodb/>

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### Course Outcomes:

On Successful completion of the course the students able to

- CO 1:** Understand the Entity Relationship(ER) and Relational Models for a specific application (K2)
- CO 2:** Build and manipulate relational database using structure query languages (K3)
- CO 3:** Analyze a normalized data base for a given application by incorporating various constraints like integrity and value constraints (K4)
- CO 4:** Differentiate the normal forms to avoid data manipulation anomalies (K3)
- CO 5:** Understand different transaction and concurrency control mechanism to preserve data consistency in a multiuser environment (K2)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

## Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	-	-	2	2	1	-	2	1	1	1	1	16
CO2	3	3	-	-	1	1	1	-	2	1	2	1	1	16
CO3	3	2	-	-	1	2	1	-	1	1	1	1	1	14
CO4	3	3	-	-	1	2	1	-	2	1	1	1	1	16
CO5	3	2	-	-	1	1	1	-	2	2	1	1	1	15
<b>Grand total of COs with PSOs and POs</b>														<b>77</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(77/50)</b>														<b>1.54</b>

Strong – 3, Medium – 2, Low – 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.54	
Observation	COs of Relational Database Management System – Medium related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**DATA STRUCTURES AND ALGORITHMS**

Class : BCA

Part III : Core-6

Semester : III

Hours : 60

Subject Code : 23UBCC63

Credit : 3

**Objectives:**

The course enables the students to

- Understand and remember algorithms and its analysis procedure.
- Understand the concepts of data structures through Stack & Queue ADT
- Familiar with implementation of Linked List data structures
- Familiar with Searching and Sorting algorithms and its complexities
- Apply the concepts of advanced data structure such as binary tree, Hash and Symbol table.

**Unit I**

**12 Hours**

Abstract Data Types – Algorithm – Algorithm Analysis – Goal of Analysis of Algorithm –Running Time Analysis – comparing Algorithms – Types of Analysis – Recursion and Back Tracking.

**Unit II**

**12 Hours**

**Stacks and Queues:** Fundamentals-Stack- usage of Stack- Stack ADT- Applications-Queue- usage of Queue - Queue ADT-Operations-Applications.

**Unit III**

**12 Hours**

**Linked Lists:** Linked List– Linked List ADT – Comparison of linked list with Arrays – Singly linked list – Doubly linked list –Circular linked list.

**Unit IV**

**12 Hours**

**Searching and Sorting:** Types of Searching – Linear search types – Binary Search – Interpolation search – Sorting – Classification of sorting – Bubble sort- Insertion sort –Selection sort – shell sort –merge sort – heap sort –quick sort – Radix sort – Topological sort – External sorting.

**Unit V**

**12 Hours**

**Tree** – Binary Tree – Binary tree traversal – Generic trees (N-ary trees) – Threaded Binary tree – Expression tree – Binary search tree - AVL tree – Symbol table – Hashing – Hash Functions – Hash tables – Collisions – Collision resolution techniques.

**Book for Study:**

1. Karumanchi Narasimha, *Data Structures and Algorithms Made Easy Data Structure and Algorithmic Puzzles*, Second Edition, 2011, Careermonk Publications.

**Books for Reference:**

1. Mark Allen Weiss, *Data Structures and Algorithm Analysis in C++*, 4<sup>th</sup> edition, 2013, Person Publications.
2. Horowitz Ellitz, Sahni Sartaj, *Data Structures*, Second Edition, 2012, Universities Press.

**Web Reference:**

1. [https://w3.cs.jmu.edu/spragunr/CS240\\_F12/ConciseNotes.pdf](https://w3.cs.jmu.edu/spragunr/CS240_F12/ConciseNotes.pdf)
2. [https://www.tutorialspoint.com/data\\_structures\\_algorithms/dsa\\_quick\\_guide.htm](https://www.tutorialspoint.com/data_structures_algorithms/dsa_quick_guide.htm)
3. <https://www.geektonight.com/data-structures-and-algorithms-notes/>
4. <https://www.javatpoint.com/data-structure-tutorial>

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### Course Outcomes:

On Successful completion of the course the students able to

**CO1:** Analyze the algorithm for the specific problem (K4)

**CO2:** Apply the functions of linear data structures. (K3)

**CO3:** Understand the advanced linear data structure (K2)

**CO4:** Implement appropriate sorting/searching technique for given problem. (K3)

**CO5:** Understand the hashing and function of collision (K2)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

### Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
<b>CO1</b>	2	2	-	-	1	2	2	-	3	2	1	1	1	17
<b>CO2</b>	3	3	-	-	1	2	1	-	2	1	1	1	1	16
<b>CO3</b>	3	2	-	-	1	1	1	-	2	1	2	1	1	15
<b>CO4</b>	3	3	-	-	1	1	1	-	3	2	1	1	2	18
<b>CO5</b>	3	3	-	-	1	1	1	-	3	2	1	1	2	18
<b>Grand total of COs with PSOs and POs</b>														<b>84</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(84/50)</b>														<b>1.68</b>

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.68	
Observation	COs of Data Structures and Algorithms – Medium related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**OPERATING SYSTEM**

Class : BCA

Semester : III

Subject Code: 23UBCC73

Part III : Core 7

Hours : 60

Credits: 03

**Objectives:**

The course enables the students to

- To acquire the basic knowledge of operating systems architecture and components and to know the various operations performed by Operating System
- Understanding the importance of Process and Scheduling
- Providing a knowledge issue in Synchronization and Deadlocks
- Describe the concept of Various Memory Management Techniques
- To gain the importance of Files, Directories and Mass Storage

**Unit I**

**(12 Hours)**

**Introduction:** Operating System Definition – Computer System Organization – Types of Operating System – Operating System Structures - Operating System Operation. **System**

**Structures:** Operating System Services – System Calls – System Programs – Operating System Design and Implementation - Operation System Generation - System Boot

**Unit II**

**(12 Hours)**

**Process Concept:** Process Concept - Process Scheduling – Operation on Processes - Inter Process Communication - Example of IPC System – Communication in Client – Server system.

**Process Scheduling:** Basic concept - Scheduling criteria - Scheduling algorithm - Thread Scheduling-Multiple Processor Scheduling - Real Time CPU Scheduling - Operating system example - Algorithm evaluation

**Unit III**

**(12 Hours)**

**Synchronization:** Background - The Critical section problem - Peterson’s solution - Semaphores – Classic problems of Synchronization. **Deadlock:** System models - Deadlock Characterization- Methods for handling deadlock - Deadlock Prevention - Deadlock Avoidance - Deadlock detection - Recovery from deadlock

**Unit IV**

**(12 Hours)**

**Memory Management:** Background – Swapping - Contiguous Memory allocation – Segmentation – paging. **Virtual Memory Management:** Background - Demand paging - Copy and Write-page replacement - Allocation of Frames - Thrashing

## Unit V

(12 Hours)

**File System:** File Concept - Access Method - Directory and Structure - File Sharing - Protection.

**Implementing File System:** File System Structure - File System implementation - Directory implementation - Allocation Methods - Free Space Management.

**Mass Storage Structure:** Overview of Mass Storage Structure - Disk Structure - Disk Scheduling - Disk Management.

### Book for Study:

1. Abraham Silberschatz, Peter B Galvin, Georg Gagne, Operating System Concepts, Ninth Edition, 2018, Wiley India Private Limited.

### Books for Reference:

1. William Stallings, Operating System, Seventh Edition, 2010, Pearson Education.
2. William Stallings, Operating System: Internals and Design Principles, Seventh Edition, 2012, Prentice Hall India Learning Private Limited.

### Web References:

1. [https://onlinecourses.nptel.ac.in/noc20\\_cs04/preview](https://onlinecourses.nptel.ac.in/noc20_cs04/preview)
2. <https://www.udemy.com/topic/operating-system-creation>
3. <https://in.coursera.org/learn/os-pku>
4. <https://www.javatpoint.com/best-courses-for-the-operating-system>

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### Course Outcomes:

On Successful completion of the course the students able to

**CO1:** Understand the basic concepts in varies OS. (K1)

**CO2:** Understand the various scheduling techniques and its executions processes. (K2)

**CO3:** Analyze the working principles of deadlock. (K4)

**CO4:** Understand the memory management techniques. (K2)

**CO5:** Analyze files system and mass storage structure of OS. (K4)

**K1=Remember   K2=Understand   K3=Apply   K4=Analysis   K5=Evaluate   K6=Create**

### Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	2	2	-	-	1	2	2	-	3	2	1	1	1	17
CO2	3	3	-	-	1	2	1	-	2	1	1	1	1	16
CO3	3	2	-	-	1	1	1	-	2	1	2	1	1	15
CO4	3	3	-	-	1	1	1	-	3	2	1	1	2	18
CO5	3	3	-	-	1	1	1	-	3	2	1	1	2	18
<b>Grand total of COs with PSOs and POs</b>														<b>84</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(84/50)</b>														<b>1.68</b>

Strong – 3, Medium – 2, Low – 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.68	
Observation	COs of Operating System – Medium related with PSOs and Pos		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICAITONS**

**RDBMS - LAB**

Class : BCA

Part : III Core Lab-3

Semester : III

Hours : 75

Subject Code : 23UBCP33

Credits: 03

**Objectives:**

The course enables the students to

- Understand database concepts, technology to develop database application.
- Manipulate Database using SQL query.
- Extract data from more than one table
- Develop embedded programs using PL/SQL
- Develop database applications using front-end tools and back-end DBMS

**List of Exercises**

1. Write the queries for Data Manipulation and Data Definition Language.
2. Write SQL queries using logical operations and operators.
3. Write SQL query using group by function.
4. Write SQL queries for string functions.
5. Write SQL queries for sub queries, nested queries.
6. Write a program by the use of PL/SQL.
7. Write SQL queries to create views.
8. Write an SQL query to implement JOINS.
9. Write a query for extracting data from more than one table.
10. Write a query to understand the concepts for ROLL BACK, COMMIT & CHECK POINTS.
11. For a given set of relation tables perform the following
  - a. Creating Views (with and without check option), Dropping views, Selecting from a view
12. Write a PL/SQL program using FOR loop to insert ten rows into a database table.
13. Given the table EMPLOYEE (EmpNo, Name, Salary, Designation, DeptID) write a cursor to select the five highest paid employees from the table.
14. Illustrate how to embed PL/SQL in a high-level host language such as C/Java And demonstrates how a banking debit transaction might be done
15. Develop a simple project for student database management system using vb as front end and oracle as back end.

**Outcomes :**

On successful completion of the course students will be able to

**CO1:** Apply DDL & DML for database manipulation (K3)

**CO2:** Apply queries to extract group of records (K3)

**CO3:** Apply TCL commands to manage transactions. (K3)

**CO4:** Develop programs using PL/SQL. (K5)

**CO5:** Develop embedded PL/SQL into a high-level host language for real time problems (k5)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

**Mapping**

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	2	1	2	3	3	-	-	2	1	1	-	20
CO2	2	2	2	2	2	3	2	-	-	2	2	2	-	21
CO3	3	3	2	2	2	3	3	-	-	2	3	3	-	26
CO4	3	2	2	2	1	3	3	-	-	2	2	1	-	21
CO5	3	3	3	1	2	3	3	-	-	2	2	2	-	24
Grand Total of Cos with Pos PSOs														112
Grand total with PSOs and POs														
Mean value of COs with PSOs and POs = $\frac{112}{50}$ = (112/50)														2.24
Number of COs relating with PSOs & POs														

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.24
Observation	COs of RDBMS- Lab Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.**

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**NUMERICAL APTITUDE**

Class : BCA

Part : IV Allied-3

Semester : III

Hours : 45

Subject Code : 23UBCA33

Credits: 2

**Objectives:**

The course enables the students to

- Apply the various techniques to manipulate the numerical values.
- Understand the methods to solve the problems in percentage and Time.
- Understand the methods to solve the Problems in Ratio and Speed.
- Analyze the data from the graphical output.
- Understand the techniques to improve the Analytical and Reasoning skill.

**Unit I**

**(9 Hours)**

**Arithmetics:** Numbers - Progressions (Sequences & Series) –Number Series- LCM and HCF Simplifications – Square roots, Cube roots, - Problems on Numbers - Average.

**Unit II**

**(9 Hours)**

**Percentages** – Profit & Loss - Interest (Simple and Compound) – Partnership - Time and Distance -Time and Work – Surds and Indices.

**Unit III**

**(9 Hours)**

**Ratio & Proportions** - Problems on Ages - Problems on Trains – Boats and Streams – Allegations or Mixture – Calendar.

**Unit IV**

**(9 Hours)**

**Data Interpretation:** Tabulation - Pie Charts - Bar Graphs - Line Graphs -Venn Diagrams (Syllogism).

**Unit V**

**(9 Hours)**

**Work and Time:** Work from days- Days from work- Efficiency ratio – Data Sufficiency .

**Books for Study**

1. Aggarwal R. S, *Quantitative Aptitude for Competitive Examinations*, Seventh Revised Edition, S.Chand and Co Ltd, 2012, New Delhi.
2. Aggarwal .R. S, *Modern Approach to Verbal and Non Verbal Reasoning*”, Revised Edition, S.Chand and Co Ltd., 2012, New Delhi.

**Book for Reference**

1. Barron’s Guide for *GMAT*, 2006, Galgotia Publication, New Delhi.
2. Dinesh Khattar, *Quantitative Aptitude For Competitive Examinations*, 2019, 4<sup>th</sup> Edition, Pearson Publication.

## Web Reference

1. Arithmetic: <https://unacademy.com/course/course-on-quantitative-aptitude-arithmetic/MTXF8I8N>
2. Percentages: <https://www.javatpoint.com/aptitude/percentage>
3. Ratio & Propotion : <https://www.geeksforgeeks.org/ratio-and-proportion-gg/>
4. Data Interpretation(Charts):  
[https://www.tutorialspoint.com/quantitative\\_aptitude/aptitude\\_bar\\_charts.htm](https://www.tutorialspoint.com/quantitative_aptitude/aptitude_bar_charts.htm)
5. Work and Time: <https://www.toppr.com/guides/quantitative-aptitude/work-and-time/>

## Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

## Course Outcomes

On Successful completion of the course, Students able to

**CO1:** Apply the skills to solve numerical problems. (K3)

**CO2:** Understand the techniques to solve the problems based on Percentage and Time.(K2)

**CO3:** Understand the techniques to solve the problem in Ratio and Speed. (K2)

**CO4:** Analyze the data of the graphical output.(K4)

**CO5:** Understand and solve the Analytical problems. (K3)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

## Mapping

Objectives Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
<b>CO1</b>	3	3	-	-	1	2	1	-	2	1	1	1	1	16
<b>CO2</b>	3	3	-	-	2	2	1	-	2	1	1	1	1	17
<b>CO3</b>	3	3	-	-	2	2	1	-	1	2	1	2	1	18
<b>CO4</b>	3	3	-	-	2	1	1	-	1	2	1	2	1	17
<b>CO5</b>	3	3	-	-	1	3	1	-	2	2	1	1	1	18
<b>Grand total of COs with PSOs and POs</b>														<b>86</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(86/50)</b>														<b>1.78</b>

Strong – 3, Medium – 2, Low – 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.78	
Observation	COs of Quantitative Aptitude and Reasoning– Medium related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**WEB DESIGNING**

Class	: BCA	Part IV	: NME-1(Arts students)
Semester	: III	Hours	: 45
Subject Code	: 23UBCN13	Credit	: 02

**Objectives:**

The course enables the student to

- Apply basic HTML concepts in creating program.
- Understand the tags of creating tables, frames and forms.
- Apply CSS concept in design smart web site.
- Understand the usage of Photoshop tools.
- Understand the techniques for image enhancement

**Unit I** **9 Hours**

HTML: Introduction to HTML – title – document tags – fonts – background - heading level tags - creating paragraph and line break – Editing & Formatting.

**Unit II** **9 Hours**

Creating hypertext link and link list – using Inline images – relative URL – horizontal rules.- Tables - Rows – Columns – Cell columns – Centering table. – Frames – Creating two row frames – forms - Image map.

**Unit III** **9 Hours**

Dynamic HTML: CSS: Introduction – Inline styles – Creating styles sheets with the style element – Conflicting styles – Linking external style sheets – Positioning Elements – Backgrounds – Element Dimensions – Text flow and the Box model – user style sheets.

**Unit IV** **9 Hours**

PHOTOSHOP : Introduction – images basics – file formats – GIF, JPEG, PNG, PSG - color palette – layers – creating new images – brushes – grids and guides – scaling and positioning images – moving and merging layers – tool palette – screen capturing – grey styling – animation.

**Unit V** **9 Hours**

Scanning images – Adding text to the images – designing icons – creating background images – color models – color depths – color calibration – creating gradients – oil paint effect.

**Book for Study**

1. Schrand Richard, Photoshop 6 Visual Jumbstrat, Adobe Press, 2000.

**Books for Reference**

1. Deitel, Internet and World Wide Web How to program, Prentice Hall, Third Edition, 2003.
2. Reinhardt Robert, Lentz Warren John, Flash 5 Bible, Hungry Minds Inc, 2001.
3. Meenakshi GM, Web Graphics, SCITECH Publication, 2007.

**Web References:**

1. <https://www.geeksforgeeks.org/html-introduction/>
2. <https://www.educba.com/adobe-photoshop-tools>
3. <https://www.photoshopessentials.com/basics>
4. <https://www.instructables.com/Flash-Animation-Basics>
5. <https://www.simplilearn.com/tutorials/html-tutorial/html-link>
6. <https://ncert.nic.in/textbook/pdf/kect201.pdf>

**Course Outcomes:**

On successful completion of the course students will be able to

CO1: Develop static web pages using HTML program. (K3)

CO2: Develop web pages with table, frame and form tags. (K3)

CO3: Develop Web site using CSS Concepts. (K3)

CO4: Design invitation and flex for real time scenario (K3)

CO5: Understand the concept of Internet. (K2)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

**Mapping**

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	1	1	2	2	-	3	3	-	-	2	2	2	-	18
CO2	2	2	2	2	1	3	3	-	-	2	2	2	-	21
CO3	3	3	2	2	2	3	3	-	-	3	3	3	-	27
CO4	3	2	2	2	1	3	3	-	-	2	3	1	-	22
CO5	3	3	3	2	2	3	3	-	-	2	3	2	-	26
Grand Total of Cos with POs PSOs														114
Grand total with PSOs and POs														
Mean value of COs with PSOs and POs = _____														
=(114/50)														2.28
Number of COs relating with PSOs & POs														

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.28
Observation	COs of Web Designing – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF COMPUTER SCIENCE& APPLICATIONS**

**PC Hardware and Networking**

Class : B.C.A

Part : SLC

Semester : III

Hours : 60

Subject Code :

Credits : 03

**Objectives:**

The course enables the students to

- Gain knowledge about the PC components
- Gain knowledge about the Mother boards & Input Devices.
- To gain knowledge about the Output Devices
- Implement troubleshooting techniques to overcome the problems faced in it
- Understand maintenance techniques and tools

**UNIT - I**

**(12 Hours)**

CPU: Layout of a typical desktop – Types of computer – Generation of computer. Power supply: Connecting the power supply – AT style power connections – Drive power connections – Voltage tolerances. Parallel port –Serial port – Accelerated graphics port.

**UNIT - II**

**(12 Hours)**

Input Devices: Keyboard – Construction – Interfaces. Mouse: Construction – Mechanical and optical - Mechanical sensors – Trackball. Motherboard: structure of motherboard – Types of motherboard.

**UNIT - III**

**(12 Hours)**

Printers: Dot matrix printers – Ink jet printers – Laser/LED printers–Monitors – Types of monitor – CRT – Laser – LED – Graphics adapter – VGA – SGA – Digital Visual Interface (DVI) – Video in Video out (VIVO). Modem: Basic modem construction and operation – Internal and external modem.

**UNIT - IV**

**(12 Hours)**

Troubleshooting: the CPU – Audio and Video – Monitor Display – Hard Disk Drive – Installation of Hardware - Power Supply Function and Operation. OS Installation and preventive maintenance – Troubleshooting tools and Techniques – Basic Data Recovery and Disaster Recovery.

**UNIT - V**

**(12 Hours)**

PC Maintenance: Creating Backup – Creating System Recovery – Removing unused File and Programs - Disk Cleanup – Disk Defragmenting – Maintenance Scheduling.

**Books for Study:**

1. Stephen J. Bieglow, *Troubleshooting, Maintaining and repairing PCs*, Tata Mc–Graw 5<sup>th</sup> Edition, 2013.

### Books for Reference:

1. Craig Zacker & John Rourke, *PC Hardware: The complete reference*, Tata Mc - Graw hill, 1st Edition 2012.
2. Govindarajulu. B, *IBM PC and clones: Troubleshooting and maintenance*, Tata Mc - Graw Hill, 2nd Edition, 2012.

### Course Outcome (CO)

On successful completion of the course students will be able to

**CO1:** Identify the main components of PC, power supplies and various ports (K2)

**CO2:** Explain the function of motherboard and working mechanisms of Keyboard and mouse. (K2)

**CO3:** Illustrate the types of Monitors, Printers, graphic adapters and their mechanisms (K2)

**CO4:** Categorize various modems, soundcards and their working. (K2)

**CO5:** Solve the problems faced in PC by applying the troubleshooting methods. (K3)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

### Mapping

Objectives Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	2	1	2	1	1	3	2	-	-	2	1	1	-	16
CO2	2	2	2	1	1	3	2	-	-	2	2	2	-	19
CO3	3	3	2	1	2	3	3	-	-	2	3	3	-	25
CO4	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO5	3	3	3	1	2	3	3	-	-	2	2	2	-	24
	Grand Total of COs with Pos PSOs													104
	Grand total with PSOs and POs Mean value of COs with PSO and POs = $\frac{104}{50}$ =													2.08
	Number of COs relating with PSOs & Pos													

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.08
Observation	COs of PC Hardware and Troubleshooting – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE& APPLICATIONS**  
**WEB PROGRAMMING**

Class : BCA  
Semester : IV  
Subject Code : 23UBCC84

Part III : Core - 8  
Hours : 60  
Credits: 04

**Objectives:**

The course enables the students to

- explore HTML elements and hyper linked web documents
- explore CSS design patterns and templates
- explore the ways of incorporating external scripts and objects with web documents
- get exposure to develop PHP scripts and applications
- get exposure on database programming and web portal design by using PHP

**Unit – I: Introduction to Web Programming**

**12 Hours**

Creating web pages and web sites – Web page uploads – Web Hosting services - Example page designs – HTML elements – HTML Tags and attributes – Structural elements – Evolution of HTML – HTML governing bodies and forums – Compatibility issues of versions - Body elements – Block elements – coding conventions – comments – Content model categories – Creating hyperlinks – HTML Form elements

**Unit – II: Web Page Design with CSS**

**12 Hours**

Overview – CSS rules – Syntax and Styles – Class selectors – ID selectors – Span and DIV elements – Cascading – Style attributes – Style container – External CSS files – CSS properties – Color properties – RGB Values – Opacity Values – Font properties – Text Properties – Border properties

**Unit – III: Web Page Design with Javascript**

**12 Hours**

Characteristics of Scripting languages - History of Javascript – functions – Variables and Identifiers – Statements and Objects – Document Object Model – Accessing form control values – Reset and Focus methods – Comments – Event handler attributes – Conditional statements – Loop statements.

**Unit – IV: Web Page Design with PHP**

**12 Hours**

Introduction to PHP, server side scripting, role of web server software, PHP comments, variables, echo and print, PHP operators, data types, branching statements, loops, arrays. PHP functions, PHP form, Passing information between pages, \$\_GET, \$\_POST, \$\_REQUEST.

**UNIT – V: Database Connectivity**

**12 Hours**

Introduction to My SQL, datatypes, SQL commands- CREATE, UPDATE, INSERT, DELETE, SELECT, PHP function for MySQL connectivity and operation- mysql\_connect,

mysql\_select\_db, mysql\_query- insertion, updation and deletion of data using PHP, displaying data from MySQL in webpage.

### Books for study

1. John Dean, Web Programming with HTML 5.0, CSS and Javascript, Jones and Bartlet Learning, 2019
2. Dave W Mercer, Allan Kent, Steven D Nowicki, David Mercer, Dan Squier, Wankyu Choi-“Beginning PHP”, Wiley Publishing, Inc.

### Books for Reference

1. Jennifer Niderst Robbins, Learning Web Design, O'REILLY, 2018
2. Frank M. Kromann, Beginning PHP and MySQL: From novice to professional, Fifth Edition, APRESS 2018
3. David R. Brooks, Programming in HTML and PHP, Springer 2017

### Web References

1. Internet Technology, <https://nptel.ac.in/courses/106/105/106105084/>
2. Programming with CSS and Javascript, <https://www.w3schools.com/>
3. PHP Programming with MySQL, <https://swayam.gov.in/nd2/aic20/sp32/>

### Teaching Methods

- Lectures
- Group Discussion
- Assignment and Tutorials
- Visual aids

### Course Outcomes:

On successful completion of the course students will be able to

- CO1:** Understand the concept of web pages and hyperlinked web documents (K2)
- CO2:** Explore various design patterns and to apply styles to static web documents (K3)
- CO3:** Incorporate external scripts and functional attributes to static web pages (K4)
- CO4:** Incorporate PHP scripts to static web pages (K4)
- CO5:** Develop dynamic web pages and with database connectivity (K5)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

### Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	3	2	2	1	1	3	3	-	-	2	2	1	-	20

CO2	2	2	2	1	1	3	3	-	-	2	2	2	-	20
CO3	3	2	2	2	2	3	3	-	-	2	2	2	-	23
CO4	3	3	2	2	2	3	3	-	-	2	2	2	-	24
CO5	3	2	2	2	2	3	3	-	-	2	2	2	-	23
Grand Total of COs with POs PSOs													110	
<b>Grand total with PSOs and POs</b> <b>MV of COs with PSOs and POs = _____ = ( 110/50)</b> <b>No. of COs relating with PSOs &amp; POs</b>													<b>2.2</b>	

Strong – 3, Medium – 2, Low – 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.2
Observation	COs of web Programming is strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS) – KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**LINUX AND SHELL PROGRAMMING**

Class	: BCA	Part	: III Core-9
Semester	: IV	Hours	: 60
Subject Code	: 23UBCC94	Credits	: 03

**Objectives:**

The course enables the students to

- Understand the basic LINUX commands
- Gain knowledge on writing the shell programs
- Explore the ways of accessing the file commands
- Get exposure to work with series of applications, directories, and files
- Get exposure on inter process communication by using LINUX

**(12 Hours)**

**Unit – I Introduction to Linux and Linux Utilities:** A brief history of LINUX, architecture of LINUX, features of LINUX, introduction to vi editor. Linux commands- PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin. Text Processing utilities and backup utilities, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio

**(12 Hours)**

**Unit - II Introduction to Shells:** Linux Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization. Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count Characters, Words or Lines, Comparing Files. Department of Computer Science and Engineering MLR Institute of Technology- UG - Autonomous-Regulations & Syllabus – MLR –

**(12 Hours)**

**Unit - III Grep:** Operation, grep Family, Searching for File Content. UNIX FILE STRUCTURE: Introduction to UNIX file system, inode (Index Node), file descriptors, system calls and device drivers. File Management :File Structures, System Calls for File Management – create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

**(12 Hours)**

**Unit - IV Process and Signals:** Process, process identifiers, process structure: process table, viewing processes, system processes, process scheduling, starting new processes: waiting for a process, zombie processes, orphan process, fork, vfork, exit, wait, waitpid, exec, signals functions, unreliable signals, interrupted system calls, kill, raise, alarm, pause, abort, system, sleep functions, signal sets. File locking: creating lock files, locking regions, use of read and write with locking, competing locks, other lock commands, deadlocks.

**(12 Hours)**

**Unit - V Inter Process Communication:** Pipe, process pipes, the pipe call, parent and child processes, and named pipes: fifos, semaphores: semget, semop, semctl, message queues:

msgget, msgsnd, msgrcv, msgctl, shared memory: shmget, shmat, shmdt, shmctl, ipc status commands. Introduction to Sockets: Socket, socket connections - socket attributes, socket addresses, socket, connect, bind, listen, accept, socket communications.

**Text Books:**

1. W. Richard. Stevens (2005), Advanced Programming in the UNIX Environment, 3rd edition, Pearson Education, New Delhi, India.
2. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg. Thomson

**References:**

1. Linux System Programming, Robert Love, O’Reilly, SPD.
2. Advanced Programming in the UNIX environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. UNIX Network Programming, W.R. Stevens, PHI. UNIX for Programmers and Users, 3rd Edition, Graham Glass, King Ables, Pearson Education

**Web References:**

1. <https://www.guru99.com/introduction-linux.html>
2. <https://homepages.uc.edu/~thomam/Intro Unix Text/Shell Prog.html>
3. [https://www.bogotobogo.com/Linux/linux\\_process\\_and\\_signals.php](https://www.bogotobogo.com/Linux/linux_process_and_signals.php)
4. <https://www.geeksforgeeks.org/inter-process-communication-ipc/>

**Course Outcomes:**

- Ability to use various Linux commands that are used to manipulate system operations at admin level and a prerequisite to pursue job as a Network administrator.
- Ability to write Shell Programming using Linux commands.
- Ability to design and write application to manipulate internal kernel level Linux File System.
- Ability to develop IPC-API’s that can be used to control various processes for synchronization.
- Ability to develop Network Programming that allows applications to make efficient use of resources available on different machines in a network.

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	3	3	3	-	3	3	3	3	3	30
CO2	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO3	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO4	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO5	3	3	-	-	3	3	3	-	3	3	3	3	3	30

<b>Grand total of COs with PSOs and POs</b>	<b>147</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(147/50)</b>	<b>2.94</b>

Strong -3, Medium -2, Low -1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.94
Observation	COs of Linux And Shell Programming– Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

COMPUTER NETWORKS

Class : BCA

Part : III Core-10

Semester : IV

Hours : 60

Subject Code: 23UBCD01

Credits : 04

**Objectives:**

The course enables the students to

- Understand the basic definitions and types of Computer Networks
- Identify different types of Transmission Media.
- Find the mechanism for error detection and correction techniques.
- Expose routing algorithms and its execution process.
- Analyses the implementations of Domain Name System.

**Unit I**

**12 Hours**

**Introduction:** Definition – Types of Networks – Types of Topologies - Networking Software & Hardware - Protocol Hierarchies – Connection oriented and connectionless service. **Reference Models:** OSI Reference Model - TCP/IP Reference Model – Comparison of OSI and TCP/IP Reference Model.

**Unit II**

**12 Hours**

**Physical Layer:** Guided Transmission Media - Magnetic Media – Twisted Pair – Co-axial cable – Fiber Optics. **Wireless Transmission:** Electromagnetic spectrum – Radio Transmission – Microwave Transmission – Infrared - Light Waves. **Communication Satellite:** Geo Stationary, Medium- Earth Orbit, Low Earth Orbit Satellites.

**Unit III**

**12 Hours**

**Data Link Layer:** Error Detection and Correction methods. **Access Control Sub Layer:** Multiple Access Protocols – Ethernet – Wireless LANs – Bluetooth.

**Unit IV**

**12 Hours**

**Network Layer:** Routing Algorithm – Congestion Control Algorithm. **Transport Layer:** Elements of Transport Protocols - Internet Transport Protocols.

**Unit V**

**Application Layer:** DNS – E-mail – FTP – TELNET – HTTP.

**12 Hours**

**Book for Study**

1. Andrew S. Tanenbaum and Wetherall J. David, *Computer Networks*, 5<sup>th</sup> Edition, 2013, PHI.

**Books for Reference:**

1. Achyut S Godbole, *Data Communications and Networks*, 2<sup>nd</sup> Edition, 2011, TMH.
2. Black Uyless, *Computer Networks Protocols, Standard, Interfaces*, 2<sup>nd</sup> Edition, 1993, PHI.

## Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Quiz Programming
- Video Tutorials

## Web References:

1. [https://www.vssut.ac.in/lecture\\_notes/lecture1428550521.pdf](https://www.vssut.ac.in/lecture_notes/lecture1428550521.pdf)
2. <https://www.geeksforgeeks.org/last-minute-notes-computer-network/>
3. <https://www.tutorialsduniya.com/notes/computer-networks-notes/>

## Course Outcomes:

On Successful completion of the course the students able to

**CO1:** Understand the basic concepts and definitions of computer networks. (K2)

**CO2:** Familiarize various transmission mediums (K2)

**CO3:** Understand the mechanism for error detection and correction techniques (K3)

**CO4:** Implement suitable routing and congestion control algorithms. (K4)

**CO5:** Analyze and Execute Domain Name System in real environments. (K4)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

## Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
<b>CO1</b>	3	3	-	-	3	2	2	-	3	2	2	1	2	<b>23</b>
<b>CO2</b>	3	2	-	-	2	1	2	-	2	1	1	1	1	<b>16</b>
<b>CO3</b>	3	2	-	-	2	1	2	-	1	1	2	1	1	<b>16</b>
<b>CO4</b>	3	2	-	-	2	2	2	-	2	1	2	1	1	<b>18</b>
<b>CO5</b>	3	2	-	-	1	-	1	-	1	-	-	1	1	<b>10</b>
<b>Grand total of COs with PSOs and POs</b>														<b>83</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(83/47)</b>														<b>1.77</b>

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.77	
Observation	COs of Computer Networks – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : BCA

Part III : Core Lab-4

Semester : IV

Hours : 75

Subject Code: 23UBCP44

Credits : 03

**WEB PROGRAMMING LAB**

**Objectives:**

The course enables the students to

- Practice HTML elements for creating static web pages
- Practice CSS styles and attributes to incorporate in static web page design
- Develop scripts and functions to be incorporated with html documents
- Develop simple interactive forms and pre-processors to be incorporated in web documents
- Develop dynamic web pages and portals by using database objects

**Lab Exercises**

1. Create static web page (home page) for a reputed educational Institution
2. Design web pages for a business organization and integrate all pages using hyperlinks
3. Design a simple course registration form pattern and display profile summary of the form
4. Design a simple application form by using HTML and java scripts
5. Design a simple static page to display animated images or text within bounded area
6. Design simple login form and display error message on the usage of wrong credential used
7. Design simple arithmetic calculator interface with necessary functionality by using java script
8. Design an online invitation with necessary GUI widgets and containers.
9. Develop PHP script to display simple online feedback form with 5-point metrics
10. Develop PHP script to create CSV file on submission of a typical registration form
11. Develop PHP script to upload a document to a specified location and path
12. Create login form of a typical web portal by using database connectivity
13. Create web application to display all the records of existing database
14. Create web application to search for a specified record on the existing database
15. Create web application to delete a record on the existing database

**Teaching Methods**

- Hands on Training
- Visual Demonstration

**Course Outcome (CO)**

On successful completion of the course students will be able to

**CO1:** Understand HTML tags and their attributes (K2)

**CO2:** Explore the ways to incorporate CSS files into HTML document (K3)

**CO3:** Apply constructs and primitives of java script for creating web pages (K3)

**CO4:** Develop forms and user interfaces for online data processing (K4)

**CO5:** Develop interactive web pages and web portals by using connectors and APIs (K6)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

**Mapping**

<b>Objectives</b>	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	<b>Sum of COs with PSOs &amp; POs</b>
<b>Outcome</b>														
CO1	3	2	1	2	1	3	3	-	-	1	2	2	-	20
CO2	3	2	2	2	1	3	2	-	-	2	2	2	-	21
CO3	3	2	2	1	2	3	2	-	-	2	3	2	-	22
CO4	3	2	2	1	2	3	2	-	-	2	3	2	-	22
CO5	3	2	2	1	2	3	3	-	-	2	2	3	-	23
														108
	<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(108/50)</b>													2.16

Strong – 3, Medium – 2, Low – 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.16
Observation	COs of this course is strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**OPERATIONS RESEARCH**

Class	: B. Sc. (Comp. Sci.)	Part	: III Allied - 4
Semester	: IV	Hours	: 45 Hours
Subject Code	: 23UBCA44	Credits	: 02

**Objectives:**

The course enables the students to

- Apply the Linear programming concepts.
- Analyze various Transportation problems.
- Solve mathematical formulation of assignment models.
- Analyze solutions for various Critical Path methods.
- Evaluate Queuing models.

**Unit I** **9 Hours**

Linear Programming Models: Mathematical formulation – graphical Solution of linear programming models –Simplex Method-Artificial Variable Techniques-Variants of Simplex method

**Unit II** **9 Hours**

Transportation and Mathematical formulation of transportation problem - methods for finding initial basic feasible solution – optimum solution - degeneracy.

**Unit III** **9 Hours**

Mathematical formulation of assignment models –Hungarian Algorithm-Variants of the Assignment problems - Integer Programming Models formulation.

**Unit IV** **9 Hours**

Scheduling by PERT and CPM Network Construction – Critical Path Method – Project Evaluation and Review Technique-Resource Analysis in Network Scheduling

**Unit V** **9 Hours**

Queuing Models: Characteristics of Queuing Models - Poison Queues-(M/M/C):(FIFO/),(M/M/C): (FIFO/),(M/M/1):(FIFO/):(M/M/2):(FIFO/) models.

**Book for Study**

1. Taha H.A, *Operations Research: An Introduction*, Seventh Edition, 2004, Pearson Education.

**Books for Reference**

1. Natrajan A.M, Balasubramani.P, Tamilarasi. A, *Operations Research*, 2005, Person Education.
2. Rath Rani Rina, *Operations Research*, 2019, First Edition.

**Web Reference**

1. Linear Programming Models

<https://www.cuemath.com/algebra/linear-programming/>

2. Transportation problems

<https://www.geeksforgeeks.org/transportation-problem-set-1-introduction/>

3. Hungarian algorithm

[https://www.brainkart.com/article/Solution-of-assignment-problems-\(Hungarian-Method\)\\_39044/](https://www.brainkart.com/article/Solution-of-assignment-problems-(Hungarian-Method)_39044/)

4. PERT and CPM

<https://www.britannica.com/topic/research-and-development/PERT-and-CPM>

5. Introduction to Operation Research: <https://nptel.ac.in/courses/110106062>

#### Teaching Methods:

- Lecturing
- PPTs and PDF
- Video Tutorials

#### Course Outcomes:

On the successful completion of the course students will be able to:

**CO1:** Apply various linear programming concepts. (K5)

**CO2:** Apply methods to get feasible solution. (K3)

**CO3:** Analyze various formats of Assignment problems. (K4)

**CO4:** Evaluate Critical Path. (K5)

**CO5:** Understand queuing process. (K2)

**K1=Remember K2=Understand K3=Apply K4=Analyze K5=Evaluate K6=Create**

#### Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
<b>CO1</b>	2	2	-	-	3	3	3	2	2	3	1	3	-	24
<b>CO2</b>	2	3	-	-	3	3	3	3	2	3	1	3	-	26
<b>CO3</b>	1	2	-	-	2	2	2	1	2	3	1	2	-	18
<b>CO4</b>	2	3	-	-	3	3	3	3	2	3	1	3	-	26
<b>CO5</b>	2	2	-	-	3	2	2	2	2	2	1	2	-	20
<b>Grand total of COs with PSOs and POs</b>														<b>114</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(114/50)</b>														<b>2.28</b>

**Strong -3, Medium -2, Low -1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and Pos			2.28
Observation	COs of Operation Research – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.**

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: II U.G.</b>	<b>Part IV</b>	<b>: NME-2 (Sci_Students)</b>
<b>Semester</b>	<b>: IV</b>	<b>Hours</b>	<b>: 45</b>
<b>Subject code</b>	<b>: 23UBCN24</b>	<b>Credit</b>	<b>: 02</b>

**WEB DESIGNING**

**Objectives :**

The course enables the students to

- Understand the basic HTML tags to create attractive web pages.
- Understand the web page link , create table and frames tags
- Understand the techniques for various transformation of images
- Apply various effects and making color correction with the scanned images.
- Develop simple animation in Flash environment.

**Unit I HTML**

**(9 Hours)**

Introduction to HTML – title – document tags – fonts – background - heading level tags - creating paragraph and line break – Editing & Formatting.

**Unit II**

**(9 Hours)**

Creating hypertext link and list – using Inline images – relative URL – horizontal ruler - Tables - Rows – Columns – Cell columns – Centering table. – Frames – Creating two row frames – forms - Image map.

**Unit III PHOTOSHOP**

**(9 Hours)**

Introduction – images basics – file formats – GIF, JPEG, PNG, PSG - color palette – layers – creating new images – brushes – grids and guides – scaling and positioning images – moving and merging layers – tool palette – screen capturing – grey styling – animation.

**Unit IV**

**(9 Hours)**

Scanning images – Adding text to the images – designing icons – creating background images – color models – color depths – color calibration – creating gradients – oil paint effect.

**Unit V FLASH**

**(9 Hours)**

Introduction to Flash – working with layers – working with movies – drawing tools – color selection – symbols – Flash buttons – Flash menu –smart clip – interactivity with action script – frame actions and the time line – exporting animation – application in Flash – Image map.

**Books for Study:**

1. Richard Schrand, "Photoshop 6 visual Jumpstart", 2000, Adobe Press (Unit I, II&III).
2. James L. Mohles, "Flash 5.0 Graphics, Animation & Interaction", 2000, Macromedia, World Press (Unit IV & V).

### Books for Reference:

1. Deitel , “Internet and World Wide Web How to Program”, Edition 3, 2003, Prentice Hall
2. Robert Reinhardt, Jon Warren Lentz, “Flash 5 Bible” , 2001, Hungry Minds Inc.
3. Meenakshi GM, Web Graphics, 2007, SCITECH Publication.

### Web References:

1. <https://www.geeksforgeeks.org/html-introduction/>
2. <https://www.educba.com/adobe-photoshop-tools>
3. <https://www.photoshopesentials.com/basics>
4. <https://www.instructables.com/Flash-Animation-Basics>
5. <https://ncert.nic.in/textbook/pdf/kect201.pdf>

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video Tutorials

### Course Outcome (CO)

On Successful completion of the course the students able to

**CO1:** Understanding the HTML concepts. (K2)

**CO2:** Create static web pages including links and frames. (K6)

**CO3:** Analyze to work on image files using various Photoshop tools. (K4)

**CO4:** Apply various color effect for image manipulation (K3).

**CO5:** Familiar with several tools in flash and understand the timeline motion to produce Animation. (K2)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

### Mapping Course outcome with

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>-</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>22</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>-</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>22</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>22</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>22</b>
<b>CO5</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>18</b>

<b>Grand total of COs with PSOs and Pos</b>	<b>106</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(106/50)</b>	<b>2.12</b>

Strong – 3, Medium – 2, Low – 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.12
Observation	COs of Web Designing – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514**

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Computer Application in Business**

**Class : BCA**

**Semester : IV**

**Subject Code : 22UBCSL4**

**Part III: Self learning course**

**Hours :**

**Credits: 03**

**Objectives:**

The course enables the student to

- Know about the computer Hardware and Software
- Understand the basics of internet
- Identify the Font, Paragraph and Page Formatting options.
- Understand the basics of MS-Excel.
- Learn to Design the attractive PowerPoint presentation

**UNIT I : BASICS OF COMPUTER**

Characteristics of a Computer; Advantages of Computers; Limitation of Computers; Types of Computers; Applications of computers, Hardware, Firmware, Live-ware; Software; System Software: Operating system, Translators, interpreter, compiler; Overview of operating system, function of operating system; Application software: General Purpose Packaged Software and tailor-made software.

**UNIT II: INTERNET**

Meaning of Internet; Growth of internet, Owner of Internet, Anatomy of Internet, Net Etiquette ; World WideWeb; Internet Protocols, Usage of Internet to society, Search Engines.

**UNIT III: WORD PROCESSING**

Introduction to word Processing; Word processing concepts, Working with word document, Opening an existing document/creating a new document; Saving, Selecting text, Editing text, Finding and replacing text, Formatting text, Bullets and numbering, Tabs, Paragraph Formatting, Page Setup

**UNIT IV: SPREAD SHEET**

Spreadsheet concepts; Creating a work book, saving a work book, editing a work book, inserting, deleting work sheets, entering data in a cell, formula Copying, Moving data from selected cells, Handling operators in formulae: Inserting Charts-LINE, PIE, BAR, Mathematical- ROUND ALL, SUM, SUMIF, COUNT, COUNTIF ; Statistical – AVERAGE, MAX, MIN, STDEV, FREQUENCY, INTERCEPT, SLOPE.; Financial - PMT, PPMT, IPMT; Logical - IF, AND, OR

**UNIT V: PRESENTING SOFTWARE**

Introduction to PowerPoint -**Home Menu**-Slide-Font-Paragraph. **Insert Menu**: Tables-Illustrations-Links-Text-Media clips. **Design Menu**: Pagesetup-Themes- Background .**Animation**-Custom Animation-Transition.

## Books for References

1. Sanjay Saxena, A First Course in Computers, Vikas Publishing House, New Delhi
2. Pradeep K. Sinha and Preeti Sinha, Foundation of Computing, , BPB, Publication.
3. Deepak Bharihoka, Fundamentals of Information Technology, Excel Book, New Delhi
4. V. Rajaraman, Introduction to Information Technology, PHI. New Delhi
5. R. Hunt, J. Shelley, Computers and Commonsense, Prentice Hall of India New Delhi
6. Leon, M. Leon, Fundamentals of Information Technology, Leon Vikas, (4)  
Softwaremanuals

## Teaching Methods

- Lecturing
- PPT's
- Learning by Doing

## Course Outcome (CO):

On successful completion of the course the students able to

**CO1:** Understand the computer peripherals and software. (K2)

**CO2:** Able to understand internet technologies. (K2)

**CO3:** Work with the basic features of MS-Word. (K3)

**CO4:** Exercise to apply Spreadsheet functions. (K3)

**CO5:** Design the PowerPoint and apply the animation. (K3)

K1=Remember, K2= Understand, K3 = Apply, K4 =Analyze, K5 =Evaluate, K6 = Create

## Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO2	2	2	2	1	1	3	3	-	-	2	2	2	-	20
CO3	3	2	2	2	2	3	3	-	-	2	2	2	-	23
CO4	3	3	2	2	2	3	3	-	-	2	2	2	-	24
CO5	3	2	2	2	2	3	3	-	-	2	2	2	-	23
Grand Total of COs with POs PSOs														110
Grand total with PSOs and POs														
Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}} = (110/50)$														2.20

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.20
Observation	COs of Computer Applications in Business – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR, MADURAI.**

**Department of Computer Science & Applications**

**PG Course Structure**

**(Those who join in 2023-24 onwards)**

**Semester-I**

<b>Course Components</b>	<b>Subject Code</b>	<b>Name of the Course</b>	<b>Credits</b>	<b>Hours</b>
Part III	23PCAC11	Core: 1 Mathematical Foundations of Computer Science	5	6
	23PCAC21	Core: 2 Python Programming	4	5
	23PCAC31	Core: 3 Relational Database Management System	4	5
	23PCAE11	Elective 1: Operating System	3	4
	23PCAP11	Core Lab 1: Data Engineering and Management - Practical	3	5
	23PCAP21	Core Lab 2 :Python Programming - Practical	3	5
<b>Total</b>			<b>22</b>	<b>30</b>

**Semester-II**

<b>Course Components</b>	<b>Subject Code</b>	<b>Name of the Course</b>	<b>Credits</b>	<b>Hours</b>
Part III	23PCAC42	Core 4: Data Structures and Algorithms	5	6
	23PCAC52	Core 5: Web Technologies	4	5
	23PCAC62	Core 6: Data Communication & Networking	4	5
	23PCAE22	Elective 2: Data Mining & Warehousing	3	4
	23PCAP32	Core Lab 3 : Data Structures and Algorithms – Practical	3	5
	23PCAP42	Core Lab 4 : Web Technologies -Practical	3	5
<b>Total</b>			<b>22</b>	<b>30</b>

### Semester-III

Course Components	Subject Code	Name of the Course	Credits	Hours
Part III	23PCAC73	Core 7: Advanced Java Programming	5	6
	23PCAC83	Core 8: Mobile Application Development	4	5
	23PCAC93	Core 9: Big Data Analytics	4	5
	23PCAE33	Elective 3: Cyber Security	3	4
	23PCAP53	Core Lab 5: Advanced Java Programming – Practical	4	5
	23PCAP63	Core Lab 6 : Mobile Application Development – Practical	3	5
	23PINT13	Internship/ Industrial activity	2	-
<b>Total</b>			<b>25</b>	<b>30</b>

### Semester-IV

Course Components	Subject Code	Name of the Course	Credits	Hours
Part III	23PCAD04	Core: 10 Industry Dynamics Technology- R Programming	4	6
	23PCAD14	Core: 11 Machine Learning	4	6
	23PCAD24	Core 12: Advanced Software Engineering	4	6
	23PCAD34	Core 13 : (Professional Competency Skill) Professional Ethics	1	2
	23PCAD44	Project	7	5
	23PCAP74	Core Lab 7 : Machine Learning - Practical	3	5
<b>Total Credit</b>			<b>23</b>	<b>30</b>

**Total Credit: 92**

#### Credits for each Semester

Semester	I	II	III	IV	Total
Credits	22	22	25	23	92

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: MCA</b>	<b>Part</b>	<b>: Core - 1</b>
<b>Semester</b>	<b>: I</b>	<b>Hours</b>	<b>: 90</b>
<b>Subject Code</b>	<b>: 23PCAC11</b>	<b>Credit</b>	<b>: 5</b>

**MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE**

**OBJECTIVES:**

The course enables the students to

- Understand the Mathematical logics and Predicate Calculus
- Analyze critically about set theory and their relations
- Interpret the fundamentals of Groups
- Understand the Graph and its Representations
- Understand the basics of language and its Grammar

**UNIT I** **(18 hours)**

Mathematical logic – Statements – Negation – Conjunction – Disjunction – Statement formulae and truth tables – Conditional and Bi-conditional - Well formed formulas – Tautologies – contradictions-Boolean Algebra-Basic Operations-Boolean functions-De-Morgan's Theorem-Logic Gates-sum of Product-Canonical form-simplifications-K-map.

**UNIT II** **(18 hours)**

Basic concepts of set theory: Notation – sub set-operations on set-algebra on set-venn diagram-collection of sets-multiset-countable and uncountable sets-ordered pairs and Cartesian product-computer representation sets-fuzzy sets.

**UNIT III** **(18 hours)**

Groups: Definition and examples – Sub groups – Homomorphism and Isomorphism Groups-cyclic group-permutation group.

**UNIT IV** **(18 hours)**

Graph theory: Basic Definitions-simple graph ,multigraph and pseudograph-Degree of a vertex-Types of Graphs-operations on graphs-paths,cycles and connectivity-Eulerian and Hamiltonian Graph-Shortest path problem

**UNIT V** **(18 hours)**

Trees and their properties-Spanning Trees-Binary Tree-Tree Traversal-Grammars and languages: Introduction-String-Languages-Regular Expressions-Grammars-Finite State Machines-finite State Automata-Moore and Mealey Machine-Pushdown Automata-Turing Machine.

**BOOKS FOR STUDY**

Dr.Swapan Kumar Sharma, Discrete Mathematics, S.Chand Publications, 2017.

**BOOKS FOR REFERENCE**

1. Kolman Bernard, Robert C.Busby, *Discrete Mathematical Structures for Computer Science*, Second Edition PHI, 2014.
2. Hopcroft, Joseph E. Ullman, Jeffery D, *Introduction to Automata Theory Languages and Computations*, Narosa Publishing House, New Delhi, 2014.
3. Levin Oscar, *Discrete Mathematics An Open Introduction*, Third Edition, 2013.

## TEACHING METHODS

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

## COURSE OUTCOMES:

On the successful completion of course students will be able to

**CO1:** Solve the problems using truth table technique, rules of inference method.(K3)

**CO2:** Apply the concepts of Set theory and Relation in real life problem (K3)

**CO3:** Demonstrate the basics of groups and sub groups.(K2)

**CO4:** Apply the Graph theory concepts in Computer Network and Computer Graphics.(K3)

**CO5:** Understand the concepts of Grammar and languages.(K2)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

## MAPPING COURSE OUTCOME WITH POs AND PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	2	2	2	2	2	1	-	-	2	1	-	2	3	19
CO2	3	2	2	2	2	1	-	-	2	1	-	2	3	20
CO3	2	3	1	3	2	1	-	-	1	-	-	1	2	16
CO4	3	2	2	1	2	1	-	-	2	3	-	2	3	21
CO5	2	3	3	-	1	1	-	-	1	1	-	2	2	16
<b>Grand total of COs with PSOs and POs</b>														<b>106</b>
<b>Grand total with PSOs and POs</b>														
Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (106/ 48)														<b>2.20</b>

Strong – 3, Medium -2, Low - 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.20
Observation	COs of Mathematical Foundation of Computer Science – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR  
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: MCA</b>	<b>Part</b>	<b>: Core-2</b>
<b>Semester</b>	<b>: I</b>	<b>Hours</b>	<b>: 75</b>
<b>Subject Code</b>	<b>: 23PCAC21</b>	<b>Credit</b>	<b>: 4</b>

**PYTHON PROGRAMMING**

**OBJECTIVES:**

The course enables the students to

- Understand the basic features of Python
- Develop Python programs with conditionals and loops and data structures
- Build composite data types in Python
- Design and write efficient application using OOPs concepts
- Design and program Python applications with database.

**UNIT- I: INTRODUCTION TO PYTHON (15 Hours)**

Overview – History of Python – Python features - Installing Python-Basics Syntax-VariablesAssignments-Immutable variables-Numerical types-Arithmetic Operators-Expressions - Comments in the Program-Understanding the error Messages - DATA, EXPRESSIONS, STATEMENTS: Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments

**UNIT II: CONTROL FLOW, FUNCTIONS, STRINGS (15 Hours)**

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Strings: A String Is a Sequence, Traversal with a for Loop, String Slices, Strings Are Immutable, Searching, Looping and Counting, String Methods, The in Operator, String Comparison, String Operations

**UNIT- III: LISTS, TUPLES, DICTIONARIES, FILES (15 Hours)**

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing – list comprehension - Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions

**UNIT IV: REGULAR EXPRESSIONS, OOP (15 Hours)**

Regular Expressions – Concept of regular expression, various types of regular expressions, using match function. Classes and Objects: Overview of OOP (Object Oriented Programming), Class Definition, Creating Objects, Instances as Arguments, Instances as return values, Built-in Class Attributes, Inheritance, Method Overriding, Data Encapsulation, Data Hiding

**UNIT V: GUI PROGRAMMING****(15 Hours)**

Widgets: Button, Canvas, Checkbutton, Entry, Frame, Label, Listbox, Menubutton, Menu, Message, Radiobutton, Scale, Scrollbar, text, Toplevel, Spinbox, PanedWindow, LabelFrame, MessageBox. Handling Standard attributes and Properties of Widgets - Connecting to a MySQL database from Python, Configuring the MySQL connection, Designing the Python GUI database, Using the INSERT command, Using the UPDATE command, Using the DELETE command, Storing and retrieving data from MySQL database.

**BOOKS FOR STUDY**

1. Downey Allen. B, *Think Python: How to Think Like a Computer Scientist*, Second Edition, O'Reilly Publishers, 2016,
2. Rossum Van Guido, Jr Drake Fred. L, *An Introduction to Python Revised and updated for Python 3.2*, Network Theory Ltd., 2011.
3. Goldwasser Michael. Letscher H, David, *Object-oriented Programming in Python*, Pearson Prentice Hall, 2008

**BOOKS FOR REFERENCE**

1. Dierbach Charles, *Introduction to Computer Science using Python: A Computational Problem- Solving Focus*, Wiley India Edition, 2013
2. Guttag John. V, *Introduction to Computation and Programming Using Python*, Revised and expanded Edition, MIT Press, 2013
3. Budd Timothy A, *Exploring Python*, Mc-Graw Hill Education (India) Private Ltd, 2015

**COURSE OUTCOMES**

On the successful completion of the course the students will able to

**CO1:** Develop simple Python programs for solving problems.(K3)

**CO2:** Write simple Python programs and decompose a Python program into functions.(K2)

**CO3:** Understand compound data and read and write data from/to files in Python Programs. (K3)

**CO4:** Develop programming using OOPs concepts in python. (K3)

**CO5:** Create the GUI Form and Adding Widgets and design GUI database. (K6)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

**MAPPING COURSE OUTCOME WITH POs AND PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
<b>CO1</b>	3	3	2	3	2	2	-	-	3	3	-	3	3	<b>27</b>
<b>CO2</b>	3	2	2	2	2	3	-	-	3	2	-	3	3	<b>25</b>
<b>CO3</b>	3	2	3	3	2	3	-	-	3	2	-	3	3	<b>27</b>
<b>CO4</b>	3	2	3	3	2	3	-	-	3	2	-	3	3	<b>27</b>
<b>CO5</b>	3	2	3	3	2	3	-	-	3	2	-	3	3	<b>27</b>
<b>Grand total of COs with PSOs and POs</b>														<b>133</b>
<b>Grand total with PSOs and POs</b>														
Mean value of COs with PSO and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ (133/50)														<b>2.66</b>

Strong – 3, Medium -2, Low – 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.66
Observation	COs of Python Programming– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

<b>Class</b>	<b>: MCA</b>	<b>Part</b>	<b>: Core - 3</b>
<b>Semester</b>	<b>: I</b>	<b>Hours</b>	<b>: 75</b>
<b>Subject Code</b>	<b>: 23PCAC31</b>	<b>Credit</b>	<b>: 4</b>

**RELATIONAL DATABASE MANAGEMENT SYSTEM**

**Objectives:**

The course enables the students to

- Understand the fundamentals of data models and conceptualize database system and ER diagram.
- Recognize the SQL and relational database design.
- Understand the data storage techniques.
- Familiar with about query processing techniques
- Know about the knowledge in transaction processing, concurrency control techniques and recovery procedures.

**UNIT I** **(15 Hours)**

Database Systems -View of Data- Data Models-Database Languages-Transaction Management-Database Systems Structure-History of Database Systems-Database Systems Applications-Entity Relationship Model

**UNIT II** **(15 Hours)**

SQL-Basic Structure-Set Operations-Complex Queries-Joined Queries-DDL-Embedded SQL-Other SQL Functions-Query by Example-Integrity and Security of searching-Relational Database Design

**UNIT III** **(15 Hours)**

Storage And File Structure-Disks-RAID-File Organization-Indexing And Hashing-B+ TREE-B Tree-Static Hashing-Dynamic Hashing-Multiple Key Access

**UNIT IV** **(15 Hours)**

Query Processing- Selection Operation- Sorting-Join Operation- Evaluation of Expressions-Query Optimization

**UNIT V** **(15 Hours)**

Transaction Concept-Static Implementation-Concurrency Control-Protocols-Deadlock Handling-Recovery Systems-Recovery with Concurrent Transactions

**BOOK FOR STUDY**

1. Silberschatz [Abraham](#), Korth [Henry F.](#), [Sudarshan](#). S, *Database System Concepts*, 7<sup>th</sup> Edition, Tata McGraw Hill Publications, 2019

**BOOKS FOR REFERENCE**

1. RamakrishnanRaghu, GehrkeJohannes, *Data Base Management Systems*, Third Edition McGraw Hill International, New Delhi, 2014
2. Koch George, LoneyKelvin, *Oracle8 – The Complete Reference*, Tenth Edition, Tata McGraw., New Delhi, 2000
3. Date C.J, *An Introduction to Database Systems*, Third Edition, Narosa Publishing House, 2012

## TEACHING METHODS

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

## COURSE OUTCOMES

On the successful completion of the course the students will able to

CO1: Understand the basic concepts of the database and data models (K2)

CO2: Apply the knowledge on the effective use of queries (K3)

CO3: Apply the storage techniques for the effective use of memory (K3)

CO4: Apply the query processing and optimization techniques (K3)

CO5: Apply the concurrency and recovery techniques (K3)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

## MAPPING COURSE OUTCOMES WITH PO AND PSO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	2	2	1	2	2	-	-	2	1	1	3	2	21
CO2	3	3	3	3	2	2	-	-	3	2	1	3	3	28
CO3	3	3	3	2	2	2	-	-	3	-	-	3	2	24
CO4	3	3	2	3	2	3	-	-	3	-	-	3	3	25
CO5	3	3	2	3	2	3	-	-	3	2	-	3	2	27
<b>Grand total of COs with PSOs and POs</b>														<b>125</b>
<b>Grand total with PSOs and POs</b>														
Mean value of COs with PSOS and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (125 / 52)														<b>2.4</b>

Strong – 3, Medium -2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.4
Observation	COs of Relational Database Management Systems – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : MCA**

**Part : Elective 1**

**Semester : I**

**Hours : 60**

**Subject Code : 23PCAE11**

**Credits: 3**

**OPERATING SYSTEM**

**OBJECTIVES:**

**The course enables the students to**

- Understand the process concepts and its related algorithms.
- Analyze the concept of Deadlock prevention, Avoidance, Detection and Recovery
- Describe about storage management concepts like swapping, paging and Segmentation
- Review the process Management and disk performance optimization
- Understand the Securities applied in various Operating Systems

**UNIT I OPERATING SYSTEMS OVERVIEW (12 Hours)**

Operating system – Types of Computer Systems - Computer-system operation – I/O structure – Hardware Protection - System components – System calls – System programs – System structure - Process concept – Process scheduling – Operations on processes – Cooperating processes – Inter-process communication – Communication in client server systems - Multithreading models – Threading issues.

**UNIT II PROCESS MANAGEMENT (12 Hours)**

Scheduling criteria – Scheduling algorithms – Multiple-processor scheduling – Real time scheduling – Algorithm Evaluation – Process Scheduling Models - The critical-section problem – Synchronization hardware – Semaphores – Classic problems of synchronization – critical regions – Monitors - System model – Deadlock characterization – Methods for handling deadlocks – Recovery from deadlock

**UNIT III STORAGE MANAGEMENT (12 Hours)**

Memory Management – Swapping – Contiguous memory allocation – Paging – Segmentation – Segmentation with paging. Virtual Memory: Background – Demand paging – Process creation – Page replacement – Allocation of frames – Thrashing.

**UNIT IV I/O SYSTEMS (12 Hours)**

File concept – Access methods – Directory structure – Files system mounting – Protection - Directory implementation – Allocation methods – Free-space management - Disk scheduling – Disk management – Swap-space management.

**UNIT V CASE STUDY (12 Hours)**

The Linux System - History – Design Principles – Kernel Modules – Process Management – Scheduling – Memory management – File systems – Input and Output – Inter-process Communication – Network Structure – Security – Windows 7 - History – Design Principles – System Components – Environmental subsystems – File system – Networking

**BOOK FOR STUDY**

1. Silberschatz Abraham, Galvin Peter. B, Gagne Greg, *Operating System Concepts*, Ninth Edition, John Wiley and Sons Inc, 2013.

### BOOKS FOR REFERENCE

1. Tanenbaum Andrew. S, Bos Herbert, *Modern Operating Systems*, Fourth Edition, Pearson PLC, 2014,
2. Nutt Gary, *Operating Systems*, Third Edition, Pearson Education, 2009
3. Deital H M, Deital P J, Choffnes D R, *Operating Systems*, Third Edition, Pearson Education., 2009

### TEACHING METHODS

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### COURSE OUTCOMES

On the successful completion of the course the students will able to:

CO1: Describe the evolution, types, structure and functions of operating systems (K1)

CO2: Understand the concept of Concurrent Programming (K2)

CO3: Understand the techniques involved in Storage Management system (K2)

CO4: Analyze processor scheduling, synchronization, deadlocks and disk allocation algorithms for a given scenario (K4)

CO5: Describe security and protection measures used in operating systems (K2)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### MAPPING COURSE OUTCOME WITH PO AND PSO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	2	1	1	2	-	-	3	1	-	2	2	19
CO2	3	3	2	1	1	2	-	-	3	1	-	2	2	20
CO3	3	3	3	2	1	2	-	-	3	1	-	2	2	31
CO4	3	3	2	2	1	2	-	-	3	1	-	2	2	21
CO5	3	2	2	1	1	2	-	-	3	1	-	2	2	19
<b>Grand total of COs with PSOs and POs</b>														<b>110</b>
<b>Grand total with PSOs and POs</b>														
Mean value of COs with PSO and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (110/50)														<b>2.2</b>

Strong – 3, Medium -2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.2
Observation	COs of Operating System – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : MCA** **Part : Core Lab-1**  
**Semester : I** **Hours : 75**  
**Subject Code : 23PCAP11** **Credit : 3**

**DATA ENGINEERING AND MANAGEMENT-PRACTICAL**

**COURSE OBJECTIVES:**

- To acquire basic scripting knowledge in MongoDB
  - To learn CRUD Operation on MongoDB database
  - To comprehend MongoDB using DbVisualizer
  - To be familiar with Zoho CRM features
  - To customize your application using Zoho CRM
1. Write a script to create a MongoDB database and perform insert operation
  2. Write a MongoDB script to perform query operations
  3. Write a MongoDB Script to perform update operations
  4. Write a MongoDB Script to update documents with aggregation pipeline
  5. Write a MongoDB script to delete single and multiple documents
  6. Write a MongoDB script to perform string aggregation operations
  7. Design a Data Model for MongoDB using DbVisualizer
  8. Perform CRUD operations using DbVisualizer
  9. Create a Zoho CRM account and organize your Tasks, Meetings and Deals
  10. Create and maintain a project using Zoho CRM features

**COURSE OUTCOMES**

On the successful completion of the	Description	Knowledge Level
<b>CO1</b>	Comprehend the scripting knowledge in MongoDB and perform basic operations in shell prompt	<b>K1- K6</b>
<b>CO2</b>	Implement, Create, Read, Update and Delete Operations on MongoDB database	
<b>CO3</b>	Analyze MongoDB using DbVisualizer	
<b>CO4</b>	Assess Zoho CRM features for managing the customer relationships	
<b>CO5</b>	Create a customized application in Zoho CRM	

**K1-' Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create**

**MAPPING COURSE OUTCOME WITH POs AND PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	3	3	2	2	-	-	3	3	-	3	3	28
CO2	3	2	3	3	2	3	-	-	3	2	-	3	3	27
CO3	3	2	2	3	2	3	-	-	3	2	-	3	3	26
CO4	3	2	2	3	2	3	-	-	3	2	-	3	3	26
CO5	3	2	2	3	2	3	-	-	3	2	-	3	3	26
<b>Grand total of COs with PSOs and Pos</b>														<b>131</b>
<b>Grand total with PSOs and POs</b>														
Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}}$ = (131/50)														<b>2.62</b>

**Strong – 3, Medium -2, Low - 1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.62
Observation	COs of Python Programming Lab – Strongly related with PSOs and Pos		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : MCA**

**Part : Core Lab-2**

**Semester : I**

**Hours : 75**

**Subject Code : 23PCAP21**

**Credit : 3**

**PYTHON PROGRAMMING - PRACTICAL**

**OBJECTIVES:**

The course enables the students to

- Understand the basic concepts in Python Data Types and Control Flow
- Develop Python programs with conditionals and loops and data structures
- Build list, tuple, dictionaries
- Develop program using OOPs concepts in Python
- Design and program Python applications with database.

**PROGRAM LIST**

1. Write a program to demonstrate different number data types in Python.
2. Write a program to perform different Arithmetic Operations on numbers in Python.
3. Write a program to create, concatenate and print a string and accessing sub-string from a given string.
4. Write a python script to print the current date in the following format Sun May 29 02:26:23 IST 2017
5. Write a python program to find largest of three numbers.
6. Write a Python program to convert temperatures to and from Celsius, Fahrenheit. [ Formula :  $c/5 = f-32/9$  ]
7. Write a Python program to construct the following pattern, using a nested for loop\*

```
*
* *
* * *
* *
*
```

8. Write a program to create, append, and remove lists in python.
9. Write a Python program to clone or copy a list
10. Write a program to demonstrate working with tuples in python.
11. Write a program to demonstrate working with dictionaries in python.
12. Write a Python script to sort (ascending and descending) a dictionary by value
13. Write a python program to define a module and import a specific function in that module to another program.
14. Write a script named copyfile.py. This script should prompt the user for the names of two text files. The contents of the first file should be input and written to the second file.

15. Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order.
16. Write a Python class to implement  $\text{pow}(x, n)$
17. Write a Python class to reverse a string word by word.
18. Design a simple database application that stores the records and retrieve the same.
19. Design a database application to search the specified record from the database.
20. Design a database application to that allows the user to add, delete and modify the records.

### COURSE OUTCOMES

On the successful completion of the course the students will able to

**CO1:** Write simple Python programs for solving problems.(K3)

**CO2:**Decompose a Python program into functions.(K3)

**CO3:** Manipulate compound data types and files in Python Programs.(K4)

**CO4:** Write programming using OOPs concepts in python.(K3)

**CO5:** Create the Python application for real world problems.(K6)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

### MAPPING COURSE OUTCOME WITH POs AND PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
<b>CO1</b>	3	3	3	3	2	2	-	-	3	3	-	3	3	28
<b>CO2</b>	3	2	3	3	2	3	-	-	3	2	-	3	3	27
<b>CO3</b>	3	2	2	3	2	3	-	-	3	2	-	3	3	26
<b>CO4</b>	3	2	2	3	2	3	-	-	3	2	-	3	3	26
<b>CO5</b>	3	2	2	3	2	3	-	-	3	2	-	3	3	26
<b>Grand total of COs with PSOs and Pos</b>														<b>131</b>
<b>Grand total with PSOs and POs</b>														
Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}}$ = (131/50)														<b>2.62</b>

**Strong – 3, Medium -2, Low – 1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.62
Observation	COs of Python Programming Lab – Strongly related with PSOs and Pos		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : MCA**

**Part : Core -4**

**Semester : II**

**Hours : 90**

**Subject Code : 23PCAC42**

**Credit : 5**

**DATA STRUCTURES AND ALGORITHMS**

**COURSE OBJECTIVES:**

- To get a clear understanding of various ADT structures.
- To understand how to implement different ADT structures with real-time scenarios.
- To analyze the various data structures with their different implementations.
- To get an idea of applying right models based on the problem domain.
- To realize, and understand how and where to implement modern data structures with Python language.

**UNIT-I**

**(18 Hours)**

**Abstract Data Types:** Introduction-Date Abstract Data Type-Bags-Iterators. **Arrays:** Array Structure-Python List-Two Dimensional Arrays-Matrix Abstract Data Type. **Sets, Maps:** Sets-Maps- Multi-Dimensional Arrays.

**UNIT-II**

**(18 Hours)**

**Algorithm Analysis:** Experimental Studies-Seven Functions-Asymptotic Analysis. **Recursion:** Illustrative Examples-Analyzing Recursive Algorithms-Linear Recursion- Binary Recursion-Multiple Recursion.

**UNIT-III**

**(18 Hours)**

**Stacks, Queues, and Deques:** Stacks- Queues- Double-Ended Queues Linked. **Lists:** Singly Linked Lists-Circularly Linked Lists-Doubly Linked Lists. **Trees:** General Trees-Binary Trees-Implementing Trees-Tree Traversal Algorithms.

**Unit-IV**

**(18 Hours)**

**Priority Queues:** Priority Queue Abstract Data Type- Implementing a Priority Queue- Heaps-Sorting with a Priority Queue. **Maps, Hash Tables, and Skip Lists:** Maps and Dictionaries-Hash Tables- Sorted Maps-Skip Lists-Sets, Multisets, and Multimaps.

**UNIT-V**

**(18 Hours)**

**Search Trees:** Binary Search Trees-Balanced Search Trees-AVL Trees-Splay Trees. **Sorting and Selection:** Merge sort-Quick sort-Sorting through an Algorithmic Lens- Comparing Sorting Algorithms-Selection. **Graph Algorithms:** Graphs-Data Structures for Graphs-Graph Traversals-Shortest Paths-Minimum Spanning Trees.

**TEXT BOOK:**

1. Rance D. Necaie, "Data Structures and Algorithms Using Python", John Wiley & Sons, 2011. (Unit – 1) **Chapters:** 1, 2, 3.
2. Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, "Data Structures and Algorithms in Python", John Wiley & Sons, 2013. (Unit – 2, 3, 4, and 5)**Chapters:** 3 to 12, and 14.

**REFERENCE BOOKS:**

1. Dr. Basant Agarwal; Benjamin Baka, "Hands-On Data Structures and Algorithms with Python: Write complex and powerful code using the latest features of Python 3.7", Packt Publishing, 2018.
2. Magnus Lie Hetland, "Python Algorithms: Mastering Basic Algorithms in the Python Language", Apress, 2014.

**COURSE OUTCOME:**

On the successful completion of the course, students will be able to,

CO1	Understand various ADT concepts	K1-K6
CO2	Familiar with implementation of ADT models with Python language and understand how to develop ADT for the various real-time problems	
CO3	Apply with proper ADT models with problem understanding	
CO4	Apply and Analyze right models based on the problem domain	
CO5	Evaluate modern data structures with Python language	

K1- Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 –Create

**MAPPING COURSE OUTCOME WITH POs AND PSOs**

Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of Cos with PSOs& POs
CO1	3	3	2	1	1	3	-	-	3	3	-	3	3	25
CO2	3	3	2	1	2	3	-	-	3	3	-	3	3	26
CO3	3	3	3	1	2	3	-	-	3	3	-	3	3	27
CO4	3	3	3	2	2	3	-	-	3	3	-	3	3	28
CO5	3	3	3	2	2	3	-	-	3	3	-	3	3	28
<b>Grand total of COs with PSOs and Pos</b>														<b>134</b>
<b>Grand total with PSOs and POs</b>														
Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (134 / 50)														<b>2.68</b>

Strong – 3, Medium -2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and Pos			2.68
Observation	COs of Data Structures using C++ – Strongly related with PSOs and Pos		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : MCA**

**Part : Core 5**

**Semester : II**

**Hours : 75**

**Subject Code : 23PCAC52**

**Credit : 4**

**WEB TECHNOLOGIES**

**COURSE OBJECTIVES:**

- Understand the fundamentals of the web and thereby develop web applications using various development languages and tools.
- Enrich knowledge about XHTML control and Cascading Style Sheets.
- Provide in- depth knowledge about Javascript.
- To enhance knowledge in XML documents with presentations using CSS.
- Deliver depth knowledge about PHP, Mysql

**UNIT –I**

**(15 Hours)**

**WEB FUNDAMENTALS AND HTML:** A Brief Introduction to the Internet - The World Wide Web - Web Browsers - Web Servers -URLs, MIME, HTTP, Security- Introduction to HTML- Origins and Evolution of HTML and HTML - Basic Syntax - Standard HTML Document Structure - Basic Text Markup - Images- Hypertext Links - Lists, Tables, Forms, The Audio Element, The Video Element - Organization Elements.

**UNIT – II**

**(15 Hours)**

**INTRODUCTION TO XHTML AND CSS:** Basic syntax, Standard structure, Basic text-markup, Images, Hypertext Links. Lists, Tables, Forms, Frames, syntactic differences between HTML and XHTML-Introduction, Levels of style sheets, Style specification formats, Selector forms, Property value forms, Font properties, List properties, Color, Alignment of text, The box model, Background images, The<span> and <div>tags, Conflict resolution.

**UNIT - III**

**(15 Hours)**

**THE BASICS OF JAVASCRIPT:** Overview of JavaScript, Object orientation and JavaScript, general Syntactic characteristics, Primitives, operations, and expressions, Screen output and keyboard input, Control statements, Object creation and modification, Arrays, Functions, Constructors, Pattern matching using regular expressions, Errors in scripts.

**JAVASCRIPT AND XHTML DOCUMENTS:** The JavaScript Execution Environment, The Document Object Model, Elements Access in Java Script, Events and Event Handling, Handling Events from Body Elements, Handling Events from Text Box and password Elements, The DOM2 Model

**UNIT- IV**

**(15 Hours)**

**XML:** Introduction of XML- Some current applications of XML, Features of XML, Anatomy of XML document, The XML Declaration, Element Tags- Nesting and structure, XML text and

text formatting element, Table element, Mark-up Element and Attributes, Document Type Definition (DTD), types.

**UNIT - V**

**(15 Hours)**

**PHP and MySQL** Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, string, Form processing, Files, Advance Features: Cookies and Sessions, Object Oriented Programming with PHP. Basic commands with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHPMyAdmin and database bugs

**TEXT BOOKS:**

1. HTML5 Black Book: Covers CSS3, JavaScript, XML, XHTML, Ajax, PHP and JQuery, Kogent Learning Solutions 2016.

**REFERENCE BOOKS:**

1. M. Srinivasan: Web Programming Building Internet Applications, 3<sup>rd</sup> Edition, Wiley India, 2009.
2. Jeffrey C. Jackson: Web Technologies-A Computer Science Perspective, Pearson Education, 7<sup>th</sup> Impression, 2012.
3. M.Srinivasan: Web Technology Theory and Practice, 1<sup>st</sup> Edition, Pearson Education, 2012.
4. Raj Kamal: Internet and Web Technologies, 2<sup>nd</sup> Edition, McGraw Hill Education, 2022.

**COURSE OUTCOMES:**

On the successful completion of the course, students will be able

CO1	Design dynamic web pages using Javascript, JQuery and Angular Java script	K1	LO
CO2	Develop Web pages using HTML, CSS and XML	K2	IO
CO3	Create web application using PHP and MySQL	K3, K4	HO
CO4	To design dynamic web pages using Angular javascript	K2,K3	HO
CO5	Develop interactive web pages using JQuery	K4,K5	HO

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : MCA** **Part : Core 6**  
**Semester : II** **Hours : 75**  
**Subject Code : 23PCAC62** **Credit : 4**

**DATA COMMUNICATIONS AND NETWORKING**

**OBJECTIVES:**

The course enables the students to

- Describe the building blocks of Computer Networks
- Analyze Analog and Digital signals and Interfaces
- Describe transmission media and error detection methods
- Understand the functions of protocol and Networking devices
- Understand the concepts of Domain Name System

**UNIT I** **(15 Hours)**

Data communication system components – Network criteria – Protocols and Standards – Basic concepts: line configuration, topology, transmission mode, categories of networks and internetworks – the OSI Reference model – functions of each layer.

**UNIT II** **(15 Hours)**

Signals – Analog signal – Frequency spectrum and bandwidth – Digital signals – decompositions, Bandwidths and data rate – Encoding of analog and digital signals – digital data transmission DTE – DCE interface.

**UNIT III** **(15 Hours)**

Multiplexing - Transmission media - Types of transmission errors –Error Detection and Correction methods – Data link controls and protocols.

**UNIT IV** **(15 Hours)**

Local Area Networks: Ethernet, Token bus, Token ring and FDDI. **MANs:** IEEE 802.6 and SMDS, Switching in network layer- The ISDN services – the X.25 layers - Repeaters, Bridges, Routers and Gateway.

**UNIT V** **(15 Hours)**

The transport layer service – Upper OSI Layers – TCP and UDP- Domain Name System - SMTP – WWW.

**BOOK FOR STUDY**

1. Foruzan Behrouz A, *Data Communications and Networking*, Fourth Edition, Tata McGraw-Hill, 2009

**BOOK FOR REFERENCE**

1. Tanenbaun Andrew. S, *Computers Networks*, Forth Edition, 2009, Pearson Prentice Hall.

**TEACHING METHODS**

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### COURSE OUTCOMES (CO)

On successful completion of the course the students able to

CO1: Understand the building blocks of Computer Networks (K2)

CO2: Understand Analog and Digital Signals and Interfaces (K2)

CO3: Apply appropriate transmission media and error detection methods for applications (K4)

CO4: Analyze the Appropriate Protocols and Networking Devices (K4)

CO5: Execute Knowledge in Domain Name Systems (K3)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

### MAPPING COURSE OUTCOME WITH

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of Cos with PSOs& POs
CO1	2	2	1	1	1	3	-	-	3	2	-	2	3	23
CO2	2	2	2	1	-	3	-	-	3	1	-	3	2	22
CO3	3	2	2	2	1	3	-	-	3	2	-	2	3	27
CO4	2	2	2	1	-	3	-	-	3	2	-	2	3	22
CO5	2	2	2	1	1	2	-	-	3	2	-	2	2	23
<b>Grand total of Cos with PSOs and Pos</b>														<b>117</b>
<b>Grand total with PSOs and POs</b>														
Mean value of Cos with PSO and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (117/59)														<b>1.98</b>

Strong – 3, Medium -2, Low - 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.98	
Observation	COs of Data Communications and Network – Medium related with PSOs and Pos		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**DATA MINING AND DATA WAREHOUSING**

Class	: MCA	Part III : Elective2
Semester	: II	Hours : 60
Subject Code	: 23PCAE22	Credits : 3

**Objectives:**

The course enables the students to

- Know about data mining
- Understand the basic concepts of data warehousing
- Gain knowledge about various techniques of rule mining
- Able to do classification and prediction among data
- Compare and analyze different types of clustering methods for real time problem

**UNIT I DATA MINING (12 Hours)**

Introduction - Steps in KDD - System Architecture – Types of data -Data mining functionalities - Classification of data mining systems - Data Warehouse Design Methodology - Integration of a data mining system with a data warehouse - Issues - Data Preprocessing- Managing the Data Warehouse - Data Mining Applications

**UNIT II DATA WAREHOUSING (12 Hours)**

Data warehousing components - Building a data warehouse - Multi Dimensional Data Model - OLAP Operation in the MultiDimensional Model - Three Tier Data Warehouse Architecture - Schemas for Multi-dimensional data Model – Online Analytical Processing (OLAP) - OLAP Vs OLTP Integrated OLAM and OLAP Architecture

**UNIT III ASSOCIATION RULE MINING (12 Hours)**

Mining frequent patterns - Associations and correlations - Mining methods - Finding Frequent itemset using Candidate Generation - Generating Association Rules from Frequent Itemsets - Mining Frequent itemset without Candidate Generation - Mining various kinds of association rules - Mining Multi-Level Association Rule-Mining MultiDimensional Association RuleMining Correlation analysis - Constraint based association mining.

**UNIT IV CLASSIFICATION AND PREDICTION (12 Hours)**

Classification and prediction - Issues Regarding Classification and Prediction - Classification by Decision Tree Induction -Bayesian classification - Baye’s Theorem - Naïve Bayesian Classification - Bayesian Belief Network - Rule based classification - Classification by Backpropagation - Support vector machines - Prediction - Linear Regression

**UNIT V CLUSTERING, APPLICATIONS AND TRENDS IN DATA MINING (12 Hours)**

Cluster analysis - Types of data in Cluster Analysis - Categorization of major clustering methods -Partitioning methods -Hierarchical methods - Density-based methods - Grid-based methods - Model based clustering methods -Constraint Based cluster analysis - Outlier analysis - Social Impacts of Data Mining- Case Studies: Mining WWW- Mining Text Database Mining Spatial Databases

**Book for Study:**

1. Michael Corey, Michael Abbey, Ian Abramson, Ben Taub, “Oracle 8i Data Warehousing”, 2001, TMH.

2. Jiawei Han Micheline Kamber, "Data mining & Techniques", 2011, Morgan Kaufmann Publishers.

**Books for Reference:**

1. Alex Berson, Stephen J. Smith, Data Warehousing, Data Mining, & OLAP, 2004, Tata McGraw Hill.
2. Usama M. Fayyad, Gregory Piatetsky – Shapiro, Padhrai Smyth And Ramasamy Uthurusamy, Advances In Knowledge Discovery And Data Mining, 1996, The M.I.T Press.
3. Ralph Kimball, The Data Warehouse Life Cycle Toolkit, 1998, John Wiley & sons Inc.
4. Sean Kelly, Data Warehousing In Action, 1997, John Wiley & Sons Inc.

**Web References:**

1. Introduction to DM and DW:  
<https://www.topcoder.com/thrive/articles/data-warehousing-and-data-mining>
2. Applications of Data Mining:  
[https://link.springer.com/chapter/10.1007/978-3-540-30480-7\\_22](https://link.springer.com/chapter/10.1007/978-3-540-30480-7_22)
3. Data Mining: [https://onlinecourses.nptel.ac.in/noc20\\_cs12/preview](https://onlinecourses.nptel.ac.in/noc20_cs12/preview)
4. Introduction to Data Mining and OLAP: <https://www.youtube.com/watch?v=m-aKj5ovDfg>
5. Cluster Analysis: [https://www.tutorialspoint.com/data\\_mining/dm\\_cluster\\_analysis.html](https://www.tutorialspoint.com/data_mining/dm_cluster_analysis.html)

**Teaching Methods**

- Lectures
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

**Course Outcomes:**

On successful completion of the course students will be able to

**CO1:** Understand the basic concepts of Data Mining (K2)

**CO2:** Understand the basic concepts of Data Warehousing (K2)

**CO3:** Identify appropriate rule mining techniques to solve real world problems (K3)

**CO4:** Able to analyze different types of classification (K4)

**CO5:** Compare and evaluate different types of clustering algorithms (K5)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create**

**Mapping Course outcome with PO and PSO**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
<b>CO1</b>	3	2	-	-	2	3	2	1	3	2	3	1	3	25
<b>CO2</b>	3	2	-	-	2	2	1	2	3	3	2	2	3	25
<b>CO3</b>	3	2	-	-	2	3	1	1	3	3	2	2	3	25
<b>CO4</b>	3	2	-	-	1	2	2	-	2	3	2	1	2	20
<b>CO5</b>	3	2	-	-	2	3	2	1	3	2	3	1	3	25
<b>Grand total of COs with PSOs and POs</b>														<b>120</b>

<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs/Number of COs relating with PSOs and POs=(120/54)</b>	<b>2.22</b>
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**Strong - 3, Medium - 2, Low –1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.22
Observation	COs of Data Mining and Data Warehousing – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : MCA** **Part : Core Lab 3**  
**Semester : II** **Hours : 75**  
**Subject Code : 23PCAP32** **Credit : 3**

**DATA STRUCTURES AND ALGORITHMS PRACTICAL**

**COURSE OBJECTIVES:**

- To understand Stack , Queue and Doubly Linked ADT structures.
- To implement different ADT structures with real-time scenarios.
- To analyze the recursion concepts.
- To apply different sorting and tree techniques.
- To implement modern data structures with Python language.

**IMPLEMENT THE FOLLOWING PROBLEMS USING PYTHON 3.4 AND ABOVE**

1. Recursion concepts.
  - i) Linear recursion
  - ii) Binary recursion.
2. Stack ADT.
3. Queue ADT.
4. Doubly Linked List ADT.
5. Heaps using Priority Queues.
6. Merge sort.
7. Quick sort.
8. Binary Search Tree.
9. Minimum Spanning Tree.
10. Depth First Search Tree traversal.

**COURSE OUTCOME:**

On the successful completion of the course, students will be able to,

CO1	Strong understanding in various ADT concepts	K1-K6
CO2	To become a familiar with implementation of ADT models	
CO3	Apply sort and tree search algorithms	
CO4	Evaluate the different data structure models	
CO5	Learn how to develop ADT for the various real-time problems	

K1- Remember, K2 - Understand, K3 - Apply , K4 - Analyze, K5 - Evaluate, K6 -Create

**MAPPING COURSE OUTCOME WITH POS AND PSOS**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	3	2	1	3	-	-	3	3	-	3	3	27
CO2	3	3	3	2	1	3	-	-	3	3	-	3	3	27
CO3	3	3	3	2	1	3	-	-	3	3	-	3	3	27
CO4	3	3	3	2	1	3	-	-	3	3	-	3	3	27
CO5	3	3	3	2	1	3	-	-	3	3	-	3	3	27
<b>Grand total of COs with PSOs and POs</b>														<b>135</b>
Grand total with PSOs and POs Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (135/50)														<b>2.70</b>

Strong – 3, Medium -2, Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.70
Observation	COs Data Structures using C++ Lab – Strongly related with PSOs and Pos		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : MCA** **Part : Core Lab 4**  
**Semester : II** **Hours : 75**  
**Subject Code : 23PCAP42** **Credit : 3**

**WEB TECHNOLOGIES - PRACTICAL**

**COURSE OBJECTIVES:**

**At the end of the course, the student should be able to do:**

- Learn how to create web pages using HTML, CSS and Javascript.
- Implement dynamic web pages using Javascript, JQuery and Angular Java script
- To create web applications using PHP and MySQL
- Create web pages using XML and Cascading Style Sheets
- Create XML documents and Schemas.

**PROGRAM LIST**

1. Develop a web page to display your education details in a tabular format.
2. Develop a web page to display your CV on a web page.
3. Design a Homepage having three links: About Us, Our Services and Contact Us. Create separate web pages for the three links.
4. Design a web page to demonstrate the usage of inline CSS, internal CSS and external CSS.
5. Design an XML document and create a style sheet in CSS & display the document in the browser.
6. Develop a web page to Create image maps.
7. Design a web page to perform input validation using Angular Javascript.
8. Develop a web page in PHP to fetch details from the database.
9. Design a web page to hide paragraph using JQuery
10. Create a web page and add Javascript to handle mouse events and form events

**COURSE OUTCOMES:**

On the successful completion of the course, students will be able

<b>CO1</b>	Design dynamic web pages using JavaScript, JQuery and Angular Java script	K1	LO
<b>CO2</b>	Develop Web pages using HTML, CSS and XML	K2	IO
<b>CO3</b>	Create web application using PHP and MySQL	K3, K4	HO
<b>CO4</b>	Develop interactive web pages using JQuery	K2,K3	HO
<b>CO5</b>	To design dynamic web pages using Angular javascript	K4,K5	HO



## Books for Reference

1. Buddi Kurniawan and Paul Deck, *Servlet, JSP and Spring MVC*, Brainy Software Inc, First Edition, 2015
2. B V Kumar, S Sangeetha, S V Subramaniya, *J2EE Architecture*, Tata McGraw Hill, 2005

## Web References

1. <https://www.udemy.com/course/servlets-jsp-network-programming-using-java>
2. <https://www.edureka.co/blog/servlet-and-jsp-tutorial>
3. <https://www.springboottutorial.com>
4. <https://www.digitalocean.com/community/tutorials/servlet-jsp-tutorial>
5. <https://archive.nptel.ac.in/courses/106/105/106105191/>

## Teaching Methods

- Lecturing
- PPTs
- Group Discussion
- Learning by Assignments
- Video tutorials

## Course Outcomes

On successful completion of the course the students will be able to

CO1: list and employ APIs of J2EE for developing web applications (K4)

CO2: understand transaction processes and management in EJB applications (K2)

CO3: list and employ web servers and web services in server side code development (K4)

CO4: create and deploy EJB applications with data integrity and validation (K6)

CO5: deploy EJB applications on the cloud with domain security using SSL and TLS (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

## Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	3	1	2	3	-	-	3	3	-	3	3	26
CO2	3	2	3	1	2	2	-	-	3	3	-	3	2	24
CO3	3	2	3	1	2	3	-	-	3	3	-	2	3	25
CO4	3	1	2	1	2	3	-	-	3	3	-	3	3	24
CO5	3	1	2	1	1	3	-	-	3	3	-	3	3	23
<b>Grand total of COs with PSOs and POs</b>														<b>122</b>
<b>Grand total with PSOs and POs</b>														
Mean value of COs with PSO and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}} = (122/50)$														<b>2.44</b>

**Strong -3, Medium -2, Low -1**

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.44
Observation	COs of Advanced Java Programming – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class	: MCA	Part	: Core –8
Semester	: III	Hours	: 75
Subject Code	: 23PCAC83	Credits	: 4

**Mobile Application Development**

**Objectives:**

The course enables the students to

- Understand the features of React Native.
- Apply knowledge and skills of Project Components.
- Analyze the elements of Components.
- Apply debugging of react Native app.
- Apply Knowledge to publishing the app.

**UNIT I Overview of Mobile App development & Monetizing Apps 15 hours**

Why mobile apps- App Design Issues and Considerations- App Design –Operating System Design Issues- Screen Size and orientation issues- connectivity issues-battery issues – hardware issues – Device differences android & IOS –App Monetizing strategies- owning your own business – other income possibilities – choosing a platform.

**UNIT II Setup for Android App 15 hours**

Installing Eclipse and set up for Android- Starting new project – set up work space –components of IDE-Android manifest –configure Emulator – Coding the interface – coding the Behaviour –Adding code –Android Navigation and interface design – activities –layouts and intents-Persistent data in android.

**UNIT III Developing IOS APP 15 hours**

Installing Xcode and registering physical devices-Apple Developer Programs-Deploying app to real device-Creating developer account-Using Xcode for IOS APP –Xcode project – project settings-creating the user interface –running the app in the simulator-dismissing keyboard-app icons and launch images.

**UNIT IV Introducing Objective – C 15 hours**

Brief history of Objective C- Two Languages in one – Objects and classes – Properties – Declaring and calling methods- Inheritance and Protocols – memory management.

**UNIT V Publishing, Monetizing and distributing Android Apps 15 hours**

Signing the Android Applications-Versioning android Applications-Publishing Android Applications-Monetizing Applications.

**Books for Study**

1. Jakob Iversen & Micheal Eierman , “ Learning Mobile App Development “ Addison –Wiley, 2014.
2. Pradeep Kothari , “ Android Application Development “ ,Dream Tech , 2014 (UNIT V)

**Web Sites for Reference**

1. <https://developer.ibm.com/technologies/mobile/tutorials/>
2. <https://www.udemy.com/course/learn-android-application-development-y/>

### 3. <https://developer.apple.com/tutorials/app-dev-training/>

#### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learn by Doing
- Video tutorials

#### Course Outcomes

On the successful completion of the course students will be able to

**CO1:** Understand Mobile Application and its Business Issues (K2)

**CO2:** Apply knowledge on developing first project (K3)

**CO3:** Create IOS application (K6)

**CO4:** Create application on xamarin code using objective –c (K6)

**CO5:** Create Apps for Publish on Play store (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

#### Mapping Course outcome with PO and PSO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
<b>CO1</b>	3	3	3	2	1	3	-	-	3	3	-	3	3	27
<b>CO2</b>	3	3	3	2	1	3	-	-	3	3	-	3	3	27
<b>CO3</b>	3	3	3	2	1	3	-	-	3	3	-	3	3	27
<b>CO4</b>	3	3	3	2	1	3	-	-	3	3	-	3	3	27
<b>CO5</b>	3	3	3	2	1	3	-	-	3	3	-	3	3	27
<b>Grand total of COs with PSOs and POs</b>														135
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs/Number of COs relating with PSOs and POs=(135/50)</b>														<b>2.7</b>

Strong – 3, Medium -2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.7
Observation	COs of Mobile Application Development–Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : MCA  
Semester : III  
Subject Code : 23PCAC93

Part : Core –9  
Hours : 75  
Credits : 4

**Big Data Analytics**

**Objectives**

The course enables the students to

- Understand and remember Classification of data.
- Understand the concepts of data science
- Familiar with Hadoop features and working
- Understand the concepts Hadoop Ecosystem
- Understand the concepts of Hive in Big data

**UNIT I** **15 Hours**

**Introduction-** Classifications of digital data – Structured – Semi Structured- Unstructured – Classification of data – What is Big data – Why Big data.

**UNIT II** **15 Hours**

**Big data analytics:** Importance -Classification- Challenges. **Data Science** – Business Acumen Skills – Technology Expertise – Mathematics Expertise – Terminologies.

**UNIT III** **15 Hours**

**Hadoop** –Features – Advantages – Versions – Overview of Hadoop ecosystems – Hadoop Distribution – Hadoop vs SQL – Cloud based Hadoop solution.

**UNIT IV** **15 Hours**

Introducing Hadoop - RDBMS vs Hadoop – Distributed computing challenges – History of Hadoop – Hadoop overview – HDFS – Processing Data with Hadoop.

**UNIT V** **15 Hours**

**Hive** – History – Features – Hive architecture – Data types – File Format - HQL.

**Book for study**

1. Seema Acharya, Subhashini Chellappan, *BIG DATA AND ANALYTICS*, Second Edition, 2019, Wiley India Pvt. Ltd, New Delhi.

**Books for Reference:**

1. DT Editorial Service, *BIG DATA*, 2013, Dreamtech Press, New Delhi.

**Web Reference:**

1. <https://www.geeksforgeeks.org/classification-of-data/>
2. <https://mu.ac.in/wp-content/uploads/2021/11/FULL-BIG-DATA.pdf>
3. <https://www.geeksforgeeks.org/hadoop-an-introduction/>
4. <https://theintactone.com/2023/01/22/terminologies-used-in-big-data-environments/>
5. <https://www.simplilearn.com/tutorials/hadoop-tutorial/hive>

### Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

### Course Outcomes:

On Successful completion of the course the students able to

**CO1:** Analyze the types of digital data (K4)

**CO2:** Understand the Data Science Terminologies. (K3)

**CO3:** Analyze the Hadoop Features (K2)

**CO4:** Analyze the Hadoop eco system. (K3)

**CO5:** Understand the concepts Hive. (K2)

**K1=Remember K2=Understand K3=Apply K4=Analysis K5=EvaluateK6=Create**

### Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	Sum of COs with PSOs & POs
<b>CO1</b>	2	2	-	-	1	2	2	-	3	2	1	1	1	17
<b>CO2</b>	3	3	-	-	1	2	1	-	2	1	1	1	1	16
<b>CO3</b>	3	2	-	-	1	1	1	-	2	1	2	1	1	15
<b>CO4</b>	3	3	-	-	1	1	1	-	3	2	1	1	2	18
<b>CO5</b>	3	3	-	-	1	1	1	-	3	2	1	1	2	18
<b>Grand total of COs with PSOs and POs</b>														<b>84</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(84/50)</b>														<b>1.68</b>

Strong – 3, Medium – 2, Low – 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.68	
Observation	COs of Data Structures and Algorithms – Medium related with PSOs and Pos		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class	: MCA	Part	:III Elective
Semester	: III	Hours	:60
Subject Code	: 23PCAE33	Credit	:3

**CYBER SECURITY**

**Objectives**

This course enables the student to

- Understand the concept of cyber security
- Understand the concept of Network Defense tools Firewalls and Packet Filters
- Analyze and evaluate the cyber security needs of an organization.
- Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.
- Measure the performance and troubleshoot cyber security systems.

**Unit 1**

**12 hours**

Introduction to Cyber Security: Introduction- Classifications of Cybercrimes. Cybercrime: The Legal Perspectives. Cybercrime and the Indian ITA 2000.

**Unit 2**

**12 hours**

**Cyber offenses:** How criminals plan the Attacks, Social Engineering- Cyber talking.**Cybercrime:** Introduction-credit card frauds in mobile and wireless computing era- authentication service Security- attacks on Mobile/Cell Phones- Mobile Devices: Security Implications for Organizations.

**Unit 3**

**12 hours**

**Tools and Methods used in Cybercrime:** Introduction- phishing-Password Cracking- Keyloggers and Spywares- Virus and Worms- Trojan Houses and Backdoors- Steganography-DoS and DDoS Attacks-SQL Injection. **Phishing and Identity Theft:** Introduction-Phishing- Identity Theft( ID Theft).

**Unit 4**

**12 hours**

**Cyber crimes and Cyber security:** The Legal Perspectives: Cybercrime and Legal Landscape around the world- The Indian IT Act. **Understanding computer Forensics:** Introduction- Cyber forensics ND Digital Evidence- Digital Forensics Life Cycle. **Forensics of Hand-Held Devices:** Understanding cell phone working characteristics- Hand-held devices and digital forensics.

**Unit 5**

**12 hours**

**Cyber Security: Organizational Implications:** Introduction cost of cybercrimes and IPR Issues-Web Threats for organizations: the evil and perils- Security and privacy implications. Social Media Marketing: security risks and Perils for organization. **Cybercrime and Cyber terrorism:** Introduction, Intellectual Property in the Cyberspace- The ethical Dimension of Cybercrimes.

**Book for study**

1. Nina Godbole, Sunit Belapure, "Cyber Security: Understanding Cyber crimes, Computer Forensics and Legal Perspectives", First Edition, Wiley India, 2011

## REFERENCE

1. Charles Pfleeger, Shari Pfleeger, Jonathan Margulies, "Security in Computing", Fifth Edition, Prentice Hall, New Delhi, 2015.

## COURSE OUTCOMES:

- CO1: Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
- CO2: Apply the different cryptographic operations of symmetric cryptographic algorithms
- CO3: Apply the different cryptographic operations of public key cryptography
- CO4: Apply the various Authentication schemes to simulate different applications.
- CO5: Understand various cyber crimes and cyber security.

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

## Mapping Course Outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	2	3	3	2	3	-	-	3	3	-	3	3	28
CO2	3	2	3	3	2	2	-	-	3	3	-	3	3	27
CO3	3	2	3	3	2	3	-	-	3	3	-	3	3	28
CO4	3	2	3	3	2	3	-	-	3	3	-	3	3	28
CO5	3	2	2	3	2	3	-	-	3	3	-	3	3	27
<b>Grand total of COs with PSOs and POs</b>														<b>138</b>
Grand total with PSOs and POs														
Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}} = (138/50)$														<b>2.76</b>

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.76
Observation	COs of Cyber Security– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class	: MCA	Part	: Core Lab - 5
Semester	: III	Hours	: 75
Subject Code	: 23PCAP53	Credit	: 4

**ADVANCED JAVA PROGRAMMING - PRACTICAL**

**Objectives:**

The course enables the students to

- Employ Java Enterprise APIs for Data Validation and Transaction Management
- List and Deploy web servers and web services for running server side scripts
- Create and Deploy Java Archive files (JAR) and manifest skeleton code
- Create and Deploy Database Applications using Java Servlet objects and Java Beans
- Incorporate Java beans into JSP application

**LIST OF EXPERIMENTS**

1. Create simple web application for login session validation
2. Create simple web application for course registration with data validation
3. Create simple web application for feedback system implementation
4. Create simple database web application that implements SQL statements
5. Create simple database web application that handles JSON objects (use MongoDB)
6. Create and deploy simple java servlets that implements Data Validation
7. Create and deploy simple java servlets that implements data transaction management
8. Create and deploy simple java servlets that implements session and cookie management
9. Create and deploy simple java bean application that implements session management
10. Create and deploy simple java bean application that implements MVC design model
11. Create and deploy simple java bean application that implements secured data caching
12. Develop JSP script that implements SQL statements (use open source DB)
13. Develop JSP script that connects and interacts with non-SQL DB (use MongoDB)
14. Develop JSP script that incorporates Java servlet objects and SQL based DB
15. Develop JSP script that incorporates EJB objects and non-SQL based DB

**Teaching Methods**

- Tutoring in the Laboratory
- Demonstration
- Video Tutorials
- Learning by Implementation

**Course Outcomes**

On successful completion of course the students will be able to

- CO1: Implement Data Validation and Transaction Controls (K4)  
CO2: Understand and Practice web hosting and host management services (K2)  
CO3: Choose appropriate web server and service for hosted web applications (K5)  
CO4: Integrate web applications with both SQL and non-SQL based DB systems (K5)  
CO5: Develop and Deploy web applications on the public cloud platforms (K6)  
K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course Outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	2	3	3	2	3	-	-	3	3	-	3	3	28
CO2	3	2	3	3	2	2	-	-	3	3	-	3	3	27
CO3	3	2	3	3	2	3	-	-	3	3	-	3	3	28
CO4	3	2	3	3	2	3	-	-	3	3	-	3	3	28
CO5	3	2	2	3	2	3	-	-	3	3	-	3	3	27
<b>Grand total of COs with PSOs and POs</b>														<b>138</b>
Grand total with PSOs and POs														
Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}} = (138/50)$														<b>2.76</b>

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.76
Observation	COs of Advanced Java Programming Lab– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class	:MCA	Part	:Core Lab-6
Semester	:III	Hours	:75
Subject Code	:23PCAP63	Credit	:3

**MOBILE APPLICATION DEVELOPMENT – PRACTICAL**

**Objectives:**

The course enables the students to

- Create application on Native mobile app features.
- Deploy application on different layout managers and views.
- Create mobile applications by implementing implicit and explicit indents.
- Create mobile app with Sqlite database connectivity

**LIST OF EXPERIMENTS**

1. Create simple mobile application for login page.
2. Create a mobile app to designing user interface based on layouts.
3. Create mobile app to read file from SD card.
4. Create simple mobile app launch icon.
5. Create simple mobile application for event registration with data validation
6. Create simple mobile app to send SMS
7. Create mobile app to make a call.
8. Create simple mobile app to call camera.
9. Create mobile app to select course details.
10. Create simple mobile app to order food items using check box.
11. Create simple mobile app to create calculate
12. Create mobile app to perform event listener using buttons.
13. Create mobile app to give notification upon receiving messages.
14. Create mobile app to display image using multithreading.
15. Create mobile app to create BMI calculator
16. Create mobile app to insert and display records using database sqlite
17. Work with Xcode IDE to create simple IOS app using Objective - C

**Teaching Methods**

- Tutoring in the Laboratory
- Demonstration
- Video Tutorials
- Learning by Implementation

**Course Outcomes**

On the successful completion of the course the students will able to

- CO1** Create simple programs using mobile emulator and devices (K3)
- CO2** Implement apps using JAVA (K3)
- CO3** Create Native mobile application (K6)
- CO4** Apply database concepts to develop real time applications (K3)
- CO5** Develop IOS Mobile Apps (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course Outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	3	3	2	2	-	-	3	3	-	3	3	28
CO2	3	2	3	3	2	3	-	-	3	2	-	3	3	27
CO3	3	2	2	3	2	3	-	-	3	2	-	3	2	25
CO4	3	2	2	3	2	3	-	-	3	2	-	2	3	25
CO5	3	2	2	3	2	3	-	-	3	2	-	3	2	25
<b>Grand total of COs with PSOs and POs</b>														<b>130</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(130/50)</b>														<b>2.6</b>

**Strong-3, Medium -2, Low-1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.6
Observation	COs of Mobile Application Development Lab-Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : MCA  
Semester : III  
Subject Code : 23PINT13

Part : III Core - 15  
Hours :  
Credit : 2

**INTERNSHIP**

**Objectives:**

The course enables the students to

- Understand and have working experience of the industry
- Analyze the real time problems
- Exposure to gain more knowledge in current field.
- Improve and enhance their skills

**Guidelines**

- All the students are expected to choose internship
- All the students are expected to submit attendance and company undertaking and project completion certificate during the internship duration.
- Three copies of the record note book must be submitted to the department duly signed by guide/supervisor and Head of the Department.

**Examination/ Evaluations**

The thesis/record notebook will be evaluated by the internal examiner and external examiner who are appointed by the Office of the Controller of Examination. The candidate also will be evaluated based on viva-voce and presentation of the record notebook and will be graded as shown below.

Excellent - 85% and above  
Very Good- 75% and above but below 85%  
Good-60% and above but below 75%  
Satisfactory-50% and above but below 60%  
Rejected-Less than 50%

**Course Outcomes:**

On successful completion of the course students will be able to

- CO1** Identify and plan the real problems of industry. (K2)
- CO2** Implements programming skills to live projects
- CO 3** Apply and Design the Project. (K3)
- CO 4** Implement the Project.(K5)
- CO 5** Create the Project.(K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	2	-	1	3	1	-	3	3	2	3	3	26
CO2	3	2	2	-	2	3	1	-	3	3	2	3	3	27
CO3	3	2	3	-	2	3	1	-	3	3	2	3	2	27
CO4	2	3	3	-	2	3	1	-	2	2	2	2	3	25
CO5	3	3	3	-	2	2	1	-	3	3	2	3	2	27
<b>Grand total of COs with PSOs and Pos</b>														<b>132</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(132/55)</b>														<b>2.4</b>

**Strong -3, Medium -2, Low -1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs With PSOs and POs			2.4
Observation	COs of Project Work/Internship Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class	: MCA	Part	: Core – 10
Semester	: IV	Hours	: 90
Subject Code	: 23PCAD04	Credit	: 4

**Industry Dynamics Technology-R Programming**

**Objectives:**

The course enables the students to

- Understand R programming fundamentals and its code repository
- Explore R libraries and packages for Mathematical and Statistical Functions
- List and employ graphics utilities for Data representation
- Explore Data in more dimensions with R packages of Data Visualization
- Understand Industry standard analytics with R and Tableau

**Unit I Introduction (18 Hours)**

Comprehensive R Archive Network – Installing and Loading R packages – Console and Editor Panes – Comments – Working Directory – Workspaces – Scripts – Code Conventions – Math and Equation References – R for Basic Math – Assigning Objects – Vectors – Matrices and Arrays – Non-Numeric Values – List and Data Frames – Special Values and Classes

**Unit II Math and Statistics (18 Hours)**

Mathematical Operations – Summary Statistics – Test of Distribution – Parametric Test – Non Parametric Test – Correlation – Association – Goodness of fit – ANOVA – Linear Modelling – Clustering – Time Series – Non Linear Modelling -Optimization

**UNIT III Graphics (18 Hours)**

Types of Graphs – Saving Graphs – Adding Data – Adding Lines – Adding Shapes – Adding Text – Adding Legends – Altering Color – Altering axis parameters – Altering Text Parameters – Altering Line Parameters – Altering plot Margins – Altering graph window

**UNIT IV Data Visualization (18 Hours)**

Data in Higher dimensions – Sunflower Plot – Hexbin Plot – Interactive Calendar maps – Coxcomb Plot – Network Plot – Radial Plot – Candlestick Plot – Box and Whiskers Plot – Violin Plot – QQ plot – Density Plot – Simple Correlation Plot – Generating Plots with Custom Fonts

**UNIT V Industry Standard Analytics (18 Hours)**

CRISP DM model – Data Preparation – Data Modelling – Data Evaluation – Data Deployment – Team Data Science Process – Working with Dirty Data – Summarize Data with dplyr – Prediction in R – Residual Standard Error – Investigating Data Relationship – Replicating Results – Multiple Regression Model – Confusion Matrix

**Books for Study**

1. Tilman M. Davies, *The Book of R: A First Course in Programming and Statistics*, William Pollock, 2016
2. Mark Gardener, *The Essential R Reference*, John Wiley & Sons Inc., 2013
3. Atmajitsinh Gohil, *R Data Visualization Cookbook*, Packt publishing, 2015
4. Jen Stirrup and Ruben Oliva Ramos, *Advanced Analytics with R and Tableau*, Packt Publishing, 2017

## Books for Reference

1. Norman Matloff, *The Art of R Programming: A Tour of Statistical Software Design*, William Pollock, 2011
2. Roger D. Peng, *R Programming for Data Science*, Lean Publishing, 2015
3. Garrett Golemund, *Hands on Programming with R*, O'Reilly, 2014

## Web References

1. <https://cran.r-project.org/>
2. <https://www.w3schools.com/r>
3. <https://www.coursera.org/learn/r-programming>
4. <https://www.javatpoint.com/r-tutorial>
5. <https://archive.nptel.ac.in/courses/111/104/111104147/>

## Teaching Methods

- Lecturing
- Group Discussions
- Learning by Demonstration
- Video tutorials

## Course Outcomes

On successful completion of the course the students will be able to

**CO1** Understand R programming fundamentals and package repositories (K2)

**CO2** Understand R packages for the implementation of Statistical Models (K2)

**CO3** Plot graphical representation of data using graphic packages of R (K4)

**CO4** Understand Data Dimensions and their visualization methods using R (K2)

**CO5** Industry Standard data Analytics by using R and Tableau (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

## Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	2	3	1	2	3	-	1	2	3	-	3	3	26
CO2	3	2	3	1	2	2	-	-	3	2	1	3	2	24
CO3	3	2	3	1	2	2	1	-	3	3	-	2	3	25
CO4	3	1	2	1	2	3	-	-	3	3	-	3	3	24
CO5	3	1	2	1	1	3	-	1	3	3	1	2	3	24
<b>Grand total of COs with PSOs and POs</b>														<b>123</b>
Grand total with PSOs and POs														
Mean value of COs with PSO and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}} = (123/50)$														<b>2.46</b>

**Strong -3 , Medium -2 , Low -1**

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.46
Observation	COs of Advanced Java Programming – Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class : MCA  
Semester : IV  
Subject Code : 23PCAD14

Part : Core – 11  
Hours : 90  
Credit : 4

**Machine Learning**

**Objectives:**

The course enables the students to

- Understand Concepts of design in learning system
- To solve Classification and Regression problems
- Compare the Algorithms in machine learning
- Analyze the Bayes theorem and concept learning
- Distinguish Analytical and inductive learning

**Unit – 1 INTRODUCTION**

**(18 HOURS)**

Designing a learning system - Perspectives and Issues in machine learning - Concept learning task - Concept learning as search - Version spaces - Candidate Elimination learning algorithm - Inductive Bias.

**Unit – 2 DECISION TREE LEARNING**

**(18 HOURS)**

Decision Tree representation - Appropriate Problems for Decision Tree Learning - Basic Decision tree learning algorithm - Hypothesis space search and Inductive Bias in Decision tree learning - Issues in Decision Tree Learning – CART Algorithm.

**Unit – 3 ANN**

**(18 HOURS)**

Perceptions - Types - Back propagation Algorithms. **Evaluating Hypothesis:** Deriving confidence intervals - Hypothesis testing - comparing learning algorithms – Confidence Interval.

**Unit – 4 BAYESIAN LEARNING**

**(18 HOURS)**

Bayes Theorem and Concept learning - Maximum Likelihood and Least Squared error hypothesis - Maximum Likelihood hypotheses for predicting probabilities - Minimum description Length principle - Bayes optimal classifier - Gibbs algorithm - Naïve Bayes classifier - Bayesian Belief networks -EM algorithm.

**Unit – 5 ANALYTICAL AND INDUCTIVE LEARNING**

**(18 HOURS)**

Analytical learning - Explanation based learning - Inductive Analytical approaches to learning - **Using prior knowledge to initialize the hypothesis:** KBANN Algorithm – **Using prior knowledge to alter search objective:** Tangent Prop – EBNN Algorithm. KBANN Algorithm - **Using prior knowledge to Augment search operators.**

**Books for Study**

1. Mitchell Tom M, *Machine Learning*, 2017, McGraw-Hill Education (India) Private Limited.

**Books for References**

1. EthemAlpaydinTom M ., *Introduction to Machine Learning*, Fourth Edition, 2020,MIT Press.
2. Marsland Stephan, *Machine Learning - An Algorithmic Perspective"*, First Edition, 2009, Chapman and Hall.
3. Nils Nilsson, *Introduction to Machine Learning*, 1997, MIT Press.

## Web References

1. <https://nptel.ac.in/courses/106106139>
2. <https://www.udemy.com/course/understanding-machine-learning/>
3. <https://www.geeksforgeeks.org/introduction-machine-learning/>
4. <https://www.javatpoint.com/basic-concepts-in-machine-learning>
5. <https://www.cs.ox.ac.uk/people/nando.defreitas/machinelearning/>
6. <https://www.techtarget.com/searchenterpriseai/definition/machine-learning-ML>

## Teaching Methods

- Lecturing
- Group Discussions
- PPT's
- Learning by Doing
- Video tutorials

## Course Outcomes

On the successful completion of the course students will be able to

**CO1** Understand about the various Concepts of design a learning system (K2)

**CO2** Analyze the Problems for Decision Tree Learning (K3)

**CO3** Analyze the concepts of Learning Algorithm (K4)

**CO4** Understand the concept of Bayes theorem. (K2)

**CO5** Apply the knowledge in analytical and inductive learning (K3)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

## Mapping Course Outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	2	1	1	2	-	-	2	2	-	2	2	20
CO2	3	2	2	1	1	2	-	-	2	2	-	2	3	20
CO3	2	3	3	2	1	2	-	-	3	2	-	2	2	22
CO4	3	2	2	2	1	2	-	-	2	1	-	2	1	18
CO5	3	2	2	1	1	2	-	-	3	1	-	2	1	18
<b>Grand total of COs with PSOs and POs</b>														<b>98</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs/Number of COs relating with PSOs and POs=(98/50)</b>														<b>1.96</b>

Strong – 3, Medium -2, Low - 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.96	
Observation	COs of Machine Learning– Medium related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

Class	: MCA	Part	: Core Lab - 7
Semester	: IV	Hours	: 75
Subject Code	: 23PCAP74	Credit	: 3

**MACHINE LEARNING PRACTIAL**

**Objectives**

The course enables the students to

- To Learn about Machine Intelligence and Machine Learning applications
- To understand the theoretical and practical aspects of Probabilistic Graphical Models
- To understand how to perform evaluation of learning algorithms and model selection

**LIST OF EXPERIMENTS**

1. Given a dataset. Write a program to compute the Covariance, Correlation between a pair of attributes. Extend the program to compute the Covariance Matrix and Correlation Matrix.
2. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
3. Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions. Python ML library classes can be used for this problem.
4. Write a program to implement feature reduction using Principle Component Analysis
5. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering a few test data sets.
6. Given a dataset for classification task. Write a program to implement Support Vector Machine and estimate its test performance.
7. Build an Artificial Neural Network by implementing the Back propagation algorithm and test the same using appropriate data sets.
8. Write a program to implement K means clustering algorithm. Select your own dataset to test the program. Demonstrate the nature of output with varying value of K.

**Teaching Methods**

- Tutoring in the Laboratory
- Demonstration
- Video Tutorials
- Learning by Implementation

### Course Outcomes

On successful completion of course the students will be able to

**CO1** Have a good understanding of the fundamental issues and challenges of machine learning.

**CO2** Have an understanding of the strengths and weaknesses of many popular machine learning approaches.

**CO3** Be able to design and implement various machine learning algorithms in a range of real-world applications.

**CO4** Use a tool to implement typical clustering algorithms for different types of applications

Design and implement an HMM for a sequence model type of application

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

### Mapping Course Outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	3	3	2	3	-	-	3	3	-	3	3	28
CO2	3	2	3	3	2	2	-	-	3	3	-	3	3	27
CO3	3	2	3	3	2	3	-	-	3	3	-	3	3	28
CO4	3	2	3	3	2	3	-	-	3	3	-	3	3	28
CO5	3	2	2	3	2	3	-	-	3	3	-	3	3	27
<b>Grand total of COs with PSOs and POs</b>														<b>138</b>
Grand total with PSOs and POs														
Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}}$ = (138/50)														<b>2.76</b>

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.76
Observation	COs of Machine Learning Lab– Strongly related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**ADVANCED SOFTWARE ENGINEERING**

Class : MCA

Part : Core-12

Semester : IV

Hours : 90

Subject Code : 23PCAD24

Credit : 4

**Objectives:**

The course enables the students to

- Understand the basic software engineering design concepts and models.
- Analyze various requirement engineering tasks.
- Understand the various software design models and concepts.
- Analyze the various software testing strategies.
- Describe managerial techniques and Software Quality Assurance.

**UNIT I**

**(18 HOURS)**

Generic View of Process – Process Models - The Waterfall Model - Incremental Model - Evolutionary Model - The Unified Process– Software Cost Estimation – Planning – Risk Analysis – Software Project Scheduling-Agile Development – Agility and cost of change-agile process – Extreme Programming (XP)- ASD – Scrum- DSDM- FDD –LSD –Agile modeling-Agile Unified Process.

**UNIT II**

**(18 HOURS)**

System Engineering Hierarchy – System Modeling – Requirements Engineering Tasks- Initiating the Process - Eliciting Requirements - Negotiating Requirements - Validating Requirements – Building the Analysis Models.

**UNIT III**

**(18 HOURS)**

Design Concepts – Design Models – Pattern Based Design – Architectural Design – Component Level Design – Component – Class Based And Conventional Components Design – User Interface – Analysis And Design-Web App Design- Design Quality – Design Goals-Web app Interface Design-Aesthetic design- Content Design- Architectural design-Navigation Design-Component level design-OOHDM

**UNIT IV**

**(18 HOURS)**

Software Testing Strategies: Conventional - Object Oriented – Validation Testing – criteria – Alpha – Beta Testing- System Testing – Recovery – Security – Stress – Performance - Testing Tactics – Testing Fundamentals - Black Box – White Box – Basis Path - Control Structure-Testing of Web APPS.

**UNIT V**

**(18 HOURS)**

Software Configuration and Management: Features – SCM Process – Software Quality Concepts – Quality Assurance – Software Review – Technical Reviews – Formal Approach to Software Quality Assurance – Reliability – Quality Standards – Software Quality Assurance Plan.

**Book for Study**

1. Richard Fairly , “ software Engineering Concepts “, Mc Raw Hill Education , 2017.
2. Pressman Roger, Software Engineering: A Practitioner's Approach, Seventh Edition,

TataMcGraw Hill, 2017

**Books for Reference**

- 1.Pfleeger LawrenceShari, Software Engineering: Theory and Practice, 2003, Prentice Hall.
- 2.GhezziCarlo, Jazayari Mehdi, Mandrioli Dino, Fundamentals of Software Engineering, 2003, Prentice Hall of India.
- 3.Sommerville Ian, Software Engineering,Tenth Edition, 2017, Pearson Publications.

**Web reference**

- 1.Software quality factors:  
[https://www.tutorialspoint.com/software\\_quality\\_management/software\\_quality\\_m anagement\\_fa ctors.htm](https://www.tutorialspoint.com/software_quality_management/software_quality_management_fa ctors.htm)
- 2.Cost estimation model:<https://www.geeksforgeeks.org/cost-estimation-models-in-software-engineering/>
- 3.SRS document:<https://www.geeksforgeeks.org/software-requirement-specification-srs-format/>
- 4.DesignTechniques:[https://www.tutorialspoint.com/software\\_engineeri ng](https://www.tutorialspoint.com/software_engineeri ng)
- 5.Verification & validation: <https://www.javatpoint.com/verification-and-validation-testing>

**Course Outcomes**

On the successful completion of the course students will be able to

- CO1** Understand about the various Concepts of software engineering models (K2)
- CO2** Analyze the Problems for Requirement engineering(K4)
- CO3** Analyze the concepts of various design concepts (K4)
- CO4** Understand the concept of software testing concepts. (K2)
- CO5** Apply the knowledge software configuration management. (K3)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

**Mapping Course Outcome with POs and PSOs**

	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
<b>CO1</b>	3	3	2	1	1	2	-	-	2	2	-	2	2	20
<b>CO2</b>	3	2	2	1	1	2	-	-	2	2	-	2	3	20
<b>CO3</b>	2	3	3	2	1	2	-	-	3	2	-	2	2	22
<b>CO4</b>	3	2	2	2	1	2	-	-	2	1	-	2	1	18
<b>CO5</b>	3	2	2	1	1	2	-	-	3	1	-	2	1	18
<b>Grand total of COs with PSOs and POs</b>														98
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs/Number of COs relating with PSOs and POs=(98/50)</b>														1.96

Strong – 3, Medium -2, Low - 1

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.96	
Observation	COs of Machine Learning– Medium related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**Class : MCA**

**Part : Core 12**

**Semester : IV**

**Hours : 30**

**Subject Code :**

**Credit : 1**

**Professional Ethics**

**OBJECTIVES:**

- To understand the concepts of computer ethics in work environment.
- To understand the threats in computing environment
- To Understand the intricacies of accessibility issues
- To ensure safe exits when designing the software projects

**UNIT I INTRODUCTION TO ETHICS**

**(6 hours)**

Definition of Ethics- Right, Good, Just- The Rational Basis of Ethics -Theories of Right: Intuitionist vs. End-Based vs. Duty-Based -Rights, Duties, Obligations -Theory of Value - Conflicting Principles and Priorities -The Importance of Integrity -The Difference Between Morals, Ethics, and Laws -Ethics in the Business World - Corporate Social Responsibility - Creating an Ethical Work Environment -Including Ethical Considerations in Decision Making

**UNIT II ETHICS IN INFORMATION TECHNOLOGY, INTERNET CRIM**

**(6 hours)**

IT Professional Ethics, Three Codes of Ethics, Management Conflicts. The Reveton Ransomware Attacks -IT Security Incidents: A Major Concern - Why Computer Incidents Are So Prevalent - Types of Exploits -Types of Perpetrators-Federal Laws for Prosecuting Computer Attacks- Implementing Trustworthy Computing -Risk Assessment - Establishing a Security Policy - Educating Employees and Contract Workers

**UNIT III FREEDOM OF EXPRESSION, PRIVACY**

**(6 hours)**

First Amendment Rights -Obscene Speech-Defamation -Freedom of Expression: Key Issues - Controlling Access to Information on the Internet -Strategic Lawsuit Against Public Participation (SLAPP)-Anonymity on the Internet-Hate Speech- Privacy Protection and the Law- Information Privacy- Privacy Laws, Applications, and Court Rulings-Key Privacy and Anonymity Issues- Data Breaches -Electronic Discovery-Consumer Profiling- Workplace Monitoring -Advanced Surveillance Technology

**UNIT IV FREEDOM OF EXPRESSION, INTELLECTUAL PROPERTY RIGHTS**

**(6 hours)**

Intellectual Property Rights-Copyrights-Copyright Term - Eligible Works -Fair Use Doctrine - Software Copyright Protection -Copyright Laws and the internet-Copyright and Piracy- Patents-Software Patents -Cross-Licensing Agreements -Trade Secrets-Trade Secret Laws -Employees and Trade Secrets-Key Intellectual Property Issues-Plagiarism -Reverse Engineering-Open Source Code- Competitive Intelligence -Trademark Infringement -Cyber squatting

**UNIT V SOCIAL NETWORKING ETHICS AND ETIQUETTES**

**(6 hours)**

Social Networking Web Site- Business Applications of Online Social Networking-Social Network Advertising-The Use of Social Networks in the Hiring Process-Social Networking Ethical Issues –

## Cyber bullying- Online Virtual Worlds-Crime in Virtual Worlds-Educational and Business Uses of Virtual Worlds

### Book for Study

1. Caroline Whitback, "Ethics in Engineering Practice and Research ", Cambridge University Press, 2<sup>nd</sup> Edition 2011.
2. George Reynolds, "Ethics in Information Technology", Cengage Learning , 6<sup>th</sup> Edition 2018.
3. Barger, Robert. (2008). Computer ethics: A case-based Approach Cambridge University Press 1<sup>st</sup> Edition.
4. John Weckert and Douglas Adeney, Computer and Information Ethics, Greenwood Press, First Edition 1997.

### Books for Reference

1. Penny Duquenoy, Simon Jones and Barry G Blundell, "Ethical, legal and professional issues in computing", Middlesex University Press, First Edition 2008.
2. Sara Baase, "A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet", 3rd Edition, Prentice Hall, 2008.

### Web reference

1. [http://www.infosectoday.com/Articles/Intro\\_Computer\\_Ethics.html](http://www.infosectoday.com/Articles/Intro_Computer_Ethics.html)

### Course Outcome

Upon Completion of the course, the students will be able to

- CO1** Helps to examine situations and to internalize the need for applying ethical principles, values to tackle with various situations.
- CO2** Develop a responsible attitude towards the use of computer as well as technology.
- CO3** Able to envision the societal impact on the products/ projects they develop in their career
- CO4** Understanding the code of ethics and standards of computer professionals.
- CO5** Analyze the professional responsibility and empowering access to information in the work place.

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

### Mapping Course Outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	2	1	1	2	-	-	2	2	-	2	2	20
CO2	3	2	2	1	1	2	-	-	2	2	-	2	3	20
CO3	2	3	3	2	1	2	-	-	3	2	-	2	2	22
CO4	3	2	2	2	1	2	-	-	2	1	-	2	1	18
CO5	3	2	2	1	1	2	-	-	3	1	-	2	1	18
<b>Grand total of COs with PSOs and POs</b>														<b>98</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs/Number of COs relating with PSOs and POs=(98/50)</b>														<b>1.96</b>

**Strong – 3, Medium -2, Low – 1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.96	
Observation	COs of Professional Ethics– Medium related with PSOs and POs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**PROJECT**

Class	: MCA	Part	: III
Semester	: IV	Hours	: 75
Subject Code	: 23PCAD44	Credit	: 7

**Objectives:**

The course enables the students to

- Understand and Plan the real problem of the Project.
- Analyze the problem.
- Design the Project.
- Implement the Project.
- Configured and Test the Project.

**Guidelines**

- All the students are expected to choose project in IT Related Company/Industry/real project in schools/College/any authorized organization/Institutions.
- Each student will be allocated guide/supervisor by the department for smooth/best way to complete the project.
- All the students are expected to submit attendance and company undertaking and project completion certificate during the period of project allotted duration.
- Three copies of the thesis/record note book must be submitted to the department duly signed by guide/supervisor and Head of the Department.

**Examination/ Evaluations**

The thesis/record notebook will be evaluated by the internal examiner and external examiner who are appointed by the Office of the Controller of Examination. The candidate also will be evaluated based on viva-voce and presentation of the thesis/record notebook and will be graded as shown below.

Excellent	85% and above
Very Good	75% and above but below 85%
Good	60% and above but below 75%
Satisfactory	50% and above but below 60%
Rejected	Less than 50%

**Course Outcomes:**

On successful completion of the course students will be able to

- CO 1** Identify and plan the real problem of the Project. (K2)
- CO 2** Analyze the problem of the Project. (K4)
- CO 3** Apply and Design the Project. (K3)
- CO 4** Implement the Project.(K5)
- CO 5** Create the Project.(K6)

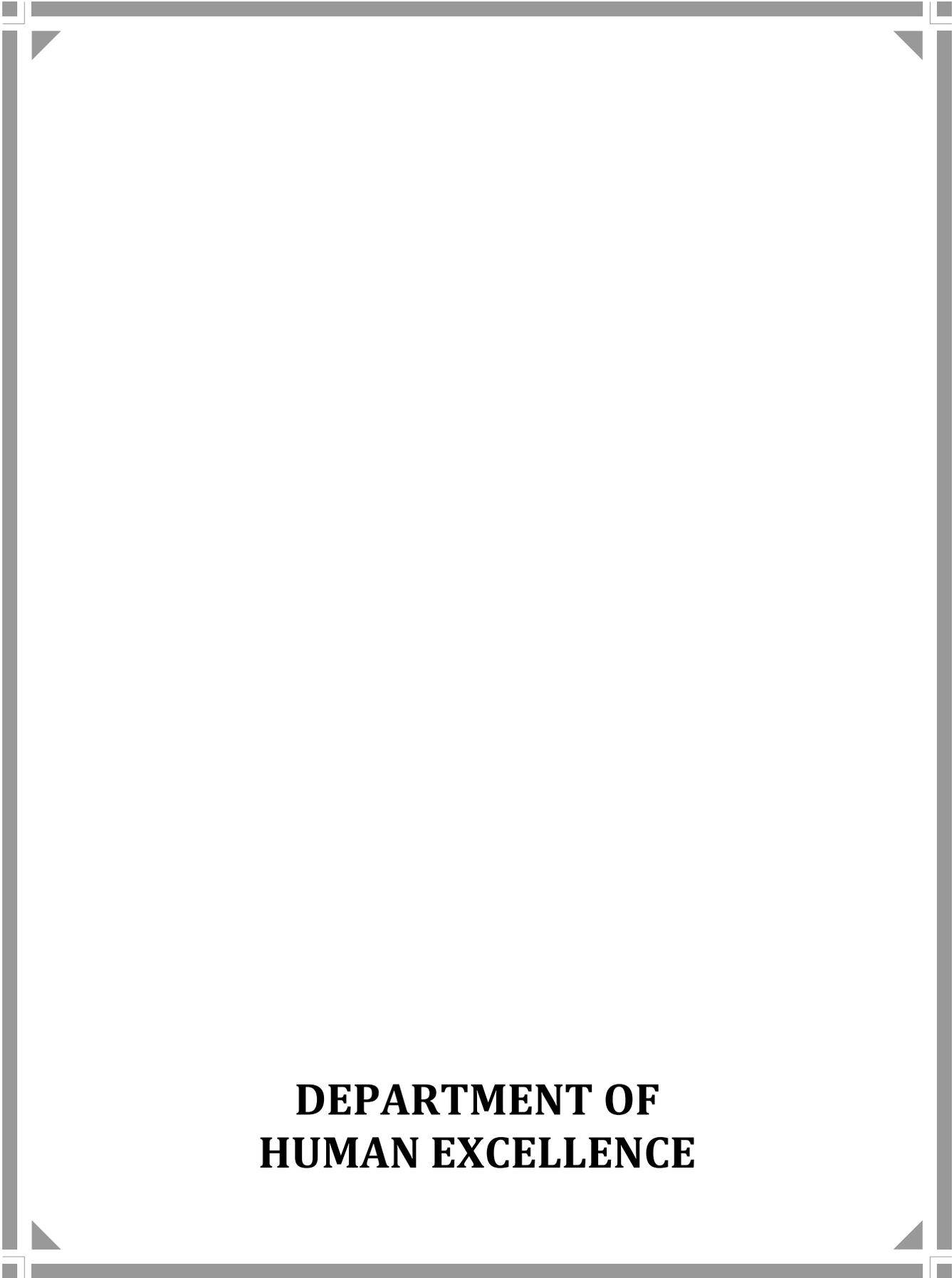
K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

**Mapping Course outcome with POs and PSOs**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	2	-	1	3	1	-	3	3	2	3	3	26
CO2	3	2	2	-	2	3	1	-	3	3	2	3	3	27
CO3	3	2	3	-	2	3	1	-	3	3	2	3	2	27
CO4	2	3	3	-	2	3	1	-	2	2	2	2	3	25
CO5	3	3	3	-	2	2	1	-	3	3	2	3	2	27
<b>Grand total of COs with PSOs and Pos</b>														<b>132</b>
<b>Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(132/55)</b>														<b>2.4</b>

**Strong -3, Medium -2, Low -1**

<b>Mapping Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
MeanValue of COs With PSOs and POs			2.4
Observation	COs of Project Work/Internship Strongly related with PSOs and POs		



**DEPARTMENT OF  
HUMAN EXCELLENCE**



ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF HUMAN EXCELLENCE

SOFT SKILL - I

(For those who joined from June 2022 onwards)

**Class** : III UG

**Part** : IV

**Semester** : V

**Hours** : 30

**Subject Code** :

**Credits** :

**Objective:**

This course aims at preparing learners for interviews by providing intensive exposure to soft skills.

**UNIT 1:**

(6 Hrs)

***Introduction of Soft Skills and Body Language***

What is Soft Skill? - Essential role of Soft Skills – Interpersonal Skills – Communication Skills - Thinking Skills – Presentation Skills – Problem Solving Skills – Decision Making Skills - Negotiation Skills - Communicating with the body Language – Reading body Language -Body Language Mistakes – Gender Differences – Improve our body Language.

**UNIT 2:**

(6 Hrs)

***Preparing Resume & Interview Skills***

Meaning and purpose of Resume – Types of Resumes – Model Resumes – Preparing the covering letter – Introduction of Interview – Interview Panels - Do's in interview-Don'ts in interview-Tips to improve interview performance-Things to do after interview – Stress Relief Exercises

**UNIT 3:**

(6 Hrs)

***Group Discussion & Etiquette at Workplace***

The concept and purpose of group discussion - Do's and don'ts of group discussion-Tips to improve your group -Tactful skills for group discussion - Job group discussion process - Obstacles to overcome- Conflict resolution techniques - Mock group discussion exercises – Introduction of Etiquette – Modern Etiquette – Benefits of Etiquette – Etiquette at Workplace.

**UNIT 4:**

(6 Hrs)

***Quantitative Aptitude***

Percentage – Profit and Loss – Simple and Compound Interest – Area and Volume of the Surfaces – Time and Work – Pipes and Cisterns – Problems on Age.

**UNIT 5:**

(6 Hrs)

Test of Reasoning: Verbal Reasoning – Coding & Decoding, Calendar – Seating Arrangements, Assertion etc.

**Recommended Activities:**

1. <https://www.wrike.com/blog/top-15-problem-solving-activities-team-master/>
2. <https://www.indeed.com/career-advice/career-development/problem-solving-games-workplace>
3. <https://www.splashlearn.com/blog/problem-solving-activities-for-kids/>
4. <https://in.indeed.com/career-advice/resumes-cover-letters/communication-skills>
5. <https://www.indeed.com/career-advice/interviewing/interview-exercise>

### Book for Study

1. Alex.K: Soft Skills: Know Yourself and Know the World, S.Chand Publishing, India, 2012  
ISBN:9788121931922, 8121931924
2. Aggarwal,R.S.(2010). Quantitative Aptitude, S.Chand & Sons.

### References:

1. Thamburaj, Francis: Inter-Personal Soft Skills for Professional Excellence, Vijay Nicole Publication, In Print, Chennai, 2019
2. Francis, Peter: Soft Skills and Professional Communication, Tata McGraw Hill Publication, New Delhi, 2012 ISBN-13:9780071078115 \
3. Alphonse, Xavier: We Shall Overcome: A Text Book on Life Coping Skills, ICRDCE Publication, Chennai, 2008
4. Thamburaj, Francis: Journey from Excellence to Godliness: Zen Meditation for Transformation, Grace Publication, Tiruchirapalli, 2017
5. Manmohan Joshi, Soft Skills, 1<sup>st</sup> Edition, www. bookboon.com
6. Lars Groeger, Jochen Schweitzer, Transformational Leadership and Design Thinking for the Innovative Organization, EGOS paper proposal for Sub-theme 09: (SWG) Leadership in Art, Design and Organization.

### Teaching - Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, Group Discussion

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Understand the basic concepts of Soft Skills and also find the hint of body language.	K3
CO2	Able to write resume and actively participate in the interview	K3
CO3	Give an outline of group discussion and its tactics/ manage the group discuss.	K2
CO4	Solve Quantitative Aptitude related problems	K3
CO5	Compute verbal reasoning problems	K3

**K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, K5 = Evaluate, K6 =Create**

### Mapping Course outcome with PO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3		3		2			
CO2	3		3		2			
CO3	3		3		2			
CO4	3		3		2			
CO5	3		3		2			

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF HUMAN EXCELLENCE

Soft Skill - II

(For those who joined in June 2022 onwards)

<b>Class</b>	<b>: III UG</b>	<b>Part</b>	<b>: IV</b>
<b>Semester</b>	<b>: VI</b>	<b>Hours</b>	<b>: 30</b>
<b>Subject Code</b>	<b>:</b>	<b>Credits</b>	<b>: 2</b>

**Objective:**

This course aims in igniting the minds of the learners with profound knowledge of different skills that will enhance their excellence at working place.

**UNIT 1: (6 Hrs)**

***Leadership, Transformational Leadership and Design Thinking***

Who is a leader? - Difference between leadership and Management-Functions of leadership-Importance of leadership -Effective leadership techniques-Tips to improve leadership- Leadership Style- Design Thinking- Design thinking as a capacity- Linking between Transformational Leadership and Design Thinking.

**UNIT 2: (6 Hrs)**

***Emotional and Motivational Skills***

Meaning of emotion-Difference between feelings and emotions-Components of emotions-Emotional intelligence -Importance of emotional quotient-Different types of emotional intelligence skills- Motivational Skills- Elements of motivation-Types of motivation-Importance of motivation- Motivational skills to develop-Ways to stay motivated.

**UNIT 3: (6 Hrs)**

***Managerial Skills***

Concept of a team-Difference between a team and a group-Importance of teamwork-Benefits of teamwork-Types of teamwork skills- Characteristics of a team-Team Building-Basics of team building-The big five factor of effective team-The secret of building a winning team-Tips for team building-Team building exercises – Self Concepts.

**UNIT 4: (6 Hrs)**

***Stress Management and Time Management:***

Explanation of stress- Positive and negative stressors- Mental impacts of stress-Emotional bearings of stress-Health benefits of managing the stress- SPARKLES formula to reduce stress- Concept of time management: Importance of time management-Skills for time management: Setting goals, Effective planning, Decision making, Delegation of responsibilities, Guarding against time-stealers - Eisenhower matrix to manage task avalanches

**UNIT 5: (6 Hrs)**

**Test of Reasoning:**

Non Verbal reasoning: Completion of series, Sense of directions, blood relations etc.

Recommended Activities

1. <https://teambuildingworld.com/transformational-leadership-activities/>
2. <https://www.sessionlab.com/blog/leadership-activities/>

3. <https://positivepsychology.com/leadership-activities/>
4. <https://getsling.com/blog/leadership-activities/>
5. <https://www.indeed.com/hire/c/info/leadership-activitiy-ideas-management-development>

**Book for Study**

1. Alex.K: Soft Skills: Know Yourself and Know the World, S.Chand Publishing, India, 2012 ISBN:9788121931922, 8121931924
2. Aggarwal,R.S.(2010). A Modern Approach to Verbal and Non-Verbal Reasoning.

**Books for References:**

1. Thamburaj, Francis: Inter-Personal Soft Skills for Professional Excellence, Vijay Nicole Publication, In Print, Chennai, 2019
2. Francis, Peter: Soft Skills and Professional Communication, Tata McGraw Hill Publication, New Delhi, 2012 ISBN-13:9780071078115 \
3. Alphonse, Xavier: We Shall Overcome: A Text Book on Life Coping Skills, ICRDCE Publication, Chennai, 2008
4. Thamburaj, Francis: Journey from Excellence to Godliness: Zen Meditation for Transformation, Grace Publication, Tiruchirapalli, 2017
5. Manmohan Joshi, Soft Skills, 1<sup>st</sup> Edition, bookboon.com

**Teaching - Learning Methods:**

- Lecture Method, ICT, Assignment, Quiz, Group Discussion

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Understand the basic concepts of leadership and distinguish among various Leadership styles.	K3
CO2	Manage the emotions in positive way and motivate towards the desired objects.	K3
CO3	Cooperative with the team members and asses the role and behavioral impact of the team	K2
CO4	Identify the effects of stress in their health and manage the time in a correct sense as a habitual action.	K3
CO5	Compute non-verbal reasoning	K3

**K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze K5 = Evaluate K6 =Create**

**Mapping Course outcome with**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3		3		2			
CO2	3		3		2			
CO3	3		3		2			
CO4	3		3		2			
CO5	3		3		2			