ACADEMIC COUNCIL MEETING

Thursday, 2nd March, 2023

VENUE : 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
2ⁿᵈ March, 2023
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ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.
(Affiliated to Madurai Kamaraj University)
(Reaccredited by NAAC at "A" Grade with a CGPA of 3.66)
KARUMATHUR, MADURAI - 625 514
THE ACADEMIC COUNCIL MEETING
(Thursday, 2ⁿᵈ March, 2023)

| Venue: **PRINCE HALL** | Time: **10.30 a.m.** |

AGENDA

1.0.0 Prayer : **Dr.T.Kala,** Head, Dept. of History

2.0.0 Welcome and Introductory Remarks: **Rev.Dr.Godwin Rufus, SJ,** Principal and Chairperson, Academic Council.

3.0.0 Business brought forward by **Dr.A.Shanmugaraju,** Dean for Academic Affairs

3.0.1 **Dr.A.Shanmugaraju** will bring:

3.0.2 To receive, consider and pass the minutes of the previous meeting of the Academic Council held on 16ᵗʰ March 2022.

3.0.4 That the recommendations of the respective of Boards of Studies, be approved.

3.0.5 That the recommendations to revise syllabi in OBE Format of III & IV semesters for the UG programme from the academic year 2023, be approved.

3.0.6 That the recommendations to revise syllabi in OBE Format of III & IV semesters of the PG programme from the academic year 2023, be approved.

3.0.7 That the recommendation to introduce the New Structure of UG & PG programme based on the guidelines given by TANSCHE and to introduce the same for the students who joined in June 2023 onwards, be approved.

3.0.8 That the recommendation to introduce the New Courses BCA – Computer Application and M.Sc. – Computer Science and to introduce from the academic year 2023-2024, be approved.

(Dr.S.Arul Prasad to second the same)

4.0.0 Business brought forward by the Controller of Examinations.

4.0.1 **Dr.S.Arul Prasad** will move:

4.0.2 That the appointment of question paper setters and examiners for the November 2022, and April 2023 end semester examinations, be approved.

4.0.3 That the publication of results of all the examinations held in April 2022 and November 2022 through online mode, be approved.

5.0.0   Business brought forward by various Boards of Studies

6.0.0   The Board of Studies in **Tamil** at its meeting held on 10.01.2023 passed the following resolutions.

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

6.0.2   **Dr.A.Joseph Charlie Arockia Doss,** Chairperson, Board of Studies in Tamil, will move:

6.0.3   2022-23 ஆம் கல்வியாண்டிலிருந்து பட்ட வகுப்பு பகுதி-1 (தமிழ் ஈராண்டு படிக்கும் மாணவர்களுக்கு) மூன்றாம் பருவம் காப்பியத்தமிழ் தமிழ் 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. **(P.No.28)**

(Dr.S.Jesurajan, to second the same)

7.0.0   The Board of Studies in **English** at its meeting held on 10.01.2023 passed the following resolutions.

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

7.0.2   **Dr.S.Jesurajan,** Chairperson, Board of Studies in English, will move:

7.0.3   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.

7.0.4   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. **(P.No.46)**

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

8.0.0   The Board of Studies in **History** at its meeting held on 10.01.2023 passed the following resolutions.

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

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

8.0.3   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. **(P.No.54)**

8.0.4 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.

(Dr.I.Jeyaraj to second the same)

9.0.0 The Board of Studies in **Economics** at its meeting held on 10.01.2023 passed the following resolutions.

9.0.1 Accordingly these are placed before the Academic Council for approval.

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

9.0.3 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. **(P.No.85)**

9.0.4 That the recommendation of the Board of Studies to modify the existing syllabus for the Allied Papers of the UG Programme, be approved.

9.0.5 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.

9.0.6 That the recommendation of the Board of Studies to continue with the existing syllabus of the PG Programme, be approved.

(Dr.M.George Joseph to second the same)

10.0.0 The Board of Studies in **Philosophy** at its meeting held on 10.01.2023 passed the following resolutions.

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

10.0.2 **Dr.M.George Joseph,** Chairperson, Board of Studies in Philosophy, will move:

10.0.3 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.

10.0.4 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. **(P.No.114)**

10.0.5 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. **(P.No.132)**

10.0.6 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. **(Vol. I, P.No.)**

10.0.7 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.

<center>**(Dr.J.Xavier Adaikalaraj to second the same)**</center>

11.0.0 The Board of Studies in **Mathematics** at its meeting held on 10.01.2023 passed the following resolutions.

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

11.0.2 **Dr.J.Xavier Adaikalaraj,** Chairperson, Board of Studies in Mathematics, will move:

11.0.3 That 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 Application**s in semester IV of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved. **(P.No.148)**

11.0.4 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.

11.0.5 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.**(P.No.171)**

11.0.6 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-4**b***: 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.

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(Dr.K.S.Joseph Wilson to second the same)

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12.0.0 The Board of Studies in **Physics** at its meeting held on 10.01.2023 passed the following resolutions.

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

12.0.2 **Dr.K.S.Joseph Wilson,** Chairperson, Board of Studies in Physics, will move:

12.0.3 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 & Thermodynamic**s in semester IV of the UG Programme and to offer the same for the students who joined in June 2022 onwards, be approved. **(P.No.198)**

12.0.4 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. **(P.No.221)**

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(Dr.S.Rayappan to second the same)

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13.0.0 The Board of Studies in **Chemistry** at its meeting held on 10.01.2023 passed the following resolutions.

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

13.0.2 **Dr.S.Rayappan,** Chairperson, Board of Studies in Chemistry, will move:

13.0.3 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. **(P.No.251)**

13.0.4 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.

13.0.5 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. **(P.No.278)**

13.0.6 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.

13.0.7 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.

(Dr.Ambudoss Arvind to second the same)

14.0.0 The Board of Studies in **Rural Development Science** at its meeting held on 10.01.2023 passed the following resolutions.

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

14.0.2 **Dr.Ambudoss Arvind,** on behalf of **Dr.L.Arockiaraj,** Chairperson, Board of Studies in RDS, will move:

14.0.3 That the recommendation of the Board of Studies to continue with the existing syllabus of the II year UG Programme, be approved.

14.0.4 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.**(P.No.315)**

14.0.5 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.

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(Ms.P.Revathi to second the same)

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15.0.0 The Board of Studies in **Food Science & Technology** at its meeting held on 10.01.2023 passed the following resolutions.

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

15.0.2 **Ms.P.Revathi,** Chairperson, Board of Studies in Food Science & Technology, will move:

15.0.3 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. **(P.No.325)**

15.0.4 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.

15.0.5 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.

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(Dr.M.Karunanidhi to second the same)

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16.0.0 The Board of Studies in **Tamil Literature** at its meeting held on 10.01.2023 passed the following resolutions.

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

16.0.2 **Dr.M.Karunanidhi**, Chairperson, Board of Studies in Tamil Literature, will move:

16.0.3 2022-2023 ஆம் கல்வியாண்டிலிருந்து இரண்டாம் ஆண்டு தமிழ் பட்ட வகுப்பு பயிலும் மாணவர்களுக்குத் தமிழ்பாடத்திட்டக்குழு பரிந்துரைத்த பகுதி-3 மற்றும் பகுதி-4 ஆகியவற்றுக்கான புதிய பாடவரையறைகளை அறிமுகப்படுத்துவது என்ற தீர்மானத்திற்கு ஒப்புதல் பெறுதல். **(P.No.368)**

(Dr.P.Veerasamy, to second the same)

17.0.0 The Board of Studies in **English Literature** at its meetings held on 10.01.2023 passed the following resolutions.

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

17.0.2 **Dr.P.Veerasamy** Chairperson, Board of Studies in English Literature, will move:

17.0.3 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. **(P.No.391)**

17.0.4 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. **(P.No.421)**

17.0.4 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.

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

18.0.0 The Board of Studies in **Commerce with Computer Applications** at its meetings held on 10.01.2023 passed the following resolutions.

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

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

18.0.3 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. **(P.No.457)**

18.0.4 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 IV and **Corporate Accounting – II** is placed in semester V of the UG Programme and to introduce the same for the students who joined in June 2022 onwards, be approved.

18.0.5 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. **(P.No.492)**

18.0.6 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.

18.0.7 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.

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

19.0.0 The Board of Studies in **Commerce** at its meeting held on 10.01.2023 passed the following resolutions.

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

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

19.0.3 That the recommendation of the Board of Studies to propose 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. **(P.No.517)**

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

20.0.0 The Board of Studies in **Business Administration** at its meeting held on 10.01.2023 passed the following resolutions.

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

20.0.2 **Dr.P.Jerlin Rupa,** Chairperson, Board of Studies in Business Administration, will move:

20.0.3 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.

20.0.4 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. **(P.No.546)**

20.0.6 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.

<p align="center">**(Dr.S.Arun Prasad to second the same)**</p>

21.0.0 The Board of Studies in **Information Technology & Management** at its meeting held on 10.01.2023 passed the following resolutions.

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

21.0.2 **Dr.S.Arun Prasad,** Chairperson, Board of Studies in IT&M, will move:

21.0.3 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)**

21.0.4 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.

(Dr.N.Veeraparameswari to second the same)

22.0.0 The Board of Studies in **Physical Education** at its meeting held on 10.01.2023 passed the following resolutions.

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

22.0.2 **Dr.N.Veeraparameswari,** Chairperson, Board of Studies in Physical Education, will move:

22.0.3 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)**

22.0.4 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.

22.0.5 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.

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

23.0.0 The Board of Studies in **Computer Science** at its meeting held on 10.01.2023 passed the following resolutions.

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

23.0.2 **Ms.I.Juliet Shanthi,** Chairperson, Board of Studies in Computer Science, will move:

23.0.3 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. **(P.No.665)**

23.0.4 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 joined in June 2023 onwards, be approved. **(P.No.697)**

24.0.0 The Board of Studies in **Computer Applications** at its meeting held on 10.01.2023 passed the following resolutions.

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

24.0.2 **Ms.I.Juliet Shanthi,** Chairperson, Board of Studies in Computer Applications, will move:

24.0.3 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. **(P.No.683)**

23.0.4 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. **(P.No.717)**

26.0.0 Concluding Remarks : **Rev. Dr. Godwin Rufus, S.J.,**
Principal and Chairperson, Academic Council.

27.0.0 Concluding Prayer   : **Dr.I.Pradeepa**
Vice Principal (Shift II)

PRINCIPAL & CHAIRPERSON
ACADEMIC COUNCIL

MINUTES OF THE PREVIOUS ACADEMIC COUNCIL MEETING
held on 16th March, 2022

MINUTES

MEETING OF THE ACADEMIC COUNCIL, 16th March (Wednesday), 2022

1.0.0 **Preliminaries:** The Meeting of the AAC Academic Council was held in Fr Prince Hall on 16.03.2022 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. The Academic Council Meeting commenced with the invocation by Mr.J.Keba Immanuvel, Vice Principal (Shift II).

MEMBERS PRESENT

S.No.	Name of the Member	Office / Department
1.	Rev.Dr.Godwin Rufus, SJ	Principal & Chairperson
2.	Dr.A.Shanmugaraju	Dean for Academic Affairs, Convenor
3.	Rev.Dr.John Pragasam, SJ	Rector
4.	Dr.M.Thangaraj MKU Nominee	Professor & Head Department of Computer Science School of Information Technology Madurai Kamaraj University Madurai – 625 021.
5.	Dr.D.Swamikannan MKU Nominee	Professor & Head Chairperson Department of Environmental Economics School of Economics Madurai Kamaraj University Madurai – 625 021.
6.	Dr.S.Muralisankar MKU Nominee	Professor Department of Mathematics School of Mathematics Madurai Kamaraj University Madurai – 625 021.
7.	Dr.A.Ramanathan GB Nominee	Professor School of Agriculture & Animal Husbandry Gandhigram Rural Institute – Deemed University Gandhigram Dindigul – 625 302.

8.	Dr.R.Nimma Elizabeth GB Nominee	Associate Professor & Head Dean of Academic Lady Doak College Madurai – 625002.
9.	Dr.R.Albert Christopher Dhas GB Nominee	Director Management Courses The American College Madurai – 625002.
10.	Dr.A.Sundararaj	Deputy Principal (Shift II)
11.	Rev.Dr.M.Anbarasu, SJ	Vice Principal (Shift I)
12.	Dr.A.Duraisingam	Vice Principal (Shift I)
13.	Rev.Fr.S.Jayaseelan, SJ	Vice Principal (Shift II)
14.	Mr.J.Keba Immanuvel	Vice Principal (Shift II)
15.	Dr.I.Pradeepa	Vice Principal (Shift II)
16.	Dr. Ambudoss Arvind	Dean-Research
17.	Dr.S.Arul Prasad	Controller of Examinations
18.	Dr.D.Antony Singh Dhas	Coordinator-IQAC
19.	Dr.A.Joseph Charlie Arockia Doss	Tamil
20.	Dr.S.Jesurajan	English
21.	Dr.J.Martin	History
22.	Dr.I.Jeyaraj	Economics
23.	Dr.M.George Joseph	Philosophy
24.	Dr.J.Xavier Adaikalaraj	Mathematics
25.	Dr.K.S.Joseph Wilson	Physics
26.	Dr.S.Rayappan	Chemistry
27.	Dr.L.Arockia Raj	RDS
28.	Ms.P.Revathi	Food Science & Technology
29.	Dr.M.Karunanidhi	Tamil
30.	Dr.P.Veerasamy	English Literature
31.	Dr.S.Rajeswari	Commerce
32.	Dr.P.Jerlin Rupa	Business Administration
33.	Dr.R.Kadher Farook	I.T. & Management
34.	Dr.N.Veeraparameswari	Physical Education
35.	Ms.I.Juliet Shanthi	Computer Science & MCA

36.	Rev.Dr.Vincent Sekhar, SJ	Human Excellence
37.	Dr.G.Gurusamy	Dean-Student, Extension

Members absent with apology

S.No.	Name of the Member	Office / Department
1.	Rev.Dr.V.Gilburt Camillus, SJ	Secretary
2.	Dr.Ponmuthuramalingam	Joint Director of Collegiate Education Madurai Region Palam Station Road, Sellur Madurai – 625 002.
3.	Rev.Fr.Dr.R.Essac	Principal Anugraha College Nochoidaipatty, Dindigul.
4.	Mr.L.Ahamed Riyaz	Manager HR HCL Technologies ELCOT IT Park Near Pandi Kovil Madurai – 625 020.

2.0.0 **Rev.Dr.Godwin Rufus, SJ,** Principal and Chairperson welcomed all the members. He appreciated the board for taking initiative for updating the syllabi even in the pandemic period. He also added that the change in education system of any nation gave scope to the overall development of the nation.

3.0.0 Business brought forward by **Dr.A.Shanmugaraju,** Dean for Academic Affairs

3.0.1 The minutes of the previous meeting of the Academic Council held on 26th February 2021 was received, considered and passed.

3.0.2 **Dr.A.Shanmugaraju** moved the following resolutions.

3.0.3 That the appointment of subject experts for the respective board of studies for the period 2021-2024, for approval.

3.0.4 That the recommendations of the respective of Boards of studies for approval.

3.0.5 That the recommendation to introduce the revised structure with OBE Format for the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

3.0.6 That the recommendation to introduce Soft Skill course to only III year students in semesters V & VI instead of the present system of Soft Skill course in all six semesters

and to introduce the same for the students who join in June 2022 onwards, be approved, for approval.

3.0.7   That the recommendations to revise syllabi in OBE Format of I & II semesters for the UG programme from the academic year 2022, for approval.

3.0.8   That the recommendation to introduce the revised structure with OBE Format for the PG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

3.0.9   That the recommendations to revise syllabi in OBE Format of I & II semesters of the PG programme from the academic year 2022, for approval.

4.0.0   **Dr.S.Arul Prasad**, the Controller of Examinations, seconded the same. The above recommendations were passed without amendments.

4.0.1   Business brought forward by the Controller of Examinations.

4.0.2   **Dr.S.Arul Prasad** the Controller of Examinations, moved the following resolutions:

4.0.3   That the appointment of question paper setters and examiners for the November 2021, and April 2022 end semester examinations, for approval.

4.0.4   That the publication of results of all the examinations held in April 2021 and November 2021 through online mode, for approval.

4.0.5   Dr.A.Joseph Charlie Arockia Doss seconded the same and the resolutions were approved without amendments.

5.0.0   **Dr.A.Joseph Charlie Arockia Doss,** Chairperson, Board of Studies in Tamil moved the following resolutions.

5.0.1   2022-23 ஆம் கல்வியாண்டிலிருந்து பட்ட வகுப்பு பகுதி-1 (தமிழ் ஓராண்டு படிக்கும் மாணவர்களுக்கு) முதல்பருவம் தொடர்புத் தமிழ்தாள் - I மற்றும் இரண்டாம் பருவம் தொடர்புத் தமிழ்தாள் - II ஆகிய இரண்டு தாள்களுக்குரிய புதிய பாடவரையறைகளை அறிமுகப்படுத்துவது என்ற தீர்மானத்திற்கு ஒப்புதல் பெறுதல்.

5.0.2   2022-23 ஆம் கல்வியாண்டிலிருந்து பட்ட வகுப்பு பகுதி-1 (தமிழ் ஈராண்டு படிக்கும் மாணவர்களுக்கு) முதல்பருவம் வளர் தமிழ் மற்றும் இரண்டாம் பருவம் தெய்வத்தமிழ் ஆகிய இரண்டு தாள்களுக்குரிய புதிய பாடவரையறைகளை அறிமுகப்படுத்துவது என்ற தீர்மானத்திற்கு ஒப்புதல் பெறுதல்.

5.0.3   Dr.S.Jesurajan seconded the same and the resolutions were approved without amendments.

6.0.0   **Dr.S.Jesurajan,** Chairperson, Board of Studies in English moved the following resolutions.

6.0.1   That the recommendation of the Board of Studies to continue the existing Part II English Syllabi for both Streams A & B, in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

6.0.2 That the recommendation of the Board of Studies to continue the existing question paper pattern for both Streams A & B, for approval.

6.0.3 That the recommendation of the Board of Studies to introduce New Syllabus for **Bridge Course in English** of the UG Programme and to introduce the same for the students who join in June 2021 onwards, for ratification.

6.0.4 That the recommendation of the Board of Studies to revise syllabi of Career Oriented Courses – **Media Reporting** and **English Proficiency for Career Prospects** of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

6.0.5 Dr.J.Martin, seconded the same.

6.0.6 Dr.D.Swamikannan, MKU Nominee sought clarification on the evaluation pattern of Bridge course.

6.0.7 Dr.S.Jesurajan, Head, Department of English replied that the evaluation method is uniform for all the courses and it was fixed as internal 50 marks and external 50 marks.

6.0.8 Dr.M.Thangaraj, Head, Department of CS and Dr.D.Swamikannan informed that any syllabus could be within the framework of TANSCHE.

6.0.9 The resolutions were approved without amendments.

7.0.0 **Dr.J.Martin,** Chairperson, Board of Studies in History moved the following resolutions.

7.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

7.0.2 That the recommendation of the Board of Studies to revise and move Core 8 : History of Madurai in semester V to semester I and History of India - I in Semester I to semester II and 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 join in June 2022 onwards, for approval.

7.0.3 Dr.I.Jeyaraj seconded the same.

7.0.4 Dr.S.Jesurajan sought clarification on presenting objectives in the OBE syllabus and it was clarified that any course needed objectives so that the outcome could be attained.

7.0.5 Dr.M.Thangaraj suggested giving vision and mission in the syllabus instead of PSO & PO, and it was answered by Dr.M.Geroge Joseph that the PSO_S & PO_S are the reflections of vision and mission.

7.0.6 Dr.D.Swamikannan sought clarification on the credit allocation of communication skills and it was clarified by Dr.A.Shanmugaraju, Dean for Academic Affairs that the course would have one credit at the end of I year in the general structure.

7.0.7 The members of the board Dr.D.Swamikannan & Dr.M.George Joseph suggested to follow possible uniformity in credit for core, core electives in all the programmes.

7.0.8 The resolutions were approved without amendments.

8.0.0 **Dr.I.Jeyaraj,** Chairperson, Board of Studies in Economics moved the following resolutions.

8.0.1 That the recommendation of the Board of Studies to revise the courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

8.0.2 That the recommendation of the Board of Studies to revise the Carrier Oriented Course 'Principles of Marketing & International Marketing (Theory and Practical) and to introduce the same for the students who join in June 2022 onwards, for approval.

8.0.3 That the recommendation of the Board of Studies to continue with the existing OBE structure and syllabus of the PG Programme, for approval.

8.0.4 **Dr.M.George Joseph** seconded the same.

8.0.5 Dr.D.Swamikannan suggested that the course 'Demography' offered as core could be offered as core elective.

8.0.6 Dr.I.Jeyaraj responded that in many reputed colleges the course 'Demography' is offered as Core.

8.0.7 Dr.D.Swamikannan suggested changing the content of the paper "Elements of Indian Economy" which seems to be very simple for the economics major. Dr.I.Jeyaraj explained that the paper was given as a non-major elective for other major students.

8.0.8 Dr.M.Thangaraj opined that the self-learning courses could be increased and also the MOOC/SWAYAM courses could also be added to promote the ICT kind of learning. He also recommended to give web reference, e-content, blogs and NPTEL sources in the syllabus of every course. Dr.A.Shanmugaraju clarified that the MOOC/SWAYAM courses are already introduced as Self Learning Courses.

8.0.9 Dr.R.Albert Christopher Dhas asked the reason for keeping many management papers in the economics syllabus. Dr.I.Jeyaraj answered that it was given as per the requirement of NAAC and to make students employable and skill oriented.

8.1.0 Dr.D.Swamikannan recommended to add the paper "Behavioural Economics" to the third-year economics syllabus.

8.1.1 After discussions the resolutions were approved with amendments.

9.0.0 **Dr.M.George Joseph,** Chairperson, Board of Studies in Philosophy moved the following resolutions.

9.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

9.0.2 That the recommendation of the Board of Studies to introduce Allied -2 'Subaltern and Feminist Philosophy' in the place of 'Social Psychology' in Semester II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

9.0.3 That the recommendation of the Board of Studies to introduce 'Sanskrit' (Language Skills) instead of 'Communication Skills' in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

9.0.4 That the recommendation of the Board of Studies to revise Core, Core Elective, Non-Major Elective in OBE format in Semesters I & II of the PG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

9.0.5 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 join in June 2022 onwards, for approval.

9.0.6 Dr.J.Xavier Adaikalaraj seconded the same and the resolutions were approved without amendments.

10.0.0 **Dr.J.Xavier Adaikalaraj,** Chairperson, Board of Studies in Mathematics moved the following resolutions.

10.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

10.0.2 That the recommendation of the Board of Studies to revise Core, Core Elective, Non-Major Elective under OBE format in Semesters I & II of the PG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

10.0.3 That the recommendation of the Board of studies to revise question paper pattern for Internal of the UG & PG Programmes and to introduce the same for the students who join in June 2022 onwards, for approval.

10.0.4 That the recommendation of the Board of Studies to revise the existing two COC courses 'Mathematics for Competitive Examinations' and 'Resource Management Techniques' of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

10.0.5 That the recommendation of the Board of Studies to introduce two new Certificate Courses for PG and to introduce the same for the students who join in June 2022 onwards, for approval.

10.0.6 Dr.K.S.Joseph Wilson seconded the same.

10.0.7 Dr.R.Christopher Dhas sought clarification on mentioning the units of the books in syllabus. Dr.J.Xavier Adaikalaraj replied that it was given for setting questions with in the syllabus.

10.0.8 Dr.M.Thangaraj informed about Education 4.0 and he added that UGC would soon ask to include the paper "AI" as a skill-based elective so as to keep a techy environment.

10.0.9 Dr.A.Shanmugaraju requested the Heads of the department to encourage PG students to take a certificate course as the Maths department initiated two certificate courses, in the next academic year.

10.1.0 After the discussions the resolutions were approved without amendments.

11.0.0 **Dr.K.S.Joseph Wilson,** Chairperson, Board of Studies in Physics moved the following resolutions.

11.0.1 That the recommendation of the Board of Studies to revise Core courses in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

11.0.2 That the recommendation of the Board of Studies to revise and rename the title of Allied Physics – I in semester I and Allied Physics – II in semester II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

11.0.3 That the recommendation of the Board of Studies to introduce an additional Core Elective 1C : 'Optoelectronics' in Semester VI of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

11.0.4 That the recommendation of the Board of Studies to revise Core courses under OBE format in Semesters I & II of the PG Programme and to introduce the same for the students who join in June 2020 onwards, for ratification.

11.0.5 That the recommendation of the Board of Studies to introduce Core 2 : 'Classical Mechanics' in the place of 'Classical and Statistical Mechanics' in Semester I and an additional Core Elective "Thermodynamics and Statistical Physics" of the PG Programme, and to replace Core Elective "Microprocessor" with "Microprocessor and Microcontroller" and to introduce the same for the students who join in June 2022 onwards, for approval.

11.0.6 Dr.S.Rayappan seconded the same.

11.0.8 Dr.R.Nimma Elizabeth, GB Nominee suggested the text book by Holliday Resnick-for the particular course. Dr.K.S.Joseph Wilson, Head, Department of Physics replied that the book authored by Murugesan was accepted by BOS members and so it was given as textbook for 1st year students, and that book by Resnick was given in the reference.

11.0.9 Dr.R.Nimma Elizabeth sought clarification on the lab experiments and asked to conduct experiments on micro controller.

11.1.0 She made some suggestions in the papers "Energy and Environmental Physics" to include super capacitors. Also in Applied electronics, she suggested to include micro controller instead of microprocessor.

11.1.1 Dr.K.S.Joseph Wilson, Head of the Department of Physics welcomed the suggestions and said that a combination of the topics was present in an elective paper.

11.1.2 After the discussions the resolutions were approved with amendments.

12.0.0 **Dr.S.Rayappan,** Chairperson, Board of Studies in Chemistry moved the following resolutions.

12.0.1 That the recommendation of the Board of Studies to revise Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

12.0.2 That the recommendation of the Board of Studies to bifurcate Core Lab III - Organic Analysis and Estimation into two as Core Lab III – Organic Analysis and Core Lab IV – Organic Estimation and Preparation in semester V of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

12.0.3 That the recommendation of the Board of Studies to combine Core Lab – IV 'Gravimetry and Preparation' in semesters V & VI and to introduce as Core Lab – V in Semester VI of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

12.0.4 That the recommendation of the Board of Studies to revise the structure of curriculum in OBE Format for the PG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

12.0.5 That the recommendation of the Board of Studies to revise Core, Core Elective, Non-Major Elective under OBE format in Semesters I & II of the PG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

12.0.6 Dr.L.Arockiaraj seconded the same.

12.0.7 Dr. Thangaraj appreciated the college for giving Internships for the final year students and clarified about the credit allotment for the internship courses.

12.0.8 Dr.R.Nimma Elizabeth suggested changing the order of units for the course "Chemistry of Materials".

12.0.9 The resolutions were approved with amendments.

13.0.0 **Dr.L.Arockiaraj,** Chairperson, Board of Studies in RDS moved the following resolutions.

13.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, be approved, for approval.

13.0.2 That the recommendation of the Board of Studies to revise courses in Core, Core Electives and Non-Major Elective in Semesters I & II of the PG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

13.0.3 That the recommendation of the Board of Studies to move Core 2 : 'Entrepreneurship Development' in semester I to semester III and to introduce Core 2 : General Microbiology (Theory and Practical) in semester I and 'Farm Business Management' in the place of 'IRD Practical – 4' in Semester IV of the PG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

13.0.4 Ms.P.Revathi seconded the same.

13.0.5 Dr.L.Arockiaraj, HoD, Department of RDS asked the external members for guidance in getting equivalence for M.Sc, Dairy Science Programme as M.Sc. RDS.

13.0.6 The resolutions were approved without amendments.

14.0.0 **Ms.P.Revathi,** Chairperson, Board of Studies in Food Science & Technology moved the following resolutions.

14.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

14.0.2 That the recommendation of the Board of Studies to introduce Core 3 : 'Nutritional Biochemistry' in the place of 'Introduction to Biochemistry' and Allied – 2 'Fast Foods and Snacks Technology' (Theory & Practical) in the place of 'Fast Foods and Catering Services' (Theory & Practical) in Semester II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

14.0.3 That the recommendation of the Board of Studies to change nomenclature of Core Lab 2: 'Biochemistry and Food Technology' as "Nutritional Biochemistry and Food Technology" and core paper- 4 "Introduction to Food Technology" as "Fundamentals of Food Technology" in Semester II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

14.0.4 That the recommendation of the Board of Studies to rename COC programme 'Dietetics & Diet Counselling" as "Dietetics" of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

14.0.5 Mr.M.Karunanidhi, seconded the same and the resolutions were approved without amendments.

15.0.0 **Mr.M.Karunanidhi,** Chairperson, Board of Studies in Tamil Literature moved the following resolutions.

15.0.1 2022-2023 ஆம் கல்வியாண்டிலிருந்து முதலாம் ஆண்டு தமிழ் பட்ட வகுப்பு பயிலும் மாணவர்களுக்குத் தமிழ்பாடத்திட்டக்குழு பரிந்துரைத்த புதிய பாடவரையறைகளை அறிமுகப்படுத்துவது என்ற தீர்மானத்திற்கு ஒப்புதல் பெறுதல்.

15.0.2 Dr.P.Veerasamy seconded the same and the resolutions were approved without amendments.

16.0.0 **Dr.P.Veerasamy**, Chairperson, Board of Studies in English Literature moved the following resolutions.

16.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

16.0.2 That the recommendation of the Board of Studies to introduce one more Core Elective 1b: **Short Stories in English Translation - I** in Semester III and Core Elective 2b : **Short Stories in English Translation - II** in Semester IV of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

16.0.3 That the recommendation of the Board of Studies to revise the syllabus in Core, Core Elective, Non-Major Elective under OBE format in Semesters I & II of the PG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

16.0.4 That the recommendation of the Board of Studies to introduce additional Core Elective 1b: **An Introduction to Film Studies** in Semester I, Core Elective 2b : **An Outline History of English Language** in Semester II, Core Elective 3b: **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 join in June 2022 onwards, for approval.

16.0.5 Ms.S.Rajeswari seconded the same.

16.0.6 Dr.D.Antony Singh Dhas asked about the details of the novels given in the syllabus of English literature. Dr.P.Veersamy, HOD, Dept of English said that there were more than two novels papers given in the syllabus.

16.0.7 Dr.D.Antony Singh Dhas suggested that equal duration and equal weightage for every unit could be followed.

16.0.8 Dr.S.Jesuarajan, HOD, Department of English asked to have the "mass communication" paper as skill-based elective since it was given as skill-based paper in the English language syllabus.

16.9.0 After the discussions the resolutions were approved with amendments.

17.0.0 **Dr.S.Rajeswari,** Chairperson, Board of Studies in Commerce with Computer Applications moved the following resolutions.

17.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied courses in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

17.0.2 That the recommendation of the Board of Studies to introduce Core 2: 'Computer Applications in Business' in the place of 'Computer Fundamentals' and Allied -1 : 'Business Economics' in the place of 'Fundamentals of Commerce' in Semester I of the UG Programme and to introduce the same for the students who join in June 2022 onwards, be approved.

17.0.3 That the recommendation of the Board of Studies to introduce courses in Core, Core Elective and Non-Major Elective under OBE format in Semesters I & II of the PG Programme (M.Com) and to introduce the same for the students who join in June 2021 onwards, be ratified. **(Vol. II, P.No.477)**

17.0.4 That the recommendation of the Board of Studies to introduce courses in Core, and Core Elective under OBE format in Semesters III & IV of the PG Programme(M.Com) and to introduce the same for the students who join in June 2021 onwards, be ratified.

17.0.5 That the recommendation of the Board of Studies to introduce the question paper pattern in OBE format and to introduce the same for the students who join in June 2021 onwards, be ratified.

17.0.6 Dr.G.Gurusamy seconded the same.

17.0.7 Fr. Principal, Chairperson clarified whether the paper "Fundamentals of Commerce" could be approved for the first-year students. Dr.S.Rajeswari told that the reasons for having Business Economics in the I year instead of that paper.

17.0.8 Dr.I.Jeyaraj sought clarification on the units of the "Business Economics" paper and suggested including the Cost curve concept in any one of the units.

17.0.9 The board recommended changing the title of the paper "Commerce for NET/SET" since it was not proper.

17.1.0 Dr.S.Jesurajan, HOD, Department of English asked to follow uniformity in giving headings as it was mentioned PG Department in some program and Department name in some programs.

17.1.1 After the discussions and the resolutions were approved with amendments.

18.0.0 **Dr.S.Rajeswari,** Chairperson, Board of Studies in Commerce for the new programme B.Com moved the following resolution.

18.0.1 That the recommendation of the Board of Studies to propose courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

18.0.2 Dr.P.Jerlin Rupa seconded the same and the resolutions were approved without amendments.

19.0.0 **Dr.P.Jerlin Rupa,** Chairperson, Board of Studies in Business Administration moved the following resolutions.

19.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

19.0.2 Dr.R.Albert Christopher Dhas, GB Nominee suggested changing the nomenclature of the paper "Environment Management "as it gave a different meaning. He also suggested to change it as "Business environmental Management".

19.0.2 Mr.R.Kadher Farook seconded the same and the resolutions were approved without amendments.

20.0.0 **Mr.R.Kadher Farook,** Chairperson, Board of Studies in IT&M moved the following resolution.

20.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

20.0.2 Dr.N.Veeraparameswari seconded the same and the resolutions were approved without amendments.

21.0.0 **Dr.N.Veeraparameswari,** Chairperson, Board of Studies in Physical Education moved the following resolution.

21.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters I & II of the UG Programme and to introduce Core 1: 'Theories of Games – I (Kabaddi & Badminton)' in the place of 'Theories of Game – I (Kabaddi and Volleyball' and Allied -1 : 'Foundation of Physical Education' in the place of 'Fundamentals of Physical Education' in Semester I and to introduce Core 2 : Theories of Games – II

(Basketball and Volleyball) in the place of 'Theories of Game - II (Badminton and Basketball) in semester II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

21.0.2 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.

21.0.3 Ms.I.Juliet Shanthi seconded the same.

21.0.4 Dr.M.Geroge Joseph, Head Department of Philosophy suggested including rural games in the Physical Education curriculum.

21.0.5 Dr.M.Thangaraj suggested allotting more credits for project papers.

21.0.6 After the discussions the resolutions were approved without amendments.

22.0.0 **Ms.I.Juliet Shanthi,** Chairperson, Board of Studies in Computer Science moved the following resolutions.

22.0.1 That the recommendation of the Board of Studies to revise courses in Core and Allied in Semesters I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

22.0.2 That the recommendation of the Board of Studies to introduce Core 2: 'PC Hardware and Troubleshooting' in the place of 'Foundation of Computer Science' and Allied -1 : 'Digital Computer and Fundamentals' in the place of 'Digital Principles' in Semester I of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

22.0.3 Dr.D.Antony Singh Dhas seconded the same and the resolutions were approved without amendments.

23.0.0 **Ms.I.Juliet Shanthi,** Chairperson, Board of Studies in Computer Applications moved the following resolutions.

23.0.1 That the recommendation of the Board of Studies to revise courses in Core, Core Elective and Non-Major Elective in Semesters I & II of the PG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

23.0.2 That the recommendation of the Board of Studies to continue the existing syllabus of Computer Literacy courses of the UG programme and to introduce the same for the students who join in June 2022 onwards, for approval.

23.0.3 Dr.A.Shanmugaraju seconded the same.

23.0.4 Dr.D.Antony Singh Dhas, asked the reason for keeping the paper "Principles of Management" in MCA Curriculum.

23.0.5 Mrs.I.Juliet Shanthi, Head of the Department replied that it was kept as per AICTE norms.

23.0.6 After the discussion the resolutions were approved without amendments.

24.0.0 **Dr.A.Shanmugaraju,** Dean for Academic Affairs, moved the following resolution.

24.0.1 That the recommendation of the Board of Studies to revise Non Major Elective : 'Introduction to Gender Studies' in Semester III of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

24.0.2 Dr.A.Sundararaj seconded the same and the resolution was passed.

25.0.0 **Rev.Dr.Sekhar B.Vincent,** Head, Dept. of Human Excellence moved the following resolution.

25.0.1 That the recommendation of the Board of Studies to introduce Soft Skills Paper I & II to only the III UG students for two hours in each semester (V & VI) with the maximum of two credits who join in June 2022 onwards, for approval.

25.0.2 That the recommendation of Board of Studies to revise the syllabus of Communication Skill course in Semester I & II of the UG Programme and to introduce the same for the students who join in June 2022 onwards, for approval.

25.0.2 Dr.A.Sundararaj seconded the same.

25.0.3 Dr.M.Geroge Joseph sought clarification on credits of Soft Skill papers and suggested semester wise exams for these courses.

25.0.4 Fr.Rector appreciated the suggestion to include one credit each in semester V and VI.

25.0.4 After the discussion the resolution was 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.

27.0.0 The meeting came to a conclusion with the prayer by **Rev.Dr.Sekhar B.Vincent,** Head, Department of Human Excellence.

PRINCIPAL & CHAIRPERSON
ACADEMIC COUNCIL

ANNEXURES

DEPARTMENT OF TAMIL

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி), கருமாத்தூர் – 625 514

தமிழ்த்துறை
விருப்பநிலைத் தேர்வுபாடமுறை
பகுதி ஒன்று–பொதுத்தமிழ்
பாடஅமைப்பு
2022-2023

பாடக்குறியீட்டு எண்	வகுப்பு	தாள்	மணி	மதிப்புப்புள்ளி
முதற் பருவம்				
22UTML11	இளமறிவியல் - ஊரகவியல், உணவுஅறிவியல் மற்றும் தொழில்நுட்பவியல், வணிகவியல், வணிக மேலாண்மையியல், தகவல் தொழில்நுட்பம் மற்றும் மேலாண்மையியல், கணினியியல்	தொடர்புத்தமிழ் -1	6	4
இரண்டாம் பருவம்				
22UTML22	இளமறிவியல் - ஊரகவியல், உணவு அறிவியல் மற்றும் தொழில்நுட்பவியல், வணிகவியல், வணிக மேலாண்மையியல், தகவல் தொழில்நுட்பம் மற்றும் மேலாண்மையியல், கணினியியல்	தொடர்புத்தமிழ்-2	6	4

	வகுப்பு	தாள்	மணி	மதிப்புப்புள்ளி
முதற் பருவம்				
22UTAL11	இளங்கலை— தமிழ், ஆங்கிலம், வரலாறு, பொருளாதாரம், மெய்யியல் இளமறிவியல் – கணிதம், இயற்பியல், வேதியியல், உடற்கல்வியியல்	வளர்தமிழ்	6	4
இரண்டாம் பருவம்				
	வகுப்பு	தாள்	மணி	மதிப்புப்புள்ளி
22UTAL22	இளங்கலை - தமிழ், ஆங்கிலம், வரலாறு, பொருளாதாரம், மெய்யியல் இளமறிவியல் – கணிதம், இயற்பியல், வேதியியல், உடற்கல்வியியல்	தெய்வத்தமிழ்	6	4
மூன்றாம் பருவம்				
	வகுப்பு	தாள்	மணி	மதிப்புப்புள்ளி
22UTAL33	இளங்கலை - ஆங்கிலம், வரலாறு, மெய்யியல், பொருளாதாரம்	காப்பியத்தமிழ்	6	4
	இளமறிவியல் - கணிதம், இயற்பியல், வேதியியல், உடற்கல்வியியல்	,,	6	4
நான்காம் பருவம்				
	வகுப்பு	தாள்	மணி	மதிப்புப்புள்ளி
22UTAL44	இளங்கலை - ஆங்கிலம், வரலாறு, மெய்யியல், பொருளாதாரம்	சங்கத்தமிழ்	6	4
	இளமறிவியல் - கணிதம், இயற்பியல், வேதியியல், உடற்கல்வியியல்	,,	6	4

பகுதி – 4 பாட அமைப்பு				
	மூன்றாம் பருவம்			
	பகுதி – 4	தாள்	மணி	மதிப்புப்புள்ளி
22UTMN13 **22UTMM13**		அடிப்படைத்தமிழ் - 1 / சிறப்புத்தமிழ் - 1	3	2
	நான்காம் பருவம்			
	பகுதி – 4	தாள்	மணி	மதிப்புப்புள்ளி
22UTMN24 **22UTMM24**		அடிப்படைத்தமிழ் - 2 / சிறப்புத்தமிழ் - 2	3	2

வகுப்பு : பி.ஏ.,பி.எஸ்சி., இரண்டாமாண்டு	பாடம்	: காப்பியத்தமிழ்
பருவம் : மூன்றாம் பருவம்	நேரம்	: 90 மணிகள்
குறியீடு : **22UTAL33**	மதிப்புப்புள்ளி	: 4

(2022 - 2023ஆம் கல்வியாண்டு முதல் சேரும் மாணவர்களுக்குரியது)
பகுதி-I பொதுத்தமிழ் - காப்பியத்தமிழ்
விளைவுஅடிப்படையிலான கல்விப் பாடத்திட்டம்
(Outcome Based Education)
காப்பியத்தமிழ்ப் பாடவரையறை
(2023-2024, 2024-2025, 2025-2026)

நோக்கம்
1. தமிழ்க் காப்பிய இலக்கிய வரலாற்றுக் குறிப்புகளைக் காலவரிசைப்படி எடுத்துரைத்தல்.
2. காப்பியம் சுட்டும் அற கருத்துகளை இன்றைய சமூக, அரசியல், பொருளாதாரப் பின்புலத்தில் பகுத்துப்பார்க்கும் நோக்கில் கற்பித்தல்.
3. மொழித்திறனை மேம்படுத்த வழிகாட்டுதல்.
4. கவிதை, உரைநடைநூல்கள் எழுதப் பயிற்றுவித்தல்.
5. போட்டித் தேர்வுகளில் சாதிப்பதற்குத் தேவையான தகவல்களைச் சுட்டிக்காட்டுதல்.

அலகு -1 செய்யுள்   (30 மணிகள்)

- இளங்கோவடிகள் - சிலப்பதிகாரம்,புகார் காண்டம் - கனாத்திறம் உரைத்தகாதை   (75 வரிகள்)

- சீத்தலைசாத்தனார் - மணிமேகலை,பாத்திரம் பெற்றகாதை   (15 பாடல்கள்)
- திருத்தக்கத்தேவர் - சீவசிந்தாமணி,விமலையார் இலம்பகம்,   (15 பாடல்கள்)
- கம்பர் - கம்பராமாயணம், யுத்தகாண்டம் - இரணியன் வதைப்படலம்   (15 பாடல்கள்)

- சேக்கிழார் - பெரியபுராணம், முதற்காண்டம்,திருமலைச்சருக்கம் - தடுத்தாட்கொண்டபுராணம்   (15 பாடல்கள்)

- வீரமாமுனிவர் - தேம்பாவணி, இரண்டாம் காண்டம் - சீனயிமாமலைகாண்படலம்   (15 பாடல்கள்)

- உமறுப்புலவர் - சீறாப்புராணம், -நுபுவத்துக்காண்டம், உடும்புபேசியபடலம்   (15 பாடல்கள்)

- புலவர்குழந்தை - இராவணகாவியம், தமிழகக்காண்டம் -கடல்கோட் படலம   (15 பாடல்கள்)

அலகு - 2 காப்பிய இலக்கியவரலாறு   (15 மணிகள்)
காப்பியம் விளக்கம் - காப்பிய வகைகள் - ஐம்பெரும் காப்பியம் - ஐஞ்சிறுகாப்பியம் - பிறகாப்பியங்கள் - இக்காலகாப்பியங்களும் போக்குகளும்

அலகு - 3 யாப்பும் அணியும்   (15 மணிகள்)
யாப்பிலக்கணம் பற்றிஅறிதல் - யாப்பிலக்கண பயன்பாடுகள் பற்றிக் குறிப்பிடுதல் - யாப்பிலக்கண நூல்கள் - யாப்பு உறுப்புகள் - பாவகைகள் - அணி இலக்கணம் பற்றி அறிதல்

- பயன்பாடுகள் பற்றிக் குறிப்பிடுதல் - இலக்கியத்தில் அணியின் முக்கியத்துவம் -அணி இலக்கண நூல்கள் - அணிகள் வகைகள் (உவமை- உருவகம் - வேற்றுமை- பிறிதுமொழிதல் - தற்குறிப்பேற்றம் - பின்வருநிலை) இன்றைய கவிதைகளில் பயின்று வரும் அணிகளைக் கண்டறிய பயிற்சியளித்தல்.

அலகு - 4 உரைநடை   - (பத்துக்கட்டுரைகள்)   (15 மணிகள்)

அலகு - 5 புதினம்   - இரா. செல்வம் - பனையடி   (15 மணிகள்)

பாட நூல்கள்

1. முனைவர் ஆ. ஜோசப் சார்லி ஆதாஸ் (தொகுப்பாசிரியர்) **காப்பியத் தமிழ்**, தமிழ்த்துறை வெளியீடு, அருள் ஆனந்தர் கல்லூரி, கருமாத்தூர் -625 514. முதல் பதிப்பு, ஜூன் 2023.

2. **இரா. செல்வம்,பனையடி,** நியூசெஞ்சுரிபுக் ஹவுஸ் வெளியீடு, சென்னை, முதல் பதிப்பு- அக்டோபர் 2021.

பார்வை நூல்கள்

1. **இளங்கோவடிகள்** - **சிலப்பதிகாரம்,** உரையாசிரியர் ந.மு.வேங்கடசாமி நாட்டார், திருநெல்வேலி, தென்னிந்திய சைவசித்தாந்த நூற்பதிப்புக்கழகம் லிமிடெட். 154, டி.டி.கே.சாலை, ஜூலை (இரண்டாம் பதிப்பு), 1999, சென்னை— 600 018.

2. **சீத்தலைச்சாத்தனார்** - **மணிமேகலை,** உரையாசிரியர் பேராசிரியர் ஜெ.ஸ்ரீசந்திரன், வார்த்தமானன் பதிப்பகம், டிசம்பர்- 2000 (இரண்டாம் பதிப்பு), சென்னை— 17.

3. **திருத்தக்கத்தேவர்- சீவகசிந்தாமணி,** உரையாசிரியா ்டாக்டர் துரை இராசாராம், முல்லைநிலையம், மறுபதிப்பு 2010, சென்னை-14.

4. **சேக்கிழார் - திருத்தொண்டர் புராணம் என்னும் பெரியபுராணம்,** உரையாசிரியர்: புலவர் பி.ரா.நடராஜன், உமாபதிப்பகம், மூன்றாம் பதிப்பு - 2012, சென்னை-01.

5. **கம்பர் - கம்பராமாயணம்,** உரையாசிரியர் அனுஜன், யுத்தகாண்டம், ந்ர்மதா பதிப்பகம். முதற்பதிப்பு - 1999, சென்னை-17.

6. **சீறாப்புராணம் - உமறுப்புலவர் ,**உரையாசிரியர் மகாமதிசதாவதானி, கே.பி.செய்குத்தம்பிப் பாவலர், சாரதா பதிப்பகம். முதற்பதிப்பு-2015, சென்னை-14.

7. **வீரமாமுனிவர் - தேம்பாவணி,** உரையாசிரியர் வித்துவான் ந.ம.மரிய அருள்பிரகாசம், நோபிலி புத்தக நிலையம், மதுரை-07.

8. **புலவர் பா. குழந்தை - இராவணகாவியம்,** உரையாசிரியர் பேராசிரியர் ந.வெற்றியழகன், சாரதா பதிப்பகம், மூன்றாம் பதிப்பு -2006, சென்னை-14.

9. **தண்டியார் - தண்டியலங்காரம்,** உரையாசிரியா ்முனைவர்.ச.திருஞானசம்பந்தம், கதிர் பதிப்பகம். முதற்பதிப்பு 2007, திருவையாறு-04.

10. **அமிதசாகரர் - யாப்பருங்கலக்காரிகை,** திருநெல்வேலித் தென்னிந்திய சைவசித்தாந்த நூற்பதிப்புக் கழகம், லிமிடெட், சென்னை- 21ஆம் பதிப்பு சூலை 1997.

11. **இராஜகோபாலாச்சாரியார், கே.,யாப்பியல்,** ஸ்டார் பிரசுரம், சென்னை-5, முதல் பதிப்பு, மே - 1998.

கற்பித்தல் மற்றும் கற்றல் முறைகள்

- காட்சிவிளக்கமென்பொருள் (Power Point Presentation)
- வினா - விடைமுறை
- விளக்கவுரை - கருத்துரைவழங்கல்
- குழு விவாதம்
- பயிற்சிக் கட்டுரைவழங்கல்

பாடத்திட்ட விளைவுகள்

CO	பாடத்திட்டவிளைவுகள்	Level
CO1	தமிழ்க் காப்பிய இலக்கிய வரலாற்றுக் குறிப்புகளைக் காலவரிசைப்படித் தெரிந்து கொள்வர்.	K1, K2
CO2	காப்பியம் சுட்டும் அறக்கருத்துகளை இன்றைய சமூக, அரசியல், பொருளாதாரப் பின்புலத்தில் பகுத்துப்பார்க்கும் திறன் பெறுவர்.	K2, K3
CO3	போட்டித் தேர்வுகளில் சாதிப்பதற்குத் தேவையான தகவலறிவைப் பெறுவர்.	K3
CO4	மொழித்திறனை மேம்படுத்தும் வழிமுறைகளை அறிந்துகொள்வர்.	K3
CO5	ஊரைநடை வழியாக கருத்து வெளிப்பாட்டுத்திறனையும் படைப்புத் திறனையும் பெற்று எழுத்தாளர் ஆவர்.	K3

வினாத்தாள் அமைப்புமுறை (Blue Print)

பகுதி	மதிப்பெண்	அலகு-1	அலகு-2	அலகு-3	அலகு-4	அலகு-5	மொத்தம்
அ	10	2	2	2	2	2	10
ஆ	30	5,5	5	5	5	5	30
இ	60	10,10	10	10	10	10	60
மொத்தம்	100	32	17	17	17	17	100

வகுப்பு : பி.ஏ, பி.எஸ்.சி இரண்டாமாண்டு   பாடம்   : சங்கத்தமிழ்

பருவம் : நான்காம் பருவம்   மணிகள்   : 90

பாடக் குறிப்பு:**22UTAL44**   மதிப்புப் புள்ளி: 5

(2022 - 2023ஆம் கல்வியாண்டு முதல் சேரும் மாணவர்களுக்குரியது)

பகுதி-**I** பொதுத்தமிழ் - சங்கத்தமிழ்

விளைவு அடிப்படையிலான கல்விப் பாடத்திட்டம்

(Outcome Based Education)

சங்கத்தமிழ்ப் பாட வரையறை

(2023-2024, 2024-2025, 2025-2026)

நோக்கம்

1. சங்க இலக்கியங்களை அறிமுகம் செய்தல்.
2. பழந்தமிழர்களின் மரபு பண்பாடு கற்பித்தல்
3. மாணவர்களின் படைப்பாற்றல் திறனை மேம்படுத்தும் நோக்கில் மாணவர்களை நாடகம் எழுதவும் நடிக்கவும் கற்றுக்கொடுத்தல்,
4. நாட்டார் கலை, இலக்கிய, வழிபாட்டு மரபுகளின் முக்கியத்துவத்தை அறியச்செய்தல்

அலகு 1 செய்யுள்   **30 மணிகள்**

அ. பத்துப்பாட்டு

1. **குறிஞ்சிப்பாட்டு**– (1முதல் 125 அடிகள் வரை)

ஆ. எட்டுத்தொகை

2. **நற்றிணை**– நெய்தல்திணை

* நீயும் யானும் நெருநல் பூவின் …- குடவாயிட் கீரத்தனார் (பாடல் 27)

* பெருமுது செல்வர் பொன்னுடையப் புதல்வர்…. - முதுகூற்றனார்(பாடல்58)

3. **குறுந்தொகை**– குறிஞ்சித்திணை

* விரிதிரைப் பெருங்கடல் வளைஇய உலகமும்…. –பருஉமோவாய்ப் பதுமனார் . (பாடல் எண்: 101)

* பார்ப்பன மகளே பார்ப்பன மகளே…. – பாண்டியன் ஏனாதி நெடுங்கண்ணனார் (பாடல் எண்: 156)

* சுடுபுன மருங்கிற் கழிந்த வேனற்…. – கபிலர் (பாடல் எண்: 291)

* முழந்தாள் இரும்பிடிக் கயந்தலைக் குழவி…– குறியினராயர்(பாடல் 394)

4. **ஐங்குறுநூறு**– ஓரம்போகியார்

* மருதத்திணை – 5 பாடல்கள்
  புலவிப்பத்து – பாடல் எண்கள் - (41,42,43,44,45)

5. **கலித்தொகை**

* கோதை ஆயமும் அன்பையும் அறிவுறப்……" நெய்தல்கலி -நல்லந்துவனார் (பாடல் எண்: 122)

6. அகநானூறு - முல்லைத்திணை

- வந்து வினைமுடித்தனன் வேந்தனும் பகைவரும்.... – குடவாயிற் கீர்த்தனார்
  (பாடல் எண் 44)
- இருவிசும்பு அதிர முழங்கி, அர நலிந்து...இடைக்காடனார் அல்லது கல்லாடனார்
  (பாடல் எண் 274)

7. பதிற்றுப்பத்து

- இரும்பனம்புடையல் ஈகை, வான்கழல்.... பரணர் (கடல்பிறகோட்டிய
  செங்குட்டுவன்)(பாடல் எண் 42)
- உறல்உறுகுருதிச்செருக்களம் புலவக்.... பெருங்குன்றூர்கிழார் (இளஞ்சேரல்
  இரும்பொறை)(பாடல் எண் 86)

8. பரிபாடல்- திருமால்

- மணிவரை ஊர்ந்த மங்குல் ஞாயிற்று...1-25 அடிகள்வரை(பாடல் எண் 13)

9. புறநானூறு

- ஆவும் ஆனியற் பார்ப்பன மாக்களும்..... - நெட்டிமையார்(பாடல் எண் 9)
- ஒரு நாள் செல்லலம், இருநாள் செல்லலம்....- ஔவையார் (பாடல் 101)

இ. பதினெண்கீழ்க்கணக்கு நூல்கள்

10. திருக்குறள் - இரண்டு அதிகாரங்கள்
- இனியவை கூறல் (அறத்துப்பால்)அதிகாரம் - 10
- நெஞ்சொடு புலத்தல் (காமத்துப்பால்)அதிகாரம் - 130

11. நாலடியார்
- இளமை நிலையாமை (1முதல் 5முடிய) – ஐந்து பாடல்கள்(அதிகாரம்-2)

12. இனியவை நாற்பது – ஐந்து பாடல்கள்
- கொல்லாமை முன் இனிது....(பாடல் எண்: 5)
- பிறன் கைப்பொருள் வெளவான்....(பாடல் எண்- 21)
- கயவரை கைவாழ்தல் இனிதே....(பாடல் எண்- 29)
- அவ்வித்து அழுக்காறு உரையாமை முன் இனிதே....(பாடல் எண்- 36)
- பத்துக்கொடுத்தும் பதி இருந்து வாழ்வு இனிதே....(பாடல் எண்- 40)

13. நான்மணிக்கடிகை
- நல்லாள் பிறக்குங்குடி (பாடல் எண் 4)
- மொய் சிதைக்கும் ஒற்றுமை இன்மை ஒருவனைப்...(பாடல் எண் 21)
- இளமைப்பருவத்துக் கல்லாமை குற்றம் (பாடல் எண் 92)
- இன்சொல்லான் ஆடும் கிழமை இனிப்பில்லா (பாடல் எண் 103)

14. முதுமொழிக்காஞ்சி - சிறந்த பத்து
- ஆர்கலி உலகத்து மக்கட்கெல்லாம் ஓதலின் சிறந்தன்று ஒழுக்கம் உடைமை...
  (பாடல் எண் 1)

அலகு– 2 இலக்கிய வரலாறு – சங்க இலக்கியம்   15 மணிகள்

சங்க இலக்கியம - சங்கம் சான்றுகள் - சிறப்புகள் - எட்டுத்தொகை –
பத்துப்பாட்டு – பதினெண்கீழ்கணக்கு நூல்கள்

அலகு– 3 நாடகம்   15 மணிகள்

மு.இராமசுவாமி மற்றும் செண்பகம் இராமசுவாமி – சாப விமோசனம்(மூன்று
நாடகங்கள்)

அலகு – 4 பொருளிலக்கணம்   15 மணிகள்

அகத்திணையியல் - புறத்திணையியல்

அலகு – 5 நாட்டார் வழக்காற்றியல்   15 மணிகள்

நாட்டார் வழக்காற்றியல் விளக்கம் - நாட்டார் கூத்துக்கள் - நாட்டார்
விளையாடல்கள் - நாட்டார் வழிபாடுகள் - நாட்டார் கதைகள் - நாட்டார்
பாடல்கள் - நாட்டார் மருத்துவம் - நாட்டார் விடுகதைகள் - நாட்டார் பழமொழிகள்

பாட நூல்கள்

1. முனைவர் ஆ. அருள்செல்வி (தொகுப்பாசிரியர்), **சங்கத்தமிழ்,** தமிழ்த்துறை வெளியீடு, அருள் ஆனந்தர் கல்லூரி, கருமாத்தூர்.
2. மு.இராமசுவாமி மற்றும் செண்பகம் இராமசுவாமி, **சாப விமோசனம்,** நியூசெஞ்சுரி புக் ஹவுஸ், சென்னை, எட்டாம் பதிப்பு ஜூன் 2022.

பார்வை நூல்கள்

1. முனைவர் கி.ராசா, தமிழர் இலக்கிய வரலாறு, அன்னை நிலையம், திருச்சி.
2. முனைவர் ச.வே.சுப்பிரமணியன், **தொல்காப்பியம் - தெளிவுரை,** மணிவாசகர் பதிப்பகம், சென்னை.
3. முனைவர் பாக்கியமேரி, **வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு,** நியூ செஞ்சுரி புக்ஹவுஸ். சென்னை.
4. முனைவர் சு.சண்முகசுந்தரம், **நாட்டுப்புறவியல்,** மணிவாசகர் பதிப்பகம், சென்னை.
5. முனைவர் தே.லூர்து, நாட்டார் வழக்காற்றியல் அடிப்படைகள், நாட்டார் வழக்காற்றியல் ஆய்வு மையம்.

கற்றல் மற்றும் கற்றல் முறைகள்

1. விரிவுரை
2. வரைபடங்கள் வழி விளக்குதல்
3. கலந்துரையாடல்
4. சுயபயிற்சியின் வழி அறிக்கை தயாரித்தல்
5. கள ஆய்வு

பாடத்திட்ட விளைவுகள்

CO	பாடத்திட்ட விளைவுகள்	Level
CO1	சங்க இலக்கியம் பற்றிய அறிமுகமும் செய்யுளைச் சீர் பிரித்து வாசிக்கவும் அறிந்து கொள்வர்	K1 K2
CO2	சங்க கால சமூக, அரசியல், பண்பாட்டு வாழ்வியலை அறிந்துகொள்வர்.	K1 K3
CO3	சங்க இலக்கியப் பழஞ்சொற்களை அகராதி துணைகொண்டு புரிந்துகொள்வர்	K2

CO4	படைப்பாற்றல் திறனை மேம்படுத்தும் நோக்கில் நாடகம் எழுதவும் நடிக்கவும் கற்றுக்கொள்வர்.	K5
CO5	நாட்டார் கலை, இலக்கிய, வழிபாட்டு மரபுகளின் முக்கியத்துவத்தை அறிந்துகொள்வர்	K4, K5

வினாத்தாள் அமைப்புமுறை (Blue Print)

பகுதி	மதிப்பெண்	அலகு-1	அலகு-2	அலகு-3	அலகு-4	அலகு-5	மொத்தம்
அ	10	2	2	2	2	2	10
ஆ	30	5+5	5	5	5	5	30
இ	60	10+10	10	10	10	10	60
மொத்தம்	100	32	17	17	17	17	100

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி)

ஆனந்தாநகர், கருமாத்தூர் – 625514.

வகுப்பு : பி.ஏ.,பி.எஸ்.சி., இரண்டாமாண்டு   பாடம்   : அடிப்படைத்தமிழ் -1

பருவம் : மூன்றாம் பருவம்   மணிகள் : 45

பாடக் குறியீடு : **22UTMN13**   மதிப்புப் புள்ளி : 3

(2022 - 2023ஆம் கல்வியாண்டு முதல் சேரும் மாணவர்களுக்குரியது)
பகுதி -4 பொதுத்தமிழ் -அடிப்படைத்தமிழ் -1
(Non Major Elective)
விளைவு அடிப்படையிலான கல்விப் பாடத்திட்டம்
(Outcome Based Education)
அடிப்படைத்தமிழ் -1 -பாடவரையறை

(2023-2024, 2024-2025, 2025-2026)

பத்து அல்லது பன்னிரண்டாம் வகுப்பு வரையில் தமிழ்மொழி கற்காத மாணவர்கள்,தமிழ்மொழியைக் கற்றுக்கொள்ளும் வகையில் இரண்டாமாண்டு மூன்றாம் பருத்தில் அடிப்படைத்தமிழ் -1, பாடம் அமைந்துள்ளது.

நோக்கம்

1. தமிழ் மொழியின ்சிறப்பையும் அதன் அடிப்படை பண்புகளையும் அறிமுகம் செய்தல்.
2. தமிழ் மொழியின் எழுத்துக்களைக் கற்பித்தல்.
3. தமிழ் எழுத்துக்களை எழுதுவதற்குப் பயிற்சியளித்தல்.
4. தமிழ்ச் சொற்களைத் தெளிவாகக் கற்று, அவற்றை ஒப்பிடும் திறனை எடுத்துரைத்தல்.
5. தமிழ் மொழியைச் சிறப்புறக் கற்று அதன் வளர்ச்சியை மதிப்பீடு செய்ய வழிகாட்டுதல்.

அலகு– 1   **9 மணிகள்**

தமிழ் மொழிதொன்மை, செறிவுஅறிமுகம், எழுத்துக்களின் வகை–எண்ணிக்கை–உயிர்எழுத்துக்கள் - மெய் எழுத்துக்கள் - உயிர்மெய் எழுத்துக்கள் - ஆய்த எழுத்து - இன எழுத்துக்கள் - வடமொழ ீஎழுத்துக்கள்.

அலகு– 2   **9 மணிகள்**

எழுதும் பயிற்சி - தமிழ் எழுத்து வடிவங்களைக் காட்டி அவற்றை இனங்காணல் - வேறுபடுத்தல்-ஒலிப்புமுறை–பொருத்தமான எழுத்தைத் தேர்ந்தெடுத்து எழுத்துக்களை எழுதப் பயிற்றுவித்தல்.

அலகு– 3   **9 மணிகள்**

சொற்கள் கற்றல் -பெயர்ச் சொற்கள் - கல்லூரிச் சூழல், உணவு வகைகள், காய்கறிகள், பழங்கள், நிறங்கள், பிரதிப் பெயர்கள்.

அலகு– 4   **9 மணிகள்**

சொற்கள் கற்றல் வினைச் சொற்கள் 20 கற்கவைத்தல்.

அலகு– 5   **9 மணிகள்**

எளிய தொடர்கற்றல் (Conjunction)

பார்வை நூல்கள்

- நான்காம் வகுப்பு, ஐந்தாம் வகுப்புகளுக்குரிய பாடநூல்கள் - வெளியீடு தமிழ்நாட்டுப் பாடநூல் கழகம், கல்லூரிச்சாலை,சென்னை– 600 006.

கற்றல் மற்றும் கற்றல் முறைகள்

1. விரிவுரை
2. வரைபடங்கள் வழி விளக்குதல்
3. கலந்துரையாடல்
4. படங்கள் காட்டிபயிற்றுவித்தல்
5. களஆய்வு

பாடத்திட்ட விளைவுகள்

CO	பாடத்தின் விளைவுகள்	Cognitive Level (K – level)
CO-1	தமிழ் மொழியின் சிறப்பையும் அதன் அடிப்படை அறிவையும் பெறுவர்	K-1
CO-2	தமிழ் மொழியின் எழுத்துக்களை அறிந்து கொள்வர்	K-2
CO-3	தமிழ் எழுத்துக்களை எழுதும் முறையினை வழக்கில் பயன்படுத்துவர்	K-3
CO-4	தமிழ்ச் சொற்களைத் தெளிவாகக் கற்றுக் கொண்டு அவற்றை ஒப்பிடும் திறனைப் பெறுவர்	K-4
CO-5	தமிழ் மொழியைச் சிறப்புறக் கற்று அதன் வளர்ச்சியை மதிப்பிடும் திறனைப் பெறுவர்	K-5

வினாத்தாள் அமைப்புமுறை (Blue Print)

பகுதி	மதிப்பெண்	அலகு-1	அலகு-2	அலகு-3	அலகு-4	அலகு-5	மொத்தம்
அ	10	2	2	2	2	2	10
ஆ	30	5+5	5	5	5	5	30
இ	60	10+10	10	10	10	10	60
மொத்தம்	100	32	17	17	17	17	100

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி)
ஆனந்தாநகர், கருமாத்தூர் – 625514

வகுப்பு : பி.ஏ.,பி.எஸ்.சி., இரண்டாமாண்டு   பாடம் : அடிப்படைத்தமிழ்-2

பருவம் : நன்காம் பருவம்   மணிகள் : 45

பாடக் குறியீடு : **22UTMN24**   மதிப்புப் புள்ளி : 3

(2022 - 2023ஆம் கல்வியாண்டு முதல் சேரும் மாணவர்களுக்குரியது)
பகுதி - 4 பொதுத்தமிழ் - அடிப்படைத்தமிழ் -2
(Non Major Elective)
விளைவு அடிப்படையிலான கல்விப் பாடத்திட்டம்
(Outcome Based Education)
அடிப்படைத்தமிழ் -2- பாடவரையறை
(2023-2024, 2024-2025, 2025-2026)

பத்து அல்லது பன்னிரண்டாம் வகுப்புவரையில் தமிழ்மொழி கற்காத மாணவர்கள், தமிழ்மொழியைக் கற்றுக்கொள்ளும் வகையில் இரண்டாமாண்டு மூன்றாம் பருவத்தில் அடிப்படைத்தமிழ் -2, பாடம் அமைந்துள்ளது.

நோக்கம்

1. தமிழ் இலக்கணம் திணை, பால், ஒருமை–பன்மை எதிர்ச்சொற்கள் அறிதல்.
2. தமிழ் இலக்கணம் - மூன்றுகாலங்களை அறிதல் - வாக்கியம் அமைத்து எழுதுதல்.
3. எளிய உரைநடைகள் உருவாக்கி எழுதுதல், பேசுதல்.
4. குள ஆய்வுவழி தமிழ் கற்பித்தல்.
5. தமிழ் இலக்கியத்தையும் அதன் வகைமையையும் தெரிந்துகொள்வர்.

அலகு - 1   9 மணிகள்

திணை -பால் -ஒருமை–பன்மை–எதிர்ச் சொற்கள் கற்றல். பிரதிப் பெயர்களைக் கொண்டுவாக்கியம் அமைத்தல்(Conjugation).

அலகு– 2   9 மணிகள்

காலங்களைக் கற்பித்தல்நிகழ்காலம் - இறந்தகாலம் - எதிர்காலம்,தமிழ்ப் புலவர்கள், நூல்கள் அறிமுகம் செய்துபெயர்களைக் கற்கவைத்தல்.

அலகு– 3   9 மணிகள்

எளியவாக்கியங்கள் அமைத்தல்,எளியஉரையாடல்களைப் பயிற்றுவித்தல்-(பேருந்துநடத்துனர்,வியாபாரி,நண்பன்,குழந்தை,மற்றும் ஆசிரியர் ஆகியோருடன் உரையாடப் பயிற்றுவித்தல்)தமிழரின் விருந்தோம்பலைஅறிமுகம் செய்துஉணவறையில் பயன்படுத்தும் வாக்கியங்களைஅறிமுகம் செய்தல்.

அலகு-4   9 மணிகள்

மதுரைஅருகில் அமைந்துள்ள இடம் மற்றும் கோயில் பற்றிவிளக்குதல். பயணம்: பேருந்தில் பயணம் செய்யும் முறையைப் பற்றிவிளங்கவைத்தல்- வாசித்தல் - எழுதுதல்.

அலகு– 5   9 மணிகள்

திருக்குறள் அறிமுகம்,ஐந்துதிருக்குறள்களைப்பயிற்றுவித்தல்.

பார்வை நூல்கள்

- ஒன்றாம் வகுப்பு, இரண்டாம் வகுப்பு, மூன்றாம் வகுப்புகளுக்குரிய பாடநூல்கள் - வெளியீடு தமிழ்நாட்டுப் பாடநூல் கழகம், கல்லூரிச்சாலை, சென்னை– 600 006.

கற்றல் மற்றும் கற்றல் முறைகள்

1. விரிவுரை
2. வரைபடங்கள் வழி விளக்குதல்
3. கலந்துரையாடல்
4. களஆய்வு வழி புதிய உரையாடல்களை உருவாக்க கற்பித்தல்
5. களஆய்வு

பாடத்தின் விளைவுகள்

CO	பாடத்தின் விளைவுகள்	Cognitive Level (K – level)
CO-1	தமிழ் இலக்கணம் திணை, பால், ஒருமை–பன்மை எதிர்ச்சொற்கள் அறிந்துகொள்வர்.	K-1
CO-2	தமிழ் இலக்கணம் - மூன்று காலங்களை அறிதல் - வாக்கியம் அமைத்து எழுதக் கற்றுக்கொள்வர்.	K-1, K-2
CO-3	எளிய உரைநடைகள் உருவாக்கி எழுத, பேசக் கற்றுக்கொள்வர்.	K-2, K-3
CO-4	களஆய்வு வழி தமிழ் கற்றுக்கொள்வர்.	K-4
CO-5	தமிழ் இலக்கியத்தையும் அதன் வகைமையையும் தெரிந்துகொள்வர்.	K-5

வினாத்தாள் அமைப்புமுறை (Blue Print)

பகுதி	மதிப்பெண்	அலகு-1	அலகு-2	அலகு-3	அலகு-4	அலகு-5	மொத்தம்
அ	10	2	2	2	2	2	10
ஆ	30	5+5	5	5	5	5	30
இ	60	10+10	10	10	10	10	60
மொத்தம்	100	32	17	17	17	17	100

வகுப்பு	: பி.ஏ.,பி.எஸ்சி. இரண்டாமாண்டு	பாடம்	: சிறப்புத்தமிழ் - 1
பருவம்	: மூன்றாம்பருவம்	நேரம்	: 45 மணிகள்
குறியீடு	: **22UTMM13**	மதிப்புப்புள்ளி	: 2

(2022 - 2023ஆம் கல்வியாண்டுமுதல் சேரும் மாணவர்களுக்குரியது)
பகுதி - 4 பொதுத்தமிழ் -சிறப்புத்தமிழ் -1
(Non Major Elective)
விளைவுஅடிப்படையிலானகல்விப் பாடத்திட்டம்
(Outcome Based Education)
சிறப்புத்தமிழ் -1 -பாடவரையறை
(2023-2024, 2024-2025, 2025-2026)

நோக்கம்

1. மரபுக் கவிதையும் புதுக்கவிதையையும் அறிமுகம் செய்தல்.
2. படைப்பிலக்கியத்தை அறிமுகம் புதியபடைப்புகளை உருவாக்கச் செய்தல்.
3. தமிழில் உள்ள சமய இலக்கியங்களை அறிமுகம் செய்தல்.
4. இக்கால இலக்கிய வரலாற்றைக் கற்றுத்தருதல்
5. பிழையின்றி எழுத எழுத்துப்பயிற்சிக் கொடுத்தல்.

அலகு - 1   **(9 மணிகள்)**

பாரதியார்–வேண்டுவன–நல்லதோர்வீணை–

அன்னையைவேண்டுதல்,பாவலரேறுபெருஞ்சித்திரனார்–சாதிப்புழுக்கள்   நெளிந்திடும்
சாணித்திரளைகள் நாம்! - அப்துல் ரகுமான் - புதியபாரதம்,வண்ணதாசன் -
மெல்லினம்,இன்குலாப் - ஒவ்வொருபுல்லையும் பெயர்சொல்லிஅழைப்பேன்,ஹைக்கூ -
தணிக்கைச் செல்வன்

அலகு - 2   **(9 மணிகள்)**

தேவாரம் -திருநாவுக்கரசர்   -திருவிடைமருதூர்ப் பதிகம்(10 பாடல்கள்)
நாலாயிரதிவ்யபிரபந்தம்   - திருப்பாணாழ்வார்(10 பாடல்கள்)
அமலன் ஆதிபிரான்... -
திருவருட்பா   - இராமலிங்கஅடிகளார் (7பாடல்கள்)ஆறாம் திருமுறை
சித்தர் இலக்கியம் -கடுவெளிச்சித்தர் (10 பாடல்கள்)

பக்திப் பாடல்கள் (4 பாடல்கள்)

புல்லாங்குழல் கொடுத்த...

ஆயிரம் இதழ் கொண்ட...

உன் திருயாழில்...

இறைவனிடம் கையேந்துங்கள்...

பெத்லகேம் குறவஞ்சி-வேதநாயகசாஸ்திரியார் (8 பாடல்கள்) பவனிச் சிந்து
ஷம்சுத்தீன் கோவை-செய்குத்தம்பிப் பாவலர் (6 பாடல்கள்)

தாய் துஞ்சாமை...

நாய் துஞ்சாமை...

காவலர் கடுகுதல்…

நிலவு வெளிப்படுதல்…

கூகை குழறுதல்…

கோழிகுரற் காட்டுதல்…

அலகு -3   (9 மணிகள்)

இருபதாம் நூற்றாண்டு இலக்கிய வரலாறு– கவிமணி தேசிய விநாயகம் பிள்ளை, பாரதியார், நாமக்கல் கவிஞர்,பாரதிதாசன், சிறுகதை, புதினம், பெண் எழுத்துகள்

அலகு - 4   (9 மணிகள்)

பக்தி இலக்கிய வரலாறு, சைவமும் தமிழும், வைணவமும் தமிழும், இஸ்லாமும் தமிழும், கிறித்தவமும் தமிழும் (தேர்ந்தெடுக்கப்பட்டபகுதிகள்)

அலகு - 5   (9 மணிகள்)

எழுத்து இலக்கணம் - வல்லினம் மிகும் இடங்கள், வல்லினம் மிகா இடங்கள **தமிழ்த் தொடரியல்** சொல் - விளக்கம், வகைகள், தொடர் - விளக்கம், வகைகள், உறுப்புகள், வாக்கிய வகைகள் - பொருள் நிலைப் பாகுபாடு, அமைப்புநிலைப் பாகுபாடு, இயைபு - திணை, பால், எண், இடம், காலம், மரபு,, வழு

பார்வை நூல்கள்

1. முனைவர் ஆ.ஜோசப் சார்லிஆதாஸ்(தொகுப்பாசிரியர்), வளர்தமிழ், தமிழ்த்துறை வெளியீடு அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி), கருமாத்தூர் -625514.

2. முனைவர் சு. கணேஷ் (தொகுப்பாசியர்) தெய்வத்தமிழ், தமிழ்த்துறை வெளியீடு அருள் ஆனந்தர் கல்லூரி, கருமாத்தூர்,மதுரை மாவட்டம், முதல் பதிப்பு 2022.

3. கி. இராசா,தமிழர் இலக்கிய வரலாறு, அன்னை நிலையம், திருச்சிராப்பள்ளி, முதல் பதிப்பு-2001.

4. முனைவர் பாக்கிய மேரி, வெற்றி நோக்கில் இலக்கணம் இலக்கிய வரலாறு மொழித்திறன், பூவேந்தன் பதிப்பகம், மயிலாப்பூர், சென்னை, முதல் பதிப்பு- 2013.

5. வெ.கிருட்டிணசாமி, சமயமும் சிற்றிலக்கியமும், தமிழ்த்துறை வெளியீடு, அருள் ஆனந்தர் கல்லூரி, கருமாத்தூர், மதுரை மாவட்டம், முதல் பதிப்பு: 1996.

6. முனைவர் முத்துசந்தானம், தமிழ்த் தொடரியல், தமிழ்த்துறை வெளியீடு, அருள் ஆனந்தர் கல்லூரி, கருமாத்தூர், மதுரைமாவட்டம், முதல் பதிப்பு: 1992.

7. மு.வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்திய அகாடமி, புதுடெல்லி., பதிப்பு– 2010

கற்றல் மற்றும் கற்றல் முறைகள்

1. விரிவுரை
2. வரைபடங்கள் வழி விளக்குதல்
3. கலந்துரையாடல்
4. சிறப்புச் சொற்பொழிவுஏற்பாடுசெய்தல்
5. களஆய்வு
6. Power Point Presentation

பாடத்திட்டத்தின் விளைவுகள்

CO	பாடத்திட்டத்தின் விளைவுகள்	Level
CO 1	தற்கால இலக்கிய வகைமைகளை அறிதல்.	K 1
CO 2	மரபுக்கவிதை, புதுக்கவிதை எழுதும் வகையிலான உத்திகளைக் கண்டறிதல்.	K 1, K3
CO 3	புதுக்கவிதை எழுத முயற்சிப்பர்.	K 3, K4
CO 4	தமிழ் இலக்கிய வரலாற்றில் பக்தி இலக்கியம் பெறும் சிறப்பை அறிவர்.	K 1, K2, K3
CO 5	பிழையின்றி எழுதும் திறன் பெறுவர்	K4, K5

வினாத்தாள் அமைப்புமுறை *(Blue Print)*

பகுதி	மதிப்பெண்	அலகு-1	அலகு-2	அலகு-3	அலகு-4	அலகு-5	மொத்தம்
அ	10	2	2	2	2	2	10
ஆ	30	5,5	5	5	5	5	30
இ	60	10,10	10	10	10	10	60
மொத்தம்	100	32	17	17	17	17	100

வகுப்பு	: பி.ஏ.,பி.எஸ்சி. இரண்டாமாண்டு	பாடம்	: சிறப்புத்தமிழ்-2
பருவம்	: மூன்றாம் பருவம்	நேரம்	: 45 மணிகள்
குறியீடு	: 22UTMM24	மதிப்புப்புள்ளி	: 2

(2022 - 2023ஆம் கல்வியாண்டு முதல் சேரும் மாணவர்களுக்குரியது)
பகுதி - 4 பொதுத்தமிழ் -சிறப்புத்தமிழ் -2
(Non Major Elective)
விளைவு அடிப்படையிலான கல்விப் பாடத்திட்டம்
(Outcome Based Education)
சிறப்புத்தமிழ் -2 -பாடவரையறை
(2023-2024, 2024-2025, 2025-2026)

நோக்கம்

1. காப்பியம் மற்றும் சங்க இலக்கியங்கள் தோன்றுவதற்கான சமூகப் பின்புலத்தை எடுத்துரைத்தல்.
2. காப்பியம் மற்றும் சங்க இலக்கியம் அறிமுகம் செய்தல்.
3. காப்பியம் மற்றும் சங்க இலக்கியத்தைப் பண்பாட்டு அடிப்படையில் கற்றுத்தருதல்.
4. காப்பியக் கதை, சங்கத்தமிழர் மரபு போன்றவைகள் இன்றைய இலக்கியங்களில் பயன்றுவரும் போக்குகளைச் சுட்டுதல்.
5. காப்பிய,சங்கப் பாடல்களில் இடம்பெறும் யாப்பு வடிவங்களை எடுத்துரைத்தல்.

அலகு - 1	**காப்பிங்கள்**	**(9 மணிகள்)**

சிலப்பதிகாரம் - கனாத்திரம் உரைத்தகாதை
திருத்தக்கத் தேவர்–சீவகசிந்தாமணி–விமலையார் இலம்பகம்
தேம்பாவணி–சீனாய் மாமலைகண்டபடலம்

அலகு - 2	**சங்க இலக்கியம்- நீதி இலக்கியம்**	**(9 மணிகள்)**

திருக்குறள் - அறத்துப்பால் - இனியவை கூறல், (10),
                        காமத்துப்பால் - நெஞ்சொடுபுலத்தல் (130)
எட்டுத்தொகை–நற்றிணை– 27, 58
குறுந்தொகை– 101-156
ஐங்குநுறூறு - மருதத்திணை 5 பாடல்கள் - புலவிப்பத்து 41,42,43,44,45
புறநானுறு–பாடல் எண் 9

அலகு -3	**இலக்கியவரலாறு**	**(9 மணிகள்)**

காப்பிய இலக்கியம் - ஐம்பெரும் காப்பியங்கள் - ஐஞ்சிறுகாப்பியங்கள்

அலகு - 4	**இலக்கியவரலாறு**	**(9 மணிகள்)**

சங்க இலக்கியம் - எட்டுத்தொகை-பத்துப்பாட்டு-நீதி இலக்கியம்

அலகு - 5	**இலக்கணம்**	**(9 மணிகள்)**

அணிகள்(உவமை,உருவகம்,வேற்றுமை,பிரிதுமொழிதல்,தற்குறிப்பேற்றம்)
பெருள் இலக்கணம் - அகத்திணையியல் - புறத்திணையியல்

பார்வை நூல்கள்

1. இளங்கோவடிகள் -சிலப்பதிகாரம், உரையாசிரியர் ந.மு.வேங்கடசாமி நாட்டார், திருநெல்வேலி, தென்னிந்திய சைவசித்தாந்த நூற்பதிப்புக் கழகம் லிமிடெட். 154, டி.டி.கே.சாலை, ஜூலை (இரண்டாம் பதிப்பு), 1999, சென்னை– 600 018.

2. திருத்தக்கத்தேவர்- சீவகசிந்தாமணி, உரையாசிரியா ்டாக்டர் துரை இராசாராம், முல்லை நிலையம், மறுபதிப்பு 2010, சென்னை-14.

3. வீரமாமுனிவர்- தேம்பாவணி, உரையாசிரியர் வித்துவான் ந.ம.மரிய அருள்பிரகாசம், நோபிலி புத்தக நிலையம், மதுரை-07.

4. இராஜகோபாலாச்சாரியார், கே.,யாப்பியல், ஸ்டார் பிரசுரம், சென்னை-5, முதல் பதிப்பு, மே— 1998.

5. முனைவர்கி.ராசா, தமிழர் இலக்கிய வரலாறு, அன்னை நிலையம், திருச்சி.

6. முனைவர்ச.வே.சுப்பிரமணியன், தொல்காப்பியம் - தெளிவுரை, மணிவாசகர்பதிப்பகம், சென்னை.

7. முனைவர்பாக்கியமேரி, வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, நியூ செஞ்சுரி புக்ஹவுஸ். சென்னை.

8. தண்டியார் - தண்டியலங்காரம், உரையாசிரியர் முனைவர்.ச.திருஞானசம்பந்தம், கதிர் பதிப்பகம். முதற்பதிப்பு 2007, திருவையாறு- 4

கற்றல் மற்றும் கற்றல் முறைகள்

1. விரிவுரை
2. வரைபடங்கள் வழி விளக்குதல்
3. கலந்துரையாடல்
4. சுயபயிற்சியின் வழி அறிக்கைதயாரித்தல்
5. களஆய்வு
6. Power Point Presentation

பாடத்திட்டத்தின் விளைவுகள்

CO	பாடத்திட்டத்தின் விளைவுகள்	Level
CO 1	காப்பியம் மற்றும் சங்க இலக்கியங்கள் தோன்றுவதற்கான சமூகப் பின்புலத்தை தெரிந்துகொள்வர்.	K1
CO 2	காப்பியம், சங்க இலக்கியம், நீதி இலக்கியம் ஆகியவற்றை அறிந்துகொள்வர்.	K1, K2
CO 3	காப்பியம், சங்க இலக்கியம், நீதி இலக்கியம் ஆகியவற்றைப் பண்பாட்டு அடிப்படையில் ஒப்பிட்டுக் கற்றுக்கொள்வர்.	K1, K2
CO 4	காப்பியக் கதை ,சங்கத்தமிழர் மரபு, அற இலக்கிய மரபு போன்றவைகள் இன்றைய இலக்கியங்களில் பயன்றுவரும் போக்குகளை அறிந்து கொள்வர்.	K1, K2, K3
CO 5	காப்பிய, சங்கப் பாடல்களில் இடம்பெறும் யாப்பு வடிங்களின் புலமையும் யாப்பில் கவிதை எழுதும் திறனும பெறுவர்	K4, K5

வினாத்தாள் அமைப்புமுறை (Blue Print)

பகுதி	மதிப்பெண்	அலகு-1	அலகு-2	அலகு-3	அலகு-4	அலகு-5	மொத்தம்
அ	10	2	2	2	2	2	10
ஆ	30	5+5	5	5	5	5	30
இ	60	10+10	10	10	10	10	60
மொத்தம்	100	32	17	17	17	17	100

DEPARTMENT OF ENGLISH

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF ENGLISH
2022-2023
One Year Language
Semester I

Sub. Code	Class	Paper	Hours	Credit
22UENB11	I UG **RDS**	English through Prose & Short Story Stream – B	5	4

Semester II

Sub. Code	Class	Paper	Hours	Credit
22UENB22	I UG **RDS**	English through Prose & Poetry Stream – B	5	4

Two Year Language
Semester I

Sub. Code	Class	Paper	Hours	Credit
22UENA11	I UG **Philosophy, Maths, Physics, Chemistry**	English through Prose & Short Story Stream – A	5	4
22UENB11	I UG **History, Economics**	English through Prose & Short Story Stream – B	5	4

Semester II

Sub. Code	Class	Paper	Hours	Credit
22UENA22	I UG **Philosophy, Maths, Physics, Chemistry**	English through Prose & Poetry Stream – A	5	4
22UENB22	I UG **History, Economics**	English through Prose & Poetry Stream – B	5	4

Semester III

Sub. Code	Class	Paper	Hours	Credit
22UEN33	II UG **History, Economics, Philosophy, Maths, Physics, Chemistry**	English through Literature - I	6	4

Semester IV

Sub. Code	Class	Paper	Hours	Credit
22UEN44	II UG **History, Economics, Philosophy, Maths, Physics, Chemistry**	English through Literature – II	6	4

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF ENGLISH

Class	: II UG (Except RDS)	**Part**	: II
Semester	: III	**Hours**	: 90
Sub. Code	:	**Credits**	: 4

ENGLISH THROUGH LITERATURE
(For those who joined in 2022-2023 and after under the CBCS pattern)

Learning Outcome:
On successful completion of this course, the learners should have
  ➢ Learnt the language of great personalities through their life stories
  ➢ Acquired the nuances of English language – gestures, facial expressions and tone modulation
  ➢ Learnt sentence grammar and its usage
  ➢ Enhanced their creative writing skills
  ➢ been trained in role play and extempore

Unit – I (Life Stories): Extracts   **20 Hours**
      From *Something Beautiful for God*   *- Malcolm Muggeridge*
      From *My Autobiography*   – Charlie Chaplin
      From *The Story of My Life*   – Helen Keller

Unit – II Short Plays   **20 Hours**
      The Boy Comes Home   – A. A. Milne
      Mother's Day   – J. B. Priestley

Unit – III Grammar (Sentence)   **25 Hours**
      Sentences and Sentence Patterns
      Reported Speech/Writing
      Voice
      Conditionals

Unit- IV Writing Skills   **15 Hours**
      Letters
      Analogy
      Cloze test

Unit- V Oral Skills   **10 Hours**
      Role play
      Extempore

Text Books:
  English through Literature prepared by Department of English, Arul Anandar College (Autonomous), Madurai – 625 514

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF ENGLISH

Class	: II UG (Except RDS)	**Part**	: II
Semester	: III	**Hours**	: 3
Sub. Code	:	**Maximum Marks : 80**	

ENGLISH THROUGH LITERATURE
(For those who joined in 2022-2023 and after under the CBCS pattern)

_____

Pattern of the Question Paper

Section – A   (Life Stories and Short Plays)
(Level –K1 Remember / K2 Understanding)

Answer ALL the questions.

1. Choose the correct alternative (10 Questions – From Life Stories and Short Plays)
                                                                            10 x 1 = 10
                                                                            CO1/CO2/K2

2. Fill in the Blanks (5 Questions – From Life Stories and Short Plays)
                                                                            5 x 1 = 5
                                                                            CO1/CO2/K1

Section – B   (Life Stories and Short Plays)
(Level –K3 – Apply / K4 – Analysis)

Answer ALL the questions

3. Answer the following Questions in about 250 words each: 2 x 10 = 20
                                                                            CO2/K3/K4

        (Either. . . Or -- From Life Stories)

4. Answer any TWO of the following in about 100 words each: 2 x 5 = 10
                                                                            CO1/K3/K3

        (Either. . . Or -- From Short Plays)

Section – C   (Sentence Grammar & Writing Skills)
(Level – K2 – Understanding / K3 – Apply / K4 – Analysis / K5 – Evaluate / K6 – Create)

Answer ALL the questions

5. a) Rewrite the following **Compound Sentences** as **Complex Sentences** 5 x 1 = 5**CO3/K3**
                                    OR

5. b) Convert the following **Affirmative Sentences** into **Negative Sentences** without changing the meaning

6. a) Change the following sentences from **Direct Form** to **Indirect Form**   5 x 1 = 5 **CO3/K3**
                                    OR

6. b) Change the following sentences from **Indirect DirectForm** to **Direct Form**

7. a) Convert the following sentences into Passive Voice: 5 x 1 = 5 **CO3/K3**
                                    OR

7. b) Convert the following sentences into **Active Voice:**

8. a) Complete the sentences, taking care to use correct Tenses (**Conditionals**) 5 x 1 = 5
                                                                            CO3/K3
                                    OR

8. b) Fill in the Blanks with **If** or **Unless (Conditionals)**

9. a) Letter Writing **(Formal)**

<div align="right">5 x 1 = 5
CO4/K6</div>

OR

9. a) Letter Writing (**Formal)**

10. a) Choose the word from the options given below to complete the **Analogy**:

<div align="right">5 x 1 = 5
CO4/K3</div>

OR

10. b) Choose the word from the options given below to complete the **Analogy**:

11. a) **Cloze Test:** Fill in the Blanks with correct words: 5 x 1 = 5

<div align="right">**CO4/K3**</div>

OR

11. b) **Cloze Test:** Fill in the Blanks with correct words:

****

BLUE PRINT

Part	Marks	Unit – I	Unit - II	Unit - III	Unit - IV	Unit - V	Total
A	15	10	5	-	-	-	15
B	30	10+10	5 + 5	-	-	-	30
C	35	-	-	20	15		35
Oral Exam						20	20
Total							100

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF ENGLISH

Class	: II UG (Except RDS)	**Part**	: II
Semester	: IV	**Hours**	: 90
Sub. Code	:	**Credits**	: 4

ENGLISH THROUGH LITERATURE
(For those who joined in 2022-2023 and after under the CBCS pattern)

Learning Outcome:
On successful completion of this course, the students should have
➢ learnt critically appreciate the language of English plays
➢ showed interest for reading novels
➢ understood discourse grammar and got trained in transformation of sentences
➢ become experts in writing official documents
➢ prepare themselves face competitive examinations and interviews

Unit- I Play   **25 Hours**
      The Post Office   - Rabindranath Tagore
Unit- II Novel (Abridged)   **10 Hours**
      The Prince and the Pauper   - Mark Twain
Unit- III Grammar (Discourse)   **20 Hours**
      Transformation of Sentences
      Synthesis
      Coherence and Cohesion
Unit- IV Writing Skill Enhancement (General)   **15 Hours**
      Essay
      Agenda, Minutes
      Report
      E. Mail
      Circular and Notice
Unit- V Oral Skill Enhancement (Professional)   **20 Hours**
      Group Discussion
      Interviews
      Presentation – Speech Skills

Text Books:
1. English through Literature prepared by Department of English, Arul Anandar College
       (Autonomous), Madurai – 625 514
2. *The Post Office*   - Rabindranath Tagore
3. *The Prince and the Pauper*   - Mark Twain

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ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF ENGLISH

Class   : II UG (Except RDS)   Part   : II
Semester   : IV   Hours : 3
Sub. Code :   Maximum Marks: 80

ENGLISH THROUGH LITERATURE
(For those who joined in 2022-2023 and after under the CBCS pattern)
_____

Pattern of the Question Paper
Section – A   **(Play and Novel)**
(Level – K1 Remember / K2 Understanding / K3 - Apply)
Answer ALL the questions
1. Choose the correct alternative (10 Questions – From Play and Novel)

                                                                        10 x 1 = 10
                                                                        CO1/CO2/K2
2. Fill in the Blanks (5 Questions – From Play and Novel)   5 x 1 = 5
                                                                        CO1/CO2/K1

Section – B   **(Play and Novel)**
(Level –K3 – Apply / K4 – Analysis)
Answer ALL the questions
3. Answer the following Questions in about 250 words each: 2 x 10 = 20
                                                                        CO1/K3/K4

           (Either. . . Or -- From Play)
4. Answer the following in about 100 words each: 2 x 5 = 10
(Either. . . Or -- From Novel)   **CO2/K3/K4**

Section – C   **(Discourse Grammar &Writing Skill Enhancement)**
(Level – K2 – Understanding / K3 – Apply / K4 – Analysis / K5 – Evaluate / K6 – Create)
Answer ALL the questions
5. a) Convert the following **comparative degree into superlative degree**   5 x 1 = 5 **CO3/K3**
                                             OR
5. b) Convert the following **interrogative sentences into statements**

6. a) Combine the sentences **by using a preposition with a noun or a gerund** 5 x 1 = 5
                                                                        CO3/K3
                                             OR
6. b) Combine the sentences **by using an infinitive.**
7. a) Rewrite the following passage fill in the blank spaces with suitable linking words from the list given at the end of the passage.   **(Coherence / Cohesion)**   5 x 1 = 5 **CO3/K2**
                                             OR
7. b) the sentences below comprise a deconstructed paragraph. Rewrite them to make it focused and unified. **(Coherence/ Cohesion)**
8. a) Write an **Essay** in about 250 words on the topic given: 1 x 5 = 5 **CO4/K6**
                                             OR
8. b) Write an **Essay** in about 250 words on the topic given:
9. a) Prepare the **Agenda** and write the **Minutes** of the meeting**…**   1 x 5 = 5**CO4/K6**

OR

9. b) Prepare the **Agenda** and write the **Minutes** of the meeting**…**

10. a) Write a **Report** given topic: 1 x 5 = 5 **CO4/K6**

OR

10. b) Write an **Email** using the outline given:

11. a) Write a **Notic**e on the topic given: 1 x 5 = 5 **CO4/K6**

OR

11. b) Write a **Circular** on the topic given:

****

BLUE PRINT

Part	Marks	Unit – I	Unit - II	Unit - III	Unit - IV	Unit - V	Total
A	15	10	5	-	-	-	15
B	30	10+10	5 + 5	-	-	-	30
C	35	-	-	15	20		35
Oral Exam						20	20
Total							100

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
I Semester				
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	
V	22UNCC/NSS/ PHY.EDU/YRC / ROT/ACF/ NCB12	Extension Activities NCC / NSS / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
	22UBRC11	Bridge Course	-	1
			30	**24**
II Semester				
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 AD)	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 /NSS / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
			30	**24**
III Semester				
I	22UTAL13/ 22UHNL13/	Tamil / Hindi /	06	4

	22UFNL13	French		
II	22UENA33/ 22UENB33	English through Literature – I – Stream – A English through Literature – I – Stream – B	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 (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
	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	22UENA44/ 22UENB44	English through Literature – II – Stream – A English through Literature – II – Stream – B	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**
V Semester				
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	Fundamentals of Computer, Internet and Office Automation	01	1
	22USBY15	Fundamentals of Computer, Internet and Office Automation - Practical	02	1
V	22USSI16	Soft Skills (Interview & Group Discussion Skills)	02	
	22UINT15	Internship	0	1
			30	**24**
		VI Semester		
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
	22USBZ26	Web Design	01	1
	22USBY26	Web Design - Practical	02	1
V	22USSI16	Soft Skills (Leadership & Team Building Skills)	02	2
			30	**25**

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

PROGRAMME SPECIFIC OUTCOMES

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

PSO 1	Correlate the general course of human history in multiple areas of the world.
PSO 2	Analyze the fundamental Social, Economic, Political and Religious institutions existed in India through the ages.
PSO 3	Acquire administrative and exhibit managerial skills, problem solving skills, critical thinking and reflective thinking to receive placements in any companies, firms and managerial positions.
PSO 4	Develop the skills needed to pursue competitive examination which enhances the job opportunities.
PSO 5	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	: B.A.	Part	: III / Core -5
Semester	: III	Hours	: 75
Subject Code	: 22UHSC53	Credit	: 04

History of India – II

(From 712 to 1707 AD)

(Students admitted from the Academic Year 2022 – 2023 onwards)

Course Educational Objectives

To make the students

1. To understand the establishment of Turkish rule in India.
2. To evaluate the Administration of the Delhi Sultanate.
3. To analysis the administration of Mugals
4. To evaluate the contribution of Regional Kingdoms
5. To substantiate the Bhakthi Movement's historical importance in India

Unit – I: Foreign Invasion **(15 Hours)**

Sources – Arab conquests of Sindh – Muhamud of Ghazni – Muhamud of Ghor – Impact
Map: Invasion of Muhamud of Ghazni

Unit- II: Delhi Sultanate. **(15 Hours)**

Sources – Slave dynasty – Khilji dynasty – Tughlaq dynasty – Sayyid dynasty – Lodydynasty – Administration – Art and Architecture – Society - Economy – Decline of the Delhi Sultanate
Map: Empire of Ala-ud-din Khilji, Mohammud-bin-Tughluq

Unit – III: The Mughal Empire **(15 Hours)**

Sources – Babur – Humayun – Sur Interregnum – Sher Shah's Administration – Akbar – Jahangir - Shahjahan – Aurangazeb – Administration – Society – Economy - Religious life– Art and Architecture – Decline of the Empire .
Map: Mughal Empire under Aurangazeb

Unit – IV: Regional Kingdoms **(15 Hours)**

Bahmini kingdom – Mohammad Gawan – Vijaya Nagar Empire – Krishnadeva Raya – Administration – Society – Culture - Rise of the Marathas – Shivaji – Maratha's Administration

Unit – V: Bhakti movement in India **(15 Hours)**

Origin of Bhakthi Movement in India - Ramanuja – Ramanandha – Kabir - Tukaram– Mirabai –Sikh Movement - Guru Nanak

Book for Study

1. Khurana, K.L. History of India 1526-1947 A.D. Lakshmi NaraniAgarwal Educational Publishers, Agra, 1994.

2.Sharma, S.R. Mughal Empire in India. Lakshmi NaraniAgarwal Educational Publishers, Agra, 1971.

3. Majudar, T. C. Medieval India, Motilal Barsidars Publishers, Banaras, 1952.

Books for Reference

1. Mehta, J. L., An Advanced Study in the History of Medieval India (3 Vol.), Sterling, New Delhi, 2002.

2. Burton Stein, Vijayanagara, New Delhi, 2002.

3. Burton Stein, History of India, OUP, 2002.

4. Jackson, Peter, The Delhi Sultanate, Cambridge University Press, 1997.

5. Kumar, Sunil, The Emergence of the Delhi Sultanate, Permanent Black 2007.

6. Habib and Nizami, The Delhi Sultanate, Comprehensive History of India, Vol. V.

7. Mehta,J.L., **An Advanced Study in the History of Medieval India,** Sterling, New Delhi, 2000**.**

8. Burton Stein, **History of India**, OUP, 2002.

9. Majumdar, R.C et al., **An Advanced History of India,** Macmillan, New Delhi, 2002.

10.Vincent A. Smith, **The Oxford History of India,** OUP, New Delhi, 2002.

Teaching Learning Method

PPT, Seminar, Assignment, Quiz Programme

Course Outcome

Students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Recall the Turkish rules in India	K1
CO2	Illustrate the Political and administrative system of Delhi Sultanate	K2
CO3	Assess the administrative and Economic reforms of Mugal Empire	K3
CO4	Identify the impact of the Regional Kingdom	K4
CO5	Summarize the social contribution of the Bhakthi 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	3	2	1	3	3	2	1	2	1				21
CO2	2	3	2	3	3	3	2	3	2	2	2	1	2	30
CO3	2	3	1	3	3	3	3	3	1	3	3	1	2	31
CO4		2		2	2	2	1	2	1	3	3	1	1	20
CO5		3		1	1	2	1		3	1	1			13
Grand Total of COs with PSO and POs														115
Mean Value of COs with PSO and POs = $\dfrac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \dfrac{115}{55} = 2.09$														2.09

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			2.09
Observation	COs of History of India II Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.
DEPARTMENT OF HISTORY

Class	: II B.A (History)	Part	: III Allied -3
Semester	: III	Hours	: 75
Sub .Code	: 22UHSA33	Credits	: 04

SOCIAL HISTORY OF INDIA

(Students admitted from the Academic Year 2022 – 2023 onwards)

Course Objectives: To make the students to
1. understand the fundamental social institutions of India.
2. Classify the marriage and family life of Ancient and Medieval India.
3. Critically analyze the evolution of educational progress in India.
4. Examine the status of women through the ages.
5. Review the age of social reforms in India.

Unit – I   **15 Hours**

People and Races of India – Unity in Diversity - Varnas – Origin – varnasamskara – Account of Fahien.

Unit – II: Marriage and Family   **15 Hours**

Vedic society – Patriarchy– Four Ashrams – Marriage – Vedic period – Rig and Later Vedic – Eight type of Marriages – Anuloma – Pratiloma– Endogamy in Muslim India – Muslim India – Husbands' Obligations Towards Wives.

Unit – III: Education   **15 Hours**

Vedic Period – Early Centers: Taxila – Kasi – Nalanda – Vikramashila – Kanchi – Jain's Contributions - Education under the Guptas- HarshaVardhana – I-tsing's Account –Hindu and Muslim education – British Education – Woods Despatch – Hunter Commission – Macaulay's Minute - Wardha System.

Unit – IV: Women through Ages   **15 Hours**

Brief Survey – Women – Rig Vedic Period – Unprivileged Women folk between 6th Century B.C to 4th Century B.C – Privileged Mauryan Women – Gupta Period- Sridhana- Honoured Rajput Women folk - Sufferings – Jauhar – Seclusion – Widowhood – Devadasi – Muslim Women – Polygamy – Child Marriage – Sati through ages - Property Rights.

Unit – V: **15 Hours**

Age of Social Reforms – Abolition of Infanticide – Legislation of 1793 and 1804 – Abolition of sati – William Bentinck – Abolition of Slavery (1843) - Widow remarriage Act (1856) - Child Marriage – Native Marriage Act(1872) – Age of Consent Act – (1891) – Infant Marriage Prevention Act – (1901) – Sharda Act (1930) – Upper garment agitation in Trarancore- Abolition of Untouchability – Mahatma Jothi Ba Phule.

Books for Study:
 1. Chandra Satish, **Medieval India**, NCERT, New Delhi, 1978.
 2.Chopra P.N., Puri, B.N. Das – **A Social, Cultural and Economic History of India, 3 – Vols.**
   Macmillan India, Madras1974.

3. Mahajan, V.D. **Ancient India,** chand& Co., Delhi 1975.

4. SarkarSmit, **Modern India**, Macmillan India, New Delhi 1986.

5. Sharma. R.S. **Ancient India**, NCERT, New Delhi 1977.

Books for References:

1. Kosambi, D.D. **Culture and Civilization of Ancient India**, Vom Education Boos, Delhi 1986.

2. Mahajan, V.D. **Medieval India**, Chand & Co., 1982.

3. Mahajan, V.D. **India since 1526**, Chand & Co., Delhi 1978.

4. Spear Percival, **History of India, vol II**, Pengin Books, Delhi, 1985.

5. ThaparRomila, **History of India vol- 1**, Pengium Books New Delhi, 1966.

Teaching Learning Methods

Lecture Method

Power Point Presentation

Group Discussion

Seminar

Assignment

Quiz

Course Outcome

Students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Recall the People and Races of India.	K1
CO2	Summarize the social life of Ancient India.	K2
CO3	Point out the growth of education in India	K4
CO4	Discover the condition of Indian women in different periods	K3
CO5	Summarize the social evil practices and its legal remedies.	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	2				2	3	3	2	2	2			18
CO3	3	3	2	2	2	3	2	2	2	2	3	2	2	30
CO4	2	2	2	2	2	2	2	2			2	2	2	22
CO5	2	2	3	3	3	2	3		2	2	2	2	3	29
Grand Total of COs with PSO and POs														110

Grand total of COs with PSOs and POs   110

Mean Value of COs with PSO and POs = --- = ------- = 2.24

Number of COs relating with PSOs and POs   49

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			2.24
Observation	COs of History of Social History of India Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.
DEPARTMENT OF HISTORY

Class	: II B.A (History)	Part	: Core Elective - I
Semester	: III	Hours	: 60
Sub .Code	: 22UHSE13	Credits	: 03

HISTORY OF TAMILNADU I (UPTO 1336 AD)
(Students admitted from the Academic Year 2022 – 2023 onwards)

Programme Specific Objectives

To make the students

1. Understand the socio, economic and cultural condition of the Sangam Age.
2. Identify the contribution of Pallavas to art and architecture
3. Describe the cultural contribution of Pandyas
4. Evaluate the socio, economic condition of Tamil Nadu under the rule of Cholas
5. Explain the advent of Islam in Tamil Nadu.

Unit – I: Sangam Age   **12 Hours**

Physical features of Tamil Nadu and their influence on the course of history – Survey of various sources – Thinai Social order – Economic Condition – Sangam Literature- Cultural Contribution of Chera, Chola, Pandya.

Map: Archaeological sites in Ancient Tamil Country.

Unit - II: Kalabhras and Pallavas   **12 Hours**

Kalabhras –Pallavas – Social and Economic conditions– Art and Architecture– Bhakti Movement

Map: Cultural centers of the Pallavas

Unit - III: Pandyas   **12 Hours**

Early Pandyas – Later Pandyas – CholaPandya conflicts - Art and Architecture – Administration and Social life

Unit - IV: Imperial Cholas   **12 Hours**

Rajaraja – I and Rajendra – I – Polity - Socio and Economic conditions – Growth of Literature - Art and Architecture – Religion -. Administration.

Map: Important sites of Imperial Cholas

Unit - V: Madurai Sultanate   **12 Hours**

Invasion of the Malik Kafur – Fall of Pandyan Empire – Founding of Sultanate of Madurai - Art and Architecture.

Books for Study:

1. Pillai, K. K., **Social History of Tamils**, University of Madras, 1975.
2. Subramanian, N., **History of Tamil Nadu Upto 1336 AD**, Madurai, 2002.
3. Rajayyan, K., **History of Tamil Nadu**, Madurai, 1982.
4. Jeyabalan, N. **An Outline History of Tamil Nadu Till 1987**, M. S.Publication, Madras, 1986.

Books for Reference:

1. Srinivasan, K. R., **Temples of South India**, NBT, Delhi, 1995.
2. Mahalingam, T. V., **Administration and Social Life under Vijayanagar**, University of Madras, 1951.
3. MangalaMurugesan, N. **Social Cultural History of Tamil Nadu**, M. S.Publication, Madras,1986.
4. SrinivasaIyengar, P.T. **History of the Tamils**, Asian Educational Services, New Delhi,1982.
5. Champakalakshmi, R., **Urbanisation in South India**, Oxford, Delhi, 2003.

Teaching Learning Methods

Lecture Method, ICT, Seminar, Quiz

Course Outcome

Students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Illustrate the Geography of Tamil country and about Sangam Age	K2
CO2	Assess he role of Pallavas in Bakthi Movement	K3
CO3	Analyse about Second Pandya Empire and the	K4
CO4	Generalize the Empire and Art of Cholas	K5
CO5	Evaluate the Establishment of Madurai Sultanate	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	3	3	2	2	2			18
CO2	2	2				1	2	2	3	3	2			17
CO3	3	3	2	2	2	2	2		2	2	3			23
CO4	2	2	3	3	3	2	3		2	2	2	3	3	30
CO5	2	2	3	3	3	3	2		2	2	2	3	3	30
Grand Total of COs with PSO and POs														118

Grand total of COs with PSOs and POs   118
Mean Value of COs with PSO and POs = -- = ------- = 2.36
Number of COs relating with PSOs and POs   50

2.36

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			2.36
Observation	COs of History of Tamil Nadu I Strongly related with PSOs and POs		

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

Class	: UG Other Science	Part	: III NME-1
Semester	: III	Hours	: 45
Sub-Code	: 22UHSN13	Credits	: 02

HISTORY OF FREEDOM STRUGGLE IN INDIA
(Students admitted from the Academic Year 2022 – 2023 onwards)

Course Objectives: To make the students to
1. Recall the emergence of the National Movement in India.
2. Describe the values of Socio-Religious-Reforms Movement.
3. Evaluate the role of Gandhi in the Indian Freedom Struggle.
4. Appraise the last stage of the Indian Independence.
5. Criticize the impact of communalism in the Indian National Movement.

Unit – I   **9 hours**
Rise of Nationalism – Causes for National Awakening – Early uprisings in North - South Indian Rebellion – Vellore Mutiny.

Unit – II   **9 hours**
1857 Mutiny –Indian National Congress – Muslim League – Surat split – Moderates – Extremist - Swadeshi Movement – Rise of Revolutionary Terrorism – Impact of Socialism and Communism.

Unit – III   **9 hours**
Gandhian Era – Coming of Gandhi – Ideals and Practices - Non-Co-operation Movement – Swaraj Party – Simon Commission – Birth of Communist Party of India – 1928 All Party Congress – PoornaSwaraj 1929 – Civil Disobedience Movement - Round Table Conferences

Unit – IV   **9 hours**
Towards Independence – Subash Chandra Bose – INA – Cripps Mission – Quit India Movement – Cabinet Mission Plan - Jinnah – Two Nation Theory – Mountbatten Plan - Partition – Independence.

Unit – V   **9 hours**
Communalism and National Movement – Early Ideologies – Revival of Communal Practices – Ganesh Festival – Durga - Shivaji Festival – Hindu MahaSabha – Muslim reaction – Communal Holocaust.

Books for Study
1. AroraPrem**, Constitutional Development and National Movement in India,** Book Hives, Delhi, 2005.
2. Bipan Chandra**, India's Struggle for Independence,** Penguin, New Delhi, 1999**.**
3. Sen. S.N, **History of the Freedom Movement of India,1857-1947**, New Delhi, 1989.

4. SumitSarkar**, Modern India (1885-1974),** Macmillian, New Delhi, 1986**.**
5. Venkatesan, G., **History of Freedom Struggle in India**, V.C. Publication, Rajapalayam, 2006.

Books for References

1. JagannathSarkar and A.B. Baradhan**, India's Freedom Struggle–Several Streams,** Peoples Publishing House, New Delhi, 1999.
2. Jim Maselos**, Indian Nationalism An History**, Sterling Publication, Delhi, 1991.
3. *Krishna Mohan.* Encyclopaedic History of Indian *Freedom Movement*, . 4vols, Anmol Publications, New Delhi 1999.
4. Maulana Azad**, India Wins Freedom,** Orient Longman, Madras, 1988.
5. Rajkumar, **Essays on Indian Freedom Movement**, Discovery Publication House, 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	Recall the concept of nationalism and causes for the national awakening	K1
CO2	Classify the ideas and practices of the Moderates and Extremists	K2
CO3	Point out the significance of the Gandhian Era	K4
CO4	Summarize the role Subash Chandra Bose and Indian National Army	K6
CO5	Evaluate communalism and National Movement	K6

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	1	1	1			10
CO2	2	2	2	2	2	2	3	3	2	2	2			24
CO3	3	3	2	3	3	3	2	2	2	2	3	2	2	32

CO4	2	2	2	2	3	2	2		3	2	2	3	2	27
CO5	2	2	3	3	3	2	3		2	2	2	2	2	28
Grand Total of COs with PSO and POs														121

Mean Value of COs with PSO and POs = $\dfrac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \dfrac{121}{54} = 2.24$

	2.24

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			2.24
Observation	COs of History of Freedom Struggle in India Strongly related with PSOs and POs		

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

Class	: U.G. (Aided)	Part	: Self Learning Course
Semester	: III	Hours	: --
Sub. Code	: 22UHSSL3	Credits	: 03

HISTORY OF ANCIENT SCIENCE AND TECHNOLOGY
(Students admitted from the Academic Year 2022 – 2023 onwards)

Objective : 1. To make the students understand the development of Ancient Science and Tech in the World.
2. To enable the students prepare for Competitive Examinations

UNIT – I

Hellenic Science and Technology, Thales, Pythagoras, Hippocrates, Eratosthenes, Euclid, Archimedes.

UNIT – II

Roman Science &Technology - Galen, Roman roads and Transportation (Bridges&Aqueducts).

UNIT – III

Indian contribution – Ancient and Medieval Indian Science and Technology – Astronomy and Medicine etc.

UNIT – IV

Ancient Chinese Technology – Porcelain – Lacquering – Paper and Printing – Maps – Navigation – Causes for Decline.

UNIT – V

Arab medicine and Alchemy – Avicenna.

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^(nd) 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 MateriaMedica**, Popular Prakashan, Bombay, 1976.**
4. AriviyalKalanjiam (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	Recognise the ancient Greece inventions	K1
CO2	Explain the Roman Technology	K2
CO3	Assess the Ancient and Indian Science	K3
CO4	Compare the Science of Chinese into Science of Indians	K4
CO5	Evaluate the Scientific achievements of Arabs	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	1	1				14
CO2	2	2				3	3	3	2	2				17
CO3	2	2				1	2	2	3	3	2	1	1	19
CO4	3	3	2	2	2	3	3		2	2	3	2	2	29
CO5	2	2	3	3	3	2	3		2	2	2	3	3	30
Grand Total of COs with PSO and POs														109
Mean Value of COs with PSO and POs= $\dfrac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}}$ = $\dfrac{109}{48}$ = 2.27														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 PSO and POs			2.27
Observation	COs of History of Science and Technology Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.
DEPARTMENT OF HISTORY

Class	: II B.A (History)	Part	: III/Core - 6
Semester	: IV	Hours	: 75
Sub .Code	: 22UHSC64	Credits	: 05

HISTORY OF INDIA – III
(From 1707 – 1857 AD)
(Students admitted from the Academic Year 2022 – 2023 onwards)

Programme Specific Objectives

Make the students

❖ To recall the political significance of Later Mughals
❖ To understand the congenial condition for the coming of the Europeans and the establishment of their settlements.
❖ To appreciate reforms of the various Governors Generals and to recognize the administrative developments during the British period.
❖ To examine the causes of the various wars and to understand the various tactics and diplomacy of the British to win the Indian rulers.
❖ To inculcate the poverty of Indian Economy under the British Rule

Unit- I:Later Mughals and After

Later Mughal – The Rise of Autonomous States: Hyderabad – Bengal – The Carnatic – Mysore – Punjab – Maratha Power under the Peshwas – The Afghans

Unit- II: Advent of the Europeans 15 Hours

Portuguese, Dutch and the Danish settlement – French settlements – Dumas and Dupleix – British settlement – Anglo – French Rivalry – Carnatic Wars – Battle of Plassey, Battle of Buxar – Robert Clive.
Map Study: Important centres of Carnatic Wars.

Unit-III: Governor Generals of India 15 Hours

Warren Hastings – Rohilla War – Reforms – Impeachment – Cornwallis – Permanent Revenue Settlement – Lord Wellesley – Subsidiary system – Lord William Bentinck – Lord Dalhousie – Doctrine of Lapse.
Map Study: Lord Wellesley's Empire in India.

Unit-IV: Expansion of the British Empire in India 15 Hours

Anglo-Maratha Wars and decline of Peshwas – Anglo-Mysore wars – Anglo-Burmese wars – Anglo-Sikh Wars – Anglo-Afghan Wars.
Map Study: Important places of Anglo-Maratha Wars.

Unit-V: Economic Impact of British Raj 15 Hours

De-Industrialization –Decline of Indian Handicrafts – Impoverishment of Peasantry – Commercialization of Indian Agriculture – New Land Tenures and Land Revenue Policy – The Drain of Wealth – Growth of Landless labour – Rise of Modern Industry

Teaching Learning Methods

Lecture Method, ICT, Seminar, Quiz

Books for Study

1. Bhattacharya, Sabyasachi.ed.,**Rethinking 1857**, Orient Longman, Delhi, 2007.
2. Guha, Ranajit, **Elementary Aspects of Peasant Insurgency in Colonial India**, New Delhi, Oxford 2003.
3. Ghosh Suresh Chandra, **The History of Education in Modern India 1757-2012**, , Orient Blackswan, 4th Edition ,Delhi, 2013.
4. Sinha, N.K.ed**, The history of Bengal 1757-1905**, Calcutta University Press , Calcutta, , 1967

Books for Reference

1. Smith, V. A., **Oxford History of India**, OUP, New Delhi, 2002.
2. Majumdar, R. C. Et al., **An Advanced History of India**, Macmillan, New Delhi, 2002.
3. Grover, B. L. And Grover, S., A **New Look at Modern Indian History**, S. Chand & Co., New Delhi, 2004.
4. SumitSarkar, **Modern India**, Macmillan, New Delhi, 2004.

Course Outcome

Students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Recognize the prominence of Regional Kingdoms of India	K2
CO2	Illustrate the advent for the Europeans and their settlements	K3
CO3	Demonstrate the administrative developments in India during British Period	K4
CO4	Analyse about the tactics and diplomacy of the British to win the Indian rulers.	K5
CO5	Evaluate Drain of wealth in India by the British	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	1				2	3	3	2	2	1			15
CO2	2	2				2	2	2	3	3	2			18
CO3	3	3	2	2	2	1	2		2	2	3	2	2	26
CO4	2	2	3	3	3	2	1	1	2	2	2	3	3	29
CO5	2	2	3	3	3	2	1	1	2	2	2	3	3	29
Grand Total of COs with PSO and POs														117
Mean Value of COs with PSO and POs = $\dfrac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \dfrac{117}{54} = 2.16$														

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 PSO and POs			2.16
Observation	COs of History of India IV Strongly related with PSOs and POs		

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

Class	: II B.A (History)	Part	: III Allied -4
Semester	: IV	Hours	: 75
Sub .Code	: 22UHSA44	Credits	: 04

MAIN CURRENTS OF MEDIEVAL EUROPE
(Students admitted from the Academic Year 2022 – 2023 onwards)

Programme Specific Objectives
Make the students
1. To identify the Cultural Heritage of Byzantine Empire
2. To analyse the Problems between Roman Empire and Papacy
3. To Critisize the Events of Hundred Years War
4. To Evaluate the Rise and Spread of Islam
5. To Examine the Emerge of Parliament, Monasteries and Universities

Unit: I   **15 Hours**
        Byzantine Empire – Constantine I - Justinian – Cultural Heritage – **Frankish Kingdom** – Charlemagne – Carolingian Renaissance.

Unit: II   **15 Hours**
        Holy Roman Empire – Struggle between Papacy and Empire – Causes – Course- Result

Unit: III   **15 Hours**
        Hundred Years War – Causes – Course - Results – Joan of Arc.

Unit: IV   **15 Hours**
        Rise and spread of Islam – Legacy – Crusade – Causes – Course - Result

Unit: V Positive Trends: Laying Foundation of Democracy   **15 Hours**
        a. Genesis of Parliament – England – Witan – Magnum Concilium – Magna Carta – Provisions – Model and Good Parliament – Apprenticeship under the Tudors.
        b. Education and Arts – Monasteries – Universities in Medieval Europe.

Books for Study:
1. Jeyapalan. N, **History of Europe**, Mohan Publishers, Madurai, 1987.
2. Ramalingam. T.S., **History of Europe**, (476 - 1485), T.S.R. Publications, Madurai, 1980.

References:
1. Durant Will, **Story of Civilization**, Caesar, Christ and Age of Faith, Will Durant Foundation, USA, 2002.
2. Fisher. H.A.L, **History of Europe**, Vol.I, Surjeet, New Delhi, Fisher Hall, 1986.
3. Swain J.E, **History of World Civilization**, Eurasia Pub, II Ed, New Delhi, 1994.

Teaching Learning Methods
Lecture Method, ICT, Seminar, Quiz

Course Outcome

Students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Classify the Culture and the Emerge of Renaissance movement in Medieval Europe	K2
CO2	Illustrate the Causes of Papacy and Empire	K2
CO3	Analyse the Hundred Years War	K4
CO4	Organise the Rise and Spread of Islam in Europe	K4
CO5	Criticise the Genesis of Parliament, Monasteries and Universities	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	3	3	2	2				16
CO2	2	2				2	3	3	2	2				16
CO3	3	3	2	2	2	2	2	1	2	2	3	2	2	28
CO4	3	3	2	2	2	2	2	1	2	2	3	2	2	28
CO5	2	2	3	3	3	2	1	1	2	2	2	3	3	29
Grand Total of COs with PSO and POs														117
Grand total of COs with PSOs and POs 117 Mean Value of COs with PSO and POs = --- = ------- = 2.20 Number of COs relating with PSOs and POs 53														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 PSO and POs			2.20
Observation	COs of Main Currents of the Medieval Europe Strongly related with PSOs and POs		

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

Class	: II B.A (History)	Part	: Core Elective - 2
Semester	: IV	Hours	: 60
Sub .Code	: 22UHSE24	Credits	: 03

HISTORY OF TAMILNADU II (FROM 1336 to present day)
(Students admitted from the Academic Year 2022 – 2023 onwards)

Programme Specific Objectives

Make the students

1. To study the social and political contribution of Vijayanagar rule in Tamil Country.
2. To understand the changes after the British Acquisition of Tamil Nadu.
3. To Criticise the Colonial Economy and Revenue Policy in Tamil Nadu.
4. To analyze the relevance of socio – religious movements of the 19th century.
5. To study the Dravidian Movement and its impact in Tamil Nadu

Unit I: Vijayanagar rule in Tamil Country   **12 Hours**

Tamil Country under Vijyanagar – Conquests of Kumara Kampana in Tamil Nadu – Art and Architecture – Nayankara system – Economic and Cultural contributions of Vijayanar in Tamil Country.

Unit II: Nayaks Marathas and Carnatic Nawabs   **12 Hours**

Nayaks of Tanjore and Gingee Polity – Socio – Cultural conditions – Marathas of Tanjore – Polity – Socio – Cultural contributions – Carnatic Nawabs – Polity – Socio – Cultural conditions.

Maps: Identify the following places and write a short note on - Tirunelveli, Tanjore, Kumbakonam, Gingee, Arcot.

Unit III: Tamil Nadu under British   **12 Hours**

Colonial Economy – Revenue Policy-Jamindari-Ryatwari – Judicial Administration – Police Administration - Western Education.

Maps: Salem, Chennai.

Unit IV: Reform Movements and National Movement   **12 Hours**

Vaikundaswamy – RamalingaAdigal – Role of Press-Devadasi System – Freedom Struggle – Political and Social awakenings – National Movement – Role of Tamilagam

Maps: Identify the following places and write a short note - Kanyakumari, Vadalur.

Unit V: Self – Respect Movement and Present Tamil Nadu   **12 Hours**

Struggle for Social equality – Justice Party and Self Respect Movement –Congress Government after Independence - Kamaraj's Contribution to Society – Dravidian Parties - Agricultural and Industrial Developments – Educational and Social Developments.

Books for Study:

1. Anil Seal, **The emergence of Indian Nationalism**, New Delhi, 1980.

2. Yesudhasan, V. &IssacJeyadhas, **History of Tamil Nadu: Society and Culture since 1936**, Oxford University Press, New Delhi, 1990.

3. Rajayyan, K., **Real History of Tamil Nadu**, Madurai, 2005.

Books for Reference:

1. David Arnold, **The Congress in Tamil Nadu (1919 - 1937)**, New Delhi, 1977.

2. Eugene, F. Irschick, **Politics and Social Conflict in South India**, Bombay, 1964.

3. Herd Grave, Robert, L., **TheNadars of Tamil Nadu: The Political Culture of a Community in Change**, California, 1969.

4. Sundharalingam, **Politics and Nationalist Awakening in South India,** New Delhi, 1980.

Teaching Learning Methods

Lecture Method, ICT, Seminar, Quiz

Course Outcome

Students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Explain the Nayaks of Madurai, Tanjore and Senji	K2
CO2	Demonstrate the establishment of the British rule in Tamil Nadu and Vellore mutiny.	K3
CO3	Analyse the Economy under British rule in Tamil Nadu	K4
CO4	Identify the socio- religious reform movements in Tamil Nadu.	K4
CO5	Summarise the Socio, Economy and Educational Development in Tamilnadu after Independence	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	3	3	2	2	2			18
CO2	2	2				1	2	2	3	3	2			17
CO3	3	3	2	2	2	2	2		2	2	3	2	2	24
CO4	3	3	2	2	2	2	3		2	2	3	2	2	28
CO5	2	2	3	3		3	2	2	2	2	2	3	3	29
Grand Total of COs with PSO and POs														116
Mean Value of COs with PSO and POs = $\dfrac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \dfrac{105}{50} = 2.32$														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 PSO and POs			2.32
Observation	COs of History of Tamil Nadu II Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.
DEPARTMENT OF HISTORY

Class	: UG OTHER ARTS	**Part**	: IV NME-2
Semester	: IV	**Hours**	: 45
Sub .Code	: 22UHSN24	**Credits**	: 02

CONSTITUTION OF INDIA
(Students admitted from the Academic Year 2022 – 2023 onwards)

Course 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 functioning of the Council of Ministers.
4. Critically analyze the exercises of the parliament of India.
5. Assess the powers and functions of the Supreme Court.

Unit – I   **9 Hours**
Brief History –Constitution –Definition-Types- Salient Features of the Indian Constitution – Preamble – Amendment Procedure –Fundamental Rights and Duties – Directives Principle of state Policy – Election Commission – Political Parties – Pressure Groups.

Unit –II   **9 Hours**
Union Executive: President – Powers –Functions –Privileges – Vice – President – Powers and Functions.

Unit – III   **9 Hours**
Prime Minster: Powers and Functions – Cabinet –Bureaucracy.

Unit – IV   **9 Hours**
Union Legislatives: LokSabha - RajyaSabha –Powers –Functions – process of law making – speaker of LokSabha and his functions.

Unit -V   **9 Hours**
Indian Judiciary: Powers and Functions – Judicial Review

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, 13th 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, 6th Ed., 1994.
2. BasuDurga Das, **Introduction to the constitution of India**, 19thed, Wadhwa & Company, Delhi, 2005.
3. BhagwanVishoonandBhushanVidya, **World Constitutions**, III Revised, 19[th]ed , Sterling Publication, Bangalore, 1987.
4. Raj Hans, **Constitution of India**, Surjeet Publication, Delhi, 1990.
5. Rajaram Kalpana (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

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Recall the salient features of the Indian Constitution	K1
CO2	Classify the powers and functions of the President and Vice President of India.	K2
CO3	Examine the powers and functions of the Union Executives	K3
CO4	Point out the process of law making	K4
CO5	Summarize the functioning of the Indian Judiciary	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						3	2	2	2	2				11
CO2	2	2				2	3	3	2	2				16
CO3	2	2				1	2	2	3	3	2	2		19
CO4	3	3	2	2	2	3	2		2	2	3	2	2	28

CO5	2	2	3	3	3	2	1		2	2	2	3	3	28
Grand Total of COs with PSO and POs														112

Mean Value of COs with PSO and POs = $\dfrac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \dfrac{112}{45} = 2.48$

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			2.48
Observation	COs of Constitution of IndiaStrongly related with PSOs and POs		

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

Class : U.G. (Aided)   Part   : Self Learning Course
Semester : IV   Hours : --
Sub. Code: 22UHSSL4   Credits : 03

INDIAN HISTORY FOR COMPETITIVE EXAMINATIONS –I
(Students admitted from the Academic Year 2022 – 2023 onwards)

Course Educational Objectives
To make the students
1. Recall the ancient civilization in India.
2. Classify the significance of the Mauryan Empire, Nandas and Sungas.
3. Appreciate the contribution of Guptas to Indian Culture.
4. Examine the historical values of the South Indian kingdoms.
5. Recall the invasion of Arabs in India.

UNIT – I
Indus Valley Civilization – Aryans – Vedic Civilization.
UNIT - II
Nandas – Mauryas – Sungas.
UNIT – III
Kushans – Guptas – HarshaVardhanas.
UNIT - IV
Pallavas – Pandyas – Cholas.
UNIT - V
        Invasion of Arabs – Gazni – Ghor – Delhi Sultanate – Slaves – Khiljis –
Tughluqs – Sayyid – Lodis – First Battle of Paniput.
Books for Study:
1. Mahajan, V.D. - History of India (upto 1526), Chand & Co Publication, Delhi, 1980.
2. Chandra Satish   -   Medieval India, NCERT Publication, New Delhi, 1988.
3. Sharma, R.S. – Ancient India, NCERT, New Delhi, 1977.

Course Outcome
Students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Classify the significance of the Ancient Civilization of India.	K2
CO2	Explain emergence of Buddhist kingdoms in India	K3

CO3	Illustrate the Golden Age of India	K3
CO4	Analyse the administrative system of Pallava, Pandya and Cholas.	K4
CO5	Summarize the establishment of the Sultanate 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	2	2				2	3	3	2	2				16
CO2	2	2			1	2	2	2	3	3	2	1	1	21
CO3	2	2			1	3	2	2	3	3	2	1	1	22
CO4	3	3	2	2	2	2	3		2	2	3			24
CO5	2	2	3	3	3	3	2		2	2	2	3	3	30
Grand Total of COs with PSO and POs														113
Mean Value of COs with PSO and POs = $\dfrac{\text{Grand total of COs with PSOs and POs}}{\text{Number of COs relating with PSOs and POs}} = \dfrac{113}{51} = 2.21$														2.21

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			2.21
Observation	COs of India Struggle for Freedom Strongly related with PSOs and POs		

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	**Nature of the Course**		**Title of the Course**	**Hrs**	**Credit**
		I Semester			
I	Part – I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil/ Hindi/French	06	4
II	Part – II	22UENA11 22UENB11	English	05	4
III	Core – 1	22UECC11	Microeconomics – I	06	5
	Core – 2	22UECC21	Macroeconomics – I	06	5
	Allied – 1	22UECB11	Economic Statistics – I	05	4
IV	FC – I	22UFCE11	FC – I Personality Development	01	01
		22UBRC11	Bridge Course	-	1
		22UCSH12	Communication Skills	01	
V	Extension Activities	22UNCC/NSS/ PHY.EDU/YRC/ ROT/ACF/ NCB12	NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
		Total		**30**	**24**
		II Semester			
I	Part – I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil /Hindi /French	06	4
II	Part – II	22UENA22 22UENB22	English	05	4
III	Core – 3	22UECC32	Microeconomics – II	06	5
	Core – 4	22UECC42	Macroeconomics – II	06	4
	Allied – 2	22UECB22	Economic Statistics – II	05	4
IV	FC – II	22UFCH22	Social Responsibility and Global Citizenship	01	1
		22UCSH12	Communication Skills	01	1
V	Extension Activities	22UNCC/NSS/ PHY.EDU/YRC/ ROT/ACF/ NCB12	NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
		Total		**30**	**24**

			III Semester		
I	Part – I	22UTAL13/ 22UHNL13/ 22UFNL13	Tamil /Hindi /French	06	4
II	Part – II	22UENA33/ 22UENB33	English	06	4
III	Core – 5	22UECC53	Monetary Economics	05	4
	Allied – 3	22UECA33	Principles of Accountancy	05	4
	Core Elective – 1	22UECE13	Managerial Economics / Principles of Management	04	3
IV	Non-major Elective – 1	22UECN13	Elements of Indian Economy	03	2
	FC – III	22UFCE33	Environmental Studies	01	01
V	Extension Activities	22UNCC/ NSS/PHY.EDU /YRC/ROT/ ACF/NCB24	NSS / NCC / Phy. Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
		22UARE14	ARISE	-	-
Total				**30**	**22**
			IV Semester		
I	Part – I	22UTAL14/ 22UHNL14/ 22UFNL14	Tamil /Hindi /French	06	4
II	Part – II	22UENA44/ 22UENB44	English	06	4
III	Core – 6	22UECC64	Banking	05	5
	Allied – 4	22UECA44	Accounting for Management	05	4
	Core Elective – 2	22UECE24	Quantitative Aptitude / Verbal and Non-Verbal Reasoning	04	3
IV	Non – Major Elective	22UECN24	Comparative Economic System	03	2
	FC – IV	22UFCH44	Religious Literacy / Peace Ethics	01	1
V	Extension Activities	22UNCC/NSS /PHY.EDU/ YRC/ROT/ ACF/NCB24	NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
		22UARE14	ARISE	-	1
Total				**30**	**25**
			V Semester		
III	Core – 7	22UECC75	Fiscal Economics	05	5
	Core – 8	22UECC85	Mathematical Methods	05	4
	Core – 9	22UECC95	International Economics	05	4
	Core – 10	22UECD05	History of Economic Thought	05	4
	Core – 11	22UECD15	Marketing Management	05	4

		22UINT15	Internship (Holidays – 25 Days)	0	1
IV	Skill Based Elective – I (Theory)	22USBZ15	Fundamental of Computer, Internet and Office Automation	01	1
	Skill Based Elective – I (Practical)	22USBY15	Fundamental of Computer, Internet and Office Automation	02	1
		22USSI16	Soft Skills	02	-
Total				**30**	**24**
VI Semester					
III	Core – 12	22UECD26	Indian Economy	05	5
	Core – 13	22UECD36	Mathematical Economics	05	4
	Core – 14	22UECD46	Development Economics	05	4
	Core – 15	22UECD56	Environmental Economics	05	4
	Core – 16	22UECD66	Demography	05	4
IV	Skill Based Elective – II (Theory)	22USBZ26	Web Design	01	1
	Skill Based Elective –II (Practical)	22USBY26	Web Design	02	1
		22USSI16	Soft Skills	02	2
Total				**30**	**25**

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

Self-Learning Courses - Additional Credits

Semester	Title	Credits
III	Economics of social problems in India	3
IV	Labour problems and social welfare	3
V	Marxian economics	3
VI	Economic reforms in India	3

PROGRAMME OUTCOMES (Common for all UG)

On completion of the 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 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 OUTCOMES

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

PSO1: Identify the core economic concepts and theories.

PSO2: Correlate the economic theories and concepts with real life situations.

PSO3: Predict the future economic events by applying economic models.

PSO4: Apply the different economic policies at different economic environment.

PSO5: Exercise the subject knowledge of Economics to get employment and opportunities in higher education.

DEGREE : B.A. Economics		**CLASS : II Year**
SEMESTER : III		**HOURS : 75**
SUBJECT CODE : 22UECC53		**CREDITS: 04**

CORE: MONETARY ECONOMICS

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

Course Educational Objectives (CEO):

- To familiarise with the concepts of money, inflation and Trade cycle
- To analyse the economic implications of Money
- To know the links between inflation and liquidity
- To understand different theories of money and apply them in real world
- To realise the dimensions of trade cycle

UNIT – I: EVOLUTION AND FUNCTIONS OF MONEY **(15 Hours)**

Barter System: Meaning – Difficulties – Evolution of Money – Definitions of Money – Classification of Money – Functions of Money – Significance and Defects of Money – Gold Standard: Meaning – Causes for the Breakdown of Gold Standard – Gresham's Law – Paper Currency Standard – System of Note Issue.

UNIT – II: THEORIES OF MONEY **(15 Hours)**

Value of Money: Meaning – Standards in measuring value of money - Fisher'sQuantity Theory of Money- Cambridge Equations – A Comparison of Fisher's and Cambridge Equations – Keynes' Reformulated Quantity Theory of Money - Milton Friedman's Restatement of Quantity Theory of Money

UNIT – III: DEMAND AND SUPPLY OF MONEY **(15 Hours)**

Measures of Money Supply – Determinants of money supply - Theory of Money Supply – H Theory – Demand for Money: Meaning – Liquidity Preference Theory of Money

UNIT – IV: INFLATION, DEFLATION **(15 Hours)**

Inflation: Meaning – Types – Causes and Effects – Uses of WPI and CPI - Inflationary Gap– Measures to control Inflation - Deflation: Meaning – Causes – Effects – Measures to control Deflation – Stagflation: Meaning – Causes – Effects– Measures to control Stagflation – Demonetisation (Concept only)

UNIT - V:MONETARY POLICY AND TRADE CYCLE **(15 Hours)**

Monetary Policy: Meaning – Objectives – Economic Growth and Conflicting Objectives of Monetary Policy – Role of Monetary Policy in Developing Economy - Trade Cycle: Meaning – Features – Phases of Trade Cycle - Effects - Control of Trade Cycle.

Books for Study:

1. Seth M.L. Monetary Economics, Lakshmi NarainAgarwal, Agra, 2018
2. Sethi, T.T., Money, Banking and International Trade, S. Chand, New Delhi, 2017
3. Nath H S, Monetary Economics: An Introductory Text, KhelSahitya Kendra (K.S.K. Publishers & Distributors), New Delhi, 2016

Books for Reference:

1. JordiGali, Monetary Policy, Inflation, and the Business Cycle: An Introduction to the New Keynesian Framework and Its Applications, Princeton University Press, 2015
2. Harry G Johnson, Essays in Monetary Economics (Collected Works of Harry Johnson), Routledge, New Delhi, 2013
3. Mervyn Lewis, Paul Mizen, Monetary Economics, Oxford University Press, London, UK, 2000

Web Sources
- https://www.economicsdiscussion.net
- https://www.investopedia.com
- https://www.yourarticlelibrary.com

Teaching and learning methods:
- Lecture
- Reading the text
- Summaries each segment
- Class presentation

Course Outcomes

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

SL.NO	COURSE OUTCOMES	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO_1	Narrate the evolution of money.	K_1
CO_2	Illustrate the determinants of the demand and supply of money.	K_2
CO_3	Analyze the impact of inflation and deflation	K_4
CO_4	Examine the role of monetary policy in Developing Economy	K_4
CO_5	Critically analyse the effect of each phases of trade cycle on Developing economy	K_5

K_1= Knowledge, K_2= Understanding, K_3= Application, K_4= Analysis and K_5= Synthesis

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	1	1	2	1		2	3	-	1	-	1	-	14
CO2	3	2	3	2	1		3	3	-	1	-	1	1	20
CO3	2	1	-	1	-		3	2	-	1	-	1	1	12
CO4	3	3	2	1	-		2	2	-	2	1	1	1	18
CO5	3	2	-	2	1		1	2	-	1	1	1	1	15
Grand total of COs with PSOs and POs														79
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = \left(\frac{79}{47}\right)$														1.68

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		1.68	
Observation	**COs of Monetary Economics in relation with PSOs and POs is medium**		

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

DEGREE	: B.A. Economics	CLASS	: II year
SEMESTER	: III	HOURS : 75	
SUBJECT CODE	: 22UECA33	CREDITS: 04	

ALLIED : PRINCIPLES OF ACCOUNTANCY

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

Course Educational Objectives (CEO):
- To understand the principles of accounting
- To acquire the knowledge, skills on tools of intermediate and financial accounting.
- To familiarize the aspects of money transactions
- To find the final fund of business and non-business enterprise
- To use the modern accounting software

UNIT - I   FUNDAMENTALS OF ACCOUNTING   (15 Hours)
Accountancy: Meaning - Objectives - Advantages -Important Terms - Double Entry System Rules – Preparation of Journals – Ledger.

UNIT - II CASH BOOK AND TRAIL BALANCE   (15 Hours)
 Cash Book: Meaning - Types of Cash Book- Single Column, Double Column, & Triple Column Cash Book Trial Balance- Meaning –Objectives – Methods – Preparation of Trail Balance.

UNIT - IIIACCOUNTING FOR SOLE TRADER   (15 Hours)
Sole Trader: Meaning - Advantages - Preparation of Trading and Profit & Loss Account and Balance Sheet of a Sole Trader from a given Trial Balance with Simple Adjustments.

UNIT - IV   ACCOUNTS FOR NON –PROFIT ORGANIZATIONS   (15 Hours)
Receipts & payments Account and Income and Expenditure Account: Meaning – Types -Difference between Receipts & payments Account and Income & Expenditure Account – Preparation of Income and Expenditure Account – Balance sheet (Elementary Problems Only)

UNIT-V   INTRODUCTION TO ACCOUNTING SOFTWARE   (15 Hours)
Tally: Meaning – Objectives - Features - Company Information- Creation of a Company-Accounting Information- Creation of Ledger (Single or Multiple) - Voucher: Meaning - Types of Voucher - Inventory Voucher – Accounting Voucher. Voucher Entry - Configuration Accounts Voucher- Report of Tally

Books for Study
1. Grewal,T.S., Double Entry System, Sultan Chand& Sons .New Delhi. 2017.
2. Mukherjee, A. and M. Hanif, Modern Accountancy (Volume - I), Tata McGraw Hill Education Private Limited. New Delhi. 2018
3. Ramasamy. T. Financial Accounting, Gold Book publishing house. Srivilliputtur, 2018
4. Dr,NamrataAgrawal, , Tally 9, Dreamtech Press, New Delhi, 2015

Book for References
1. Gupta, R.L., Advanced Accountancy (Volume -I), Sultan Chand & Sons, New Delhi, 2017
2. Arulanandam& Raman, Advanced Accountancy, Chand & Co., New Delhi, 2012
3. Shukla, M.C.&Grewal, T.S., Advanced Accountancy, Sultan Chand & Sons, New Delhi 2016
4. Tally 9 Financial Accounting & Inventory Management System, Ramaiah Publications, Chennai, 2010

Website for References
1.https://www.principlesofaccounting.com
2. https://www.investopedia.com
3. https://www.naukri.com

Teaching and learning methods:
- Lecture
- Workout
- Summaries each segment
- Class presentation

Course Outcomes

After completion of course Principles of Accountancy the student will be able to

SL.NO	COURSE OUTCOMES	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Recalling fundamental concepts in Accounting and able to fit business transaction into ledger	K2
CO2	Asses and determine the cash transactions of business and prevent in Accounting statement and prepare the trail balance	K2
CO3	Illustrate and solving the final account of sole trader business	K4
CO4	Construct and Synthesize the preparation of non-trading accounts	K4
CO5	Demonstrate the accounting software in business	K3

K_1= Knowledge, K_2= Understanding, K_3= Application, K_4= Analysis and K_5= Synthesis

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	-	3	2	2	1	2	2	3	2	1	25
CO2	2	2	3	-	3	3	3	1	2	2	2	1	1	25
CO3	1	2	2	-	3	2	2	-	2	2	3	-	1	20
CO4	2	1	1	-	2	2	2	1	2	1	1	1	1	17
CO5	2	1	1	-	3	2	2	1	2	2	2	1	1	20
Grand total of COs with PSOs and POs														107
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{107}{58})$														1.84

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		1.84	
Observation	**COs of Principles of Accountancy in relation with PSOs and POs is medium**		

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

DEGREE	: B.A. Economics	CLASS	: II year
SEMESTER	: III	HOURS	: 60
SUBJECT CODE	: 22UECE13	CREDITS	: 03

CORE ELECTIVE (1A): Managerial Economics

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

Course Educational objectives (CEO):
- To familiarize the need of Managerial Economics.
- To apply the economic concepts in the Managerial practices.
- To inculcate the economic ideas for business decision making.
- To illustrate the nuances of economic theories in business mechanism
- To enlighten the significance of the demand and profit forecasting.

Unit – I INTRODUCTION TO MANAGERIAL ECONOMICS **(12 Hours)**
Managerial Economics: Meaning – Definition – Nature – Scope –– Role of Managerial Economist – Managerial Economics and Business decision making – Fundamental Concepts of Managerial Economics – Difference between Managerial Economics and Economics – Objectives of Business firm.

Unit – II DECISIONS MAKING AND DEMAND FORECASTING **(12 Hours)**
Decision Making: Meaning – Business Decisions Making – Objectives of Business Firms – Demand Forecasting: Meaning – Objectives – Short run and Long run Forecasting – Methods of Demand Forecasting for Established Product – Criteria for Good Forecasting

Unit – III PRICING **(12 Hours)**
Pricing policy – Meaning – Objectives - Pricing– Meaning – Methods of Pricing – Factors affecting Pricing Decision – Meaning of Differential Pricing – Base for Price Differentials – Conditions for Price Differentials – Aims of Differential Price – Government Intervention and pricing

Unit – IV PROFIT **(12 Hours)**
Meaning of Profit – Distinctions between Super normal profit and Normal Profit and Accounting profit and Economic Profit – Meaning of Profit Planning – Methods of Profit Planning – Meaning of Profit Policy – Aims of Profit Policy – Approaches to Profit Forecasting

Unit – V BREAK EVEN ANALYSIS **(12 Hours)**
Break even Analysis: Meaning – Assumptions – Break Even Chart – Break Even Point – Shutdown Point – Calculation of Break Even Point In terms of: Physical Units – Sales Unit – Managerial Uses of Break Even Analysis

Books for Study:
1. Mithani D M, Managerial Economics : Theory And Applications, Himalaya Publishing House, New Delhi, 2020.
2. Mehta P L., Managerial Economics - Analysis , Problems And Cases., Sultan Chand & Sons, New Delhi, 2016.
3. Varshney R.L., Maheshwari K.L., Managerial Economics., Sultan Chand & Sons., New Delhi 2014.

Books for Reference:
1. Craig H. Peterson, W. Cris Lewis, and Sudhir K. Jain, Managerial Economics, Pearson Education India, New Delhi, 2005.
2. H. L. Ahuja, Managerial Economics, S Chand Publishing, New Delhi, 2017
3. Dominick Salvatore, Managerial Economics: Principles And Worldwide Applications, Oxford University Press India, New Delhi, 2020.

Websites for reference:
1. https://www.microeconomicsnotes.com
2. https://corporatefinanceinstitute.com
3. https://www.toppr.com

Teaching and learning methods
- o Chalk and Talk
- o Power point
- o Brainstorm
- o Quiz
- o ICT Tools
- o Case study

Course Outcome

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

SL.NO	COURSE OUTCOMES	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Understand the nuances of microeconomic ideas in the business	K2
CO2	Relate the economic concepts to arrive business decision	K3
CO3	Forecast the demand and profit with the help of economic theories	K5
CO4	Apply the break-even analysis in business practice	K4
CO5	Assess the business conditions through economic doctrines	K4

K1=Remembering, K2= Understanding, K3 = Application, K4= Analysis and K_5= 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	3	3	3	-	3	3	2	-	-	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
CO4	3	3	3	3	3	3	3	-	3	3	3	-	-	30
CO5	3	3	3	3	3	3	3	-	3	3	3	-	-	30
Grand total of COs with PSOs and POs														149
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{149}{50})$														2.98

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			2.98
Observation	COs of Managerial Economics in relation with PSOs and POs is Strong		

DEGREE	: B.A. Economics	**CLASS**	: II year
SEMESTER	: III	**HOURS**	: 60
SUBJECT CODE	: 22UECE13	**CREDITS**	: 03

CORE ELECTIVE (1 B): PRINCIPLES OF MANAGEMENT

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

Course Educational Objectives (CEO) :
1. To inculcate evolution of management concepts
2. To enlighten the implications of the planning of an organization
3. To impart the technique and structure of an organization
4. To familiarise the knowledge of Directing & Management culture
5. To educate the techniques of controlling mechanism

UNIT – I MANAGEMENT CONCEPTS AND PRINCIPLES **(12 Hours)**

Management: Meaning and Definition – Management Approaches – Characteristics of Management – Henry Fayol's Principles – Administration Vs Management – Management Functions – Manager – Role and Responsibilities

UNIT – II: PLANNING AND DECISION MAKING **(12 Hours)**

Planning: Meaning and Definition – Characteristics of Sound Plan –Steps in Planning Process – Methods of Planning – Planning Process – Limitations of Planning

Decision making: Definition– Characteristics of effective decision – Decision Making Process – Administrative Problems in Decision-making

UNIT – III: ORGANIZATION AND DELEGATION OF AUTHORITY **(12 Hours)**

Meaning and Definition – Organizational Structure – Nature and Importance – Functions of organization – Classification of Organization: Formal and Informal – Delegation of Authority – Importance – Elements – Departmentation – Meaning – Process – Types of Departmentation

UNIT – IV: STAFFING AND SUPERVISION **(12 Hours)**

Staffing: Definition – Elements – Functions and Process of Staffing – Recruitment and Selection – Career Strategy – Training and Development – Performance Appraisal

Directing: Nature – Elements – Supervision – Functions – Responsibilities – Communication – Importance – Types

UNIT – V: MOTIVATION and LEADERSHIP **(12 Hours)**

Motivation: Definition – Need for Motivation – Theories of Motivation – Maslow's Theory – Douglas McGregors Theory – Herzberg's Theory

Leadership: Definition – Functions – Qualities – Leadership Styles – Theories - Trait Theory – Behavioural Theory – Situational Theory

Books for Study:
1. Ramasamy. T, Principles of Management, Himalaya Publications, Bangalore, 2013
2. R.N. Gupta, Principles of Management, S. Chand & Company, New Delhi, 2014
3. Harold Koontz, Heinz Weihrich, Mark V. Cannice, Essentials of Management, McGraw Hill, 2020

Books for Reference:
1. Dick Carlson, Modern Management: Principles and Practices, Jai Co. Publishing, New Delhi, 1982
2. Rao V S P and Hari Krishna V, Management Texts and Cases, Excel Books, New Delhi, 2009

3. Chuck Williams & Manas Ranjan Tripathy, Principles of Management, Cengage Learning, New Delhi 2016

Websites for reference:
1. https://kanchiuniv.ac.in
2. https://www.tutorialspoint.com
3. https://2012books.lardbucket.org

Teaching and learning methods
- o Chalk and Talk
- o Power point
- o Case Study
- o Brainstorm
- o Quiz
- o ICT Tools

Course Outcome

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

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO_1	Comprehend the core concepts of management	K2
CO_2	Explain the needs of planning by enterprises	K2
CO_3	Assess the activities of an organization	K3
CO_4	Lead people towards the accomplishment of organizational goals	K3
CO_5	Indicate the controlling activities of management	K2

K1=Remembering, K2= Understanding, K3 = Application, K4= Analysis and K_5= 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	2	2	2	2	3	3	2	2	2	1	-	-	24
CO2	1	3	1	1	2	3	3	3	1	1	2	-	-	21
CO3	1	3	1	1	2	3	3	3	1	1	2	-	-	21
CO4	2	2	1	2	2	3	3	2	2	1	2	-	-	22
CO5	2	2	1	2	2	3	3	2	2	2	1	-	-	22
Grand total of COs with PSOs and POs														110
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{110}{55})$														

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			2.0
Observation	COs of Principles of Management in relation with PSOs and POs is Medium		

DEPARTMENT OF ECONOMICS

DEGREE	: B.SC.,	CLASS	: II year
SEMESTER	: III	HOURS	: 45
SUBJECT CODE	: 22UECN13	CREDITS	: 02

Non – Major Elective: Elements of Indian Economy

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

Course Educational Objectives (CEO):

- To familiarize with the concepts related to Indian Economy.
- To recall the demographic dividend in India.
- To summaries the concept of fiscal and monetary economics
- To know the importance of planning in an economy
- To list the various spheres of revolutions in India

UNITS – IINDIAN ECONOMY   (9 Hours)

Indian Economy: Meaning – Features of Indian Economy - National Income: Concepts –– Sectoral Components - Sectoral Contribution to National Income – Mixed Economy: Features – Economic reforms – Reasons – Components – Planning commission – NITI AAYOG: Function

UNIT –II DEMOGRAPHY   (9 Hours)

Demography: Meaning - Demographic Profile of India – Malthusian Theory of Population - Demographic Transition Theory - Population Policies in India – HDI and India: Meaning - Criteria – NLRM

UNIT – III MONEY AND BANKING   (9 Hours)

Money – Currency – Fiat – Legal Tender Plastic money – Digital Currency – RBI - Functions – Monetary Tools: Cash Reserve Ratio – Statutory Liquidity Ratio- Repo Rate – Reverse Repo Rate - Marginal Standing Facility - Open Market Operation - Measure of Money Supply in India – Share Market: Meaning – Speculators: Meaning - Bull, Bear, Stag and Duck -   Inflation : Meaning – Types – Core inflation – Headline inflation –Monetary Policy Committee – Structure and functions

UNIT – IV PUBLIC FINANCE   (9 Hours)

Budget: Meaning – Components – Deficit: Budget Deficit - Revenue Deficit – Fiscal Deficit – Primary Deficit – Effective Revenue Deficit – Monetized Fiscal Deficit – Taxes: Meaning - Types - Direct Taxes - Indirect taxes - VAT: Meaning – GST: Meaning – Structure of GST Council – Tax Slabs - Finance Commission – (Horizontal and Vertical devolutions) – Recent Finance Commission.

UNIT – V POVERTY AND UNEMPLOYMENT   (9 Hours)

Poverty: Meaning - Types – Poverty Measures in India – Labour Force participation – Work Force Participation in different sectors – Unemployment: Meaning – Types - Agrarian Revolutions in India – Social Welfare Schemes – MGNREGP - PoshanAbhiyaan -

Book for Study

1. V.K. Puri & S.K. Misra, Indian Economy, Himalaya Publishing House, Mumbai, 2018
2. K. Ray, The Indian Economy, Prentice Hall of India Pvt. Limited, New Delhi 2018
3. GauravDatt and Ashwani Mahajan, Datt & Sundharam's Indian Economy, S. Chand & Company, New Delhi, 2017

Books for Reference

1. Uma Kapila, Indian Economy Performance and Policies, Academic Foundation, New Delhi, 2019
2. K.R,Gupta and J R Gupta, Issues in Indian Economy, Atlantic publishers and Distributors, New Delhi, 2017

3. Ramesh Singh, Indian Economy, McGraw Hill, New Delhi, 2022
 Websites for reference:

1. https://www.investindia.gov.in

2. https://www.finmin.com

3. https://www.drishtiias.com

Teaching and learning methods:

- Lecture
- Reading the text
- Summaries each segment

Course Outcomes

After completion of course Elements of Indian Economy the student will be able to

SL.NO	COURSE OUTCOMES	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Comprehend the various concepts and definitions of National income and economic policies in India	**K2**
CO2	Understand the demographic profile and Human development index	**K2**
CO3	Indicate the different tools of monetary policy and distinguish among different types of inflation	**K2**
CO4	Assess the different types of fiscal deficits and recognize the various taxes	**K3**
CO5	Explain the various kinds of poverty and unemployment	**K3**

K$_1$= Knowledge, **K$_2$**= Understanding and **K$_3$**= Application

Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	*Level*	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	*Level*
CO1	2	2	2	-	2		2	2	1	2	2	2	1	1	21
CO2	2	3	-	-	1		2	2	3	2	2	2	1	1	21
CO3	3	3	2	-	1		2	2	2	2	2	2	1	1	23
CO4	2	1	-	-	1		2	2	2	2	1	1	1	1	16
CO5	2	2	-	-	1		2	2	-	-	2	2	1	1	15
Grand total of COs with PSOs and POs															96
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{96}{55})$															

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		1.74	
Observation	**COs of Elements of Indian Economy Strongly related with PSOs and POs**		

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

CLASS	: U.G. (Aided)	**PART**	: Self-Learning Course
SEMESTER	: III	**CREDIT** : 03	
SUBJECT CODE	: 22UECSL3		

ECONOMICS OF SOCIAL PROBLEMS IN INDIA

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

Course Educational Objectives (CEO):
- To disseminate the concept of Social problem.
- To summarise on poverty and population
- To understand child problems
- To recognize Illiteracy and Black money
- To discuss communalism and communal violence

UNIT - I: CONCEPTS AND APPROACHES
Concepts, Characteristics, Causes, Types, Stages in the Development of Social Problem, Social Problem and Social Change in India.

UNIT – II: POVERTY & POPULATION
Poverty: Concept, Measurement, Incidence and Magnitude, Causes, Problems of poor and pains of poverty, Measures for Poverty Alleviation.
Population: Increase in Population, Causes, Effects, Population Policy, Family Planning, Measures to Control Population.

UNIT – III: CHILD LABOUR, CHILD ABUSE AND GENDER ISSUES
Child Labour: Child Population and Working Children.
Child Abuse: Concepts, Types, Incidence, Theoretical Explanation, Victims, Causes, Effects, Problems of Child Labour.
Gender Issue: Women Harassment, Nature, Extent, Characteristics, Violence against Widows, Victims of Violence, Perpetrators of Violence, Motivation in Violence, Types of Violence.

UNIT – IV: ILLITERACY & BLACK MONEY
Education, Development, Magnitude of Illiteracy, National Policy on Education, Measures adopted for eradicating illiteracy, Efforts by Voluntary Organizations.
Black Money: Meaning, Magnitude, Causes, Effects, Measures to Control.

UNIT – V: COMMUNALISM AND COMMUNAL VIOLENCE
Communalism: Concept of Communalism, Communalism in India.
Communal Violence: Causes, Theories, Role of Police, Prescriptive Measures.

Books For Study:
1. Ahuja Ram. 1990, Social Problems in India, Rawat Publications, Jaipur.
2. Kuppuswamy. 1993, Social change in India, Konark Publications, New Delhi.
3. Agarwal .A.N. 2003, Indian Economy, New Age International Publishers, New Delhi.

Books for Reference:
1. Sharma Ramnath. 1997, Indian Social Problems, Oxford & IBH, New Delhi.
2. Chandran E. 1994, Social Problems of India, Cosmos Bookhire, New Delhi.

3. Misra&Puri. 2005. Indian Economy, Himalaya Publishing House, Mumbai.
 Websites for reference:
1. https://www.toppr.com
2. https://onlinecourses.swayam2.ac.in
3. https://ccsuniversity.ac.in

Teaching and learning methods:
- Lecture
- Reading the text
- PowerPoint presentation
- Quiz
- Journals and Magazines

Course Outcomes

   After completion of course Economics of social problems in India the student will be able to

SL.NO	COURSE OUTCOMES	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Identify the concept of social problem	K2
CO2	Explain Poverty and Population	K2
CO3	Understand child related problems	K2
CO4	Aware about illiteracy and black money	K3
CO5	Comprehend communalism and communal violence	K3

K_1= Knowledge, K_2= Understanding and K_3= Application

Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Level	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Level
CO1	3	1	-	2	2		3	3	2	3	1	-	-	-	20
CO2	3	1	-	2	2		3	3	2	3	1	-	-	-	20
CO3	3	1	-	2	2		3	3	2	3	1	-	-	-	20
CO4	3	1	-	2	2		3	3	2	3	1	-	-	-	20
CO5	3	2	-	2	2		3	3	2	3	1	-	-	-	21
Grand total of COs with PSOs and POs															101
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{101}{45})$															2.24

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 Economics of social problems in India Strongly related with PSOs and POs**		

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

DEGREE	: B.A. Economics	CLASS	: II year
SEMESTER	: IV	HOURS	: 75
SUBJECT CODE	: 22UECC64	CREDITS	: 05

CORE: BANKING

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

Course Educational objectives (CEO):
- To familiarize the basics of Indian Banking systems.
- To understand the functioning of banking systems.
- To highlight the role of banking institutions in the development of the economy.
- To know the operations of financial markets.
- To examine the working of monetary tools

UNIT – I BANKINGSYSTEM   *(15 Hours)*
Banking: Meaning – Functions of Banking System - Components of Banking System – Classification of Banks – Commercial Banks – Development Banks – Cooperative Banks – Role of Banks in Developing Economy

UNIT – II COMMERCIAL BANKING IN INDIA   (15 Hours)
Nationalization of Commercial Banks: Reasons – Achievements and Failures Commercial Bank – Deposit Insurance and Credit Guarantee Corporation – A Note on NBFI – Development Banks: Meaning – Features – Structure -– E-Banking: Meaning – Forms of e-banking - Models of e-banking - Benefits of e-banking - Risk Management for e-banking – Recent Banking Sector Reforms in India

UNIT – III CENTRAL BANK   (15 Hours)
Central Bank: Meaning - Necessity of Central Bank – Principles of Central Banking Functions of Central Bank – Role of Central Bank in Developing Countries

UNIT – IV CREDIT CONTROL   (15 Hours)
Credit Creation: Meaning - Technique – Credit Control: Meaning – Objectives of Credit Control - Methods of Credit Control: Quantitative Credit Control methods – Bank Rate or Discount Rate Policy – Open Market Operation – Variable Cash Reserve Ratio – Qualitative or Selective Credit Control Methods: Meaning – Objectives – Selective Credit control Methods – Types of Selective Credit Control Method

UNIT - V:FINANCIAL MARKET   (15 Hours)
Money Market: Meaning – Institutions of Money Market – Instruments of Money Market – Functions of Money Market – Capital Market: Meaning – Functions– Difference and interrelations between Money Market and Capital Market – Measures to Strengthen the Money and Capital Market – Speculators: Meaning - Kinds (Bull, Bear, Stag, Duck) – SEBI - Objectives

Books for Study:
1. Mithani D M, Money, Banking, International trade and Public Finance, Himalaya Publication house Mumbai, 2017
2. HajelaT.N. Money, Banking and International Trade, ANE Books Pvt. Ltd, New Delhi, 2016
3. Gurusamy S, Banking Theory Law and Practice, Vijay Nicole Imprints Private limited, Chennai - 2016

Books for Reference:
1. Seth M.L. Money, Banking, International Trade and Public Finance**,** Vrinda Publications P Lt, 2014
2. Maclod Henry Dunning, Elements of banking, Longmans, Green, & Co - London, UK, 2005
3. Ken Hoyle, Money and Banking Made Simple, et al, Rupa and Co, New Delhi, 2015

Websites for reference:
1. https://app1.unipune.ac.in
2. https://rbidocs.rbi.org.in
3. https://nios.ac.in

Teaching and learning methods:
- Lecture
- Reading the text
- Summaries each segment
- Class presentation

Course Outcome

After completion of course Bankingthe student will be able to

Sl.no	Course outcomes	Knowledge level (Bloom's taxonomy)
CO$_1$	Recognize the working and importance of commercial Banks	K$_3$
CO$_2$	Describe the functions of RBI and understand the role of monetary tools in Indian economy	K$_3$
CO$_3$	Trace the evolution of Commercial Banking system in India	K$_3$
CO$_4$	Assess the relevance of money and capital marketing in India and understand the movement of share market	K$_4$
CO$_5$	Guide the public in Traditional and e - Banking transactions	K$_5$

K$_1$= Knowledge, K$_2$= Understanding, K$_3$= Application, K$_4$= Analysis and K$_5$= Synthesis

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	2	1	2	2		3	2	-	1	2	1	1	19
CO2	3	3	2	1	1		3	2	-	1	1	1	1	19
CO3	2	2	1	2	1		2	2	-	2	1	1	1	17
CO4	3	3	2	1	2		3	3	1	3	2	2	2	27
CO5	3	3	2	-	2		3	3	2	2	1	1	1	23
Grand total of COs with PSOs and POs														105
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{105}{56})$														1.87

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		1.87	
Observation	**COs of Banking in relation with PSOs and POs is medium**		

DEPARTMENT OF ECONOMICS

Class	: II BA Economics	Class	: II year
Semester	: IV	Hours	: 75
Subject Code	: 22UECA44	Credit	: 04

Allied: ACCOUNTING FOR MANAGEMENT

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

Course **Educational** *Objectives (CEO)*
- To recall the basic principles of accounting
- To identify the different business transaction
- To analyse the financial statements
- To find the funds flow of the Company
- To calculate the cost of commodity

UNIT – I MANAGEMENT ACCOUNTING (15 Hours)

Management Accounting: Meaning - Objectives - Functions - Ratio Analysis - Meaning-Classification of Ratios – Liquidity Ratios and Profitability Ratios.

UNIT - II FINANCIAL STATEMENT (15 Hours)

Analysis of Financial Statements: Meaning –Objectives –Uses - Types - Common Size Statements Analysis - Comparative Statements Analysis -Trend Analysis.

UNIT-III FUNDFLOW ANALYSIS (15 Hours)

Meaning – Objectives – Advantages – Limitations – Statement of changes in working capital – Preparation of Fund Flow Statement.

UNIT - IV CASH FLOW ANALYSIS (15 Hours)

Definition –Sources and Applications – Objectives – Advantages –Limitations – Procedure of Preparing Cash Flow Statement.

UNIT – V COST SHEET (15 Hours)

Costing: Meaning – Objectives – Advantages – Differences between Cost& Financial Accounts – Classification of Costs –Preparation of Cost Sheet

Books for Study

1. Maheswari, S.N.,"Management Accounting", Sultan &sons, New Delhi, 2017
2. Jain S.P. and K.LNarang. " Cost Accounting" Kalyani Publications, New Delhi, 2017
3. Wilson. M., Management Accounting.Himalaya Publishing House. New Delhi., 2014

Books for Reference

1. Shukla. MC, T.S Grewal, , Cost Accounting"S.Chand&Company Ltd., New Delhi, 2010
2. Srinivasan&Ramachandran "Management Accounting," Sriram Publications, Tiruchy, 2010
3. RSNPillai,Bagavathi **"Management Accounting,"** S Chand ,New Delhi ,2010

Website for Reference

1.https://www.principlesofaccounting.com
2. https://www.investopedia.com
3. https://www.naukri.com

Teaching and Learning Methods:

- Lectures
- Summary of each section

- Class Presentation
- Work out

Course Outcomes

After completion of course Accountingfor Managementthe student will be able to

SL.NO	COURSE OUTCOMES	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO$_1$	Recognise the management accounting and Generate the financial figures	K$_3$
CO$_2$	Formulate fund management skill and Analyse different financial statements	K$_4$
CO$_3$	Identify the fund flow management	K$_4$
CO$_4$	Demonstrate the cash flow management of enterprises	K$_3$
CO$_5$	Find the total costs of commodity and the selling price	K$_3$

K$_1$= Knowledge, **K$_2$**= Understanding, **K$_3$**= Application, and **K$_4$**= Analysis

Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	*Level*	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	*Level*
CO1	2	3	2	-	3		2	2	-	1	1	2	1	1	20
CO2	1	3	2	-	3		2	2	-	1	1	3	2	2	22
CO3	3	2	2	-	2		2	2	-	2	1	3	2	2	23
CO4	2	3	2	-	3		2	2	-	1	1	2	2	2	22
CO5	3	2	2	-	3		2	2	-	2	2	2	2	2	24
Grand total of COs with PSOs and POs															111
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{111}{55})$															2.01

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			2.01
Observation	**COs of Accounting For Management Strongly related with PSOs and POs**		

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

DEGREE	: B.A. Economics	CLASS	: II year
SEMESTER	: IV	HOURS	: 60
SUBJECT CODE	: 22UECE24	CREDITS	: 03

Core Elective: QUANTITATIVE APTITIUDE

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

Course **Educational** *Objectives (CEO)*
- To recall the fundamental mathematical operation
- To solve the problems in shortest time
- To compare different methods to solve the problem
- To apply the mathematical problems in real life situation
- To forecast the outcome

Unit – I   **(12 Hours)**
Simplification – Problems on Numbers – Problems on Ages

Unit – II   **(12 Hours)**
Surds & Indices **–** Average **–** Percentage

Unit – III   **(12 Hours)**
Ratio & Proportion **–** Partnership **–** Profit & Loss

Unit – IV   **(12 Hours)**
Time & Distance **–** Time & Work - Area

Unit – V   **(12 Hours)**
Simple Interest **–** Compound Interest

Book for Study
1. Aggarwal R.S. Quantitative Aptitude for Competitive Examinations, Sultan Chand & Sons, New Delhi, 2013
2. Rajesh BalasubramanianQuantitative Aptitude for the CAT, **Access Publishing India Private Limited, New Delhi,** 2015
3. AbhijitGuha, Quantitative Aptitude for All Competitive Examinations, Tata McGraw Hill Education, New Delhi, 2016

Books for Reference
1. Khattar, Quant Aptitude for COMP Exams Pearson Education India, Chennai, Tamil Nadu, 2015
2. Arihant Experts, Chapterwise Solved Papers 2000-2015 Bank PO QUANTITATIVE APTITUDE, Arihant Publications, New Delhi, 2016
3. Quantitative Aptitude magazines (Various Issues)

Website for reference
1. http://www.prep4paper.com
2. https://www.javatpoint.com
3. https://www.geeksforgeeks.org

Teaching and Learning Methods:

- Lectures
- Home work
- Problem Solving
- Class Presentation
- Assignment

Course Outcomes

After completion of course Quantitative Aptitude the student will be able to

SL.NO	COURSE OUTCOMES	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO_1	Illustrate the simplification and average	K_3
CO_2	Analyze the profit and loss of the product	K_4
CO_3	Measuring the ratio and proportion of shares among the partners	K_1
CO_4	Differentiate from simple interest and compound interest	K_4
CO_5	Identify the volume & surface area	K_5

K_1= Knowledge, K_2= Understanding, K_3= Application, K_4= Analysis and K_5 = Synthesis

Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	*Level*	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	*Level*
CO1	3	3	2	-	3		3	3	-	2	3	3	3	2	30
CO2	3	1	2	-	3		3	3	-	1	2	2	2	2	24
CO3	3	1	3	-	3		3	3	-	2	3	3	3	2	29
CO4	2	2	-	-	3		3	3	1	2	3	3	2	2	26
CO5	2	-	-	-	3		2	2	-	2	2	3	2	2	20
Grand total of COs with PSOs and POs															129
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{129}{53})$															2.43

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 Quantitative AptitudeStrongly related with PSOs and POs**		

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

DEGREE	: B.A. Economics	CLASS	: II year
SEMESTER	: IV	HOURS	: 60
SUBJECT CODE	: 22UECE24	CREDITS	: 03

VERBAL AND NON-VERBAL REASONING

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

Course Educational Objectives (CEO) :
1. To grasp the concepts in classification and blood relations.
2. To understand mathematical operations and data sufficiency
3. To assess the assertion and reason
4. To inculcate methods to find out series and analogy
5. To outline figure matrix and analysis

VERBAL REASONING

UNIT – I VERBAL REASONING – I (12 Hours)
Analog – Classification - Series completion – Coding – Decoding – Blood relations – Puzzle test – Sequential output tracing – Direction sense test – Logical venn diagrams – Alphabet test – number, Ranging and Time sequence test.

UNIT – II VERBAL REASONING – II (12 Hours)
Mathematical operations – Logical sequence of words – Arithmetical reasoning – Inserting the missing character – Data sufficiency – Decision-making

UNIT – III VERBAL REASONING – III (12 Hours)
Assertion and reason – Situation reaction test **–** Verification of truth of the statement.
NON-VERBAL REASONING

UNIT – IV NON-VERBAL REASONING - I (12 Hours)
Series – Analogy – Classification – Analytical reasoning – Mirror images – Water images – Embedded figures – Completion of incomplete pattern

UNIT – V NON-VERBAL REASONING – II (12 Hours)
Figure matrix – Paper folding – Paper cutting – Rule detection – Grouping of identical figures – Cubes and dice – Dot situation – Construction of squares and triangles – Figure formation and analysis

Book for study:
1. R.S. Aggarwal, A Modern Approach to Verbal and Non-Verbal Reasoning, S. Chand And Company Limited, New Delhi, 2021.
2. Rajesh Kumar Thakur, A Latest Approach to Verbal & Non-Verbal Reasoning, PrabhatPrakashan, New Delhi, 2022.
3. Sijawli BS, A New approach to reasoning – Verbal, Nonverbal & Analytical., Arihant publications India limited, New Delhi, 2020.

Books for Reference:
1. PratiyogitaDarpan (Various issues), UpkarPrakashan, Uttar Pradesh.
2. Competition success review (Various issues), A CSR Publication, New Delhi.
3. Competition Refresher (Various issues), Bright Group Of Publications, New Delhi.

Website for reference:

1. https://www.indiabix.com
2. https://duhslibrary.ac.in
3. https://www.tutorialride.com

Teaching and learning methods

- o   Lecture
- o   Power point
- o   Brainstorm
- o   Quiz
- o   Videos

Course Outcome

After completion of course verbal and non-verbal reasoning the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO_1	Workout coding and decoding	K2
CO_2	Assess the Mathematical operations	K4
CO_3	Analyse assertion and reason	K3
CO_4	Compute analogy and series	K3
CO_5	Construct squares and triangles	K3

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K_5= Synthesis

Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Level	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Level
CO1	3	3	2	-	3		3	3	-	2	3	3	3	2	30
CO2	3	1	2	-	3		3	3	-	1	2	2	2	2	24
CO3	3	1	3	-	3		3	3	-	2	3	3	3	2	29
CO4	2	2	-	-	3		3	3	1	2	3	3	2	2	26
CO5	2	-	-	-	3		2	2	-	2	2	3	2	2	20
Grand total of COs with PSOs and POs															129
Mean Value of COs with PSO and POs $= \frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{129}{53})$															2.43

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 verbal and non-verbal reasoning Strongly related with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS) KARUMATHUR – 625514
DEPARTMENT OF ECONOMICS

Class	: II BA Economics	Class	: II year
Semester	: IV	Hours	: 45
Subject Code	: 22UECN24	Credit	: 02

Non Major Elective: **COMPARATIVE ECONOMIC SYSTEM**

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

Course **Educational** *Objectives (CEO)*

- To familiarise with different economic system
- To interpret the inherent problem in various economic system
- To compare different economic system
- To understand the economic system in India
- To analyze the convergence of economic system

UNIT – I MEANING, NATURE AND SCOPE OF ECONOMIC SYSTEMS   (9 HOURS)

Economic System: Meaning – Features - Importance of the study of Economic System

UNIT – II CAPITALISM   (9 HOURS)

Capitalism: Definition - Institutions of Capitalism - Evolution of Capitalism- Achievements of Capitalism - Shortcomings of Capitalism - Problem of inequality and under employment under Capitalism.

UNIT – III SOCIALISM AND COMMUNISM   (9 HOURS)

Socialism: Meaning – Definition - Characteristics of Socialism -Advantages of Socialism - Shortcomings of Socialism

Communism: Definition – Features – Advantages and Disadvantages – Communism Vs Socialism: Similarities – Differences

UNIT – IV MARXISM   (9 HOURS)

Marxian Economics: Main Elements of Marxism – Importance – Assessment of Marxian Theory of Economic Development.

UNIT – V INDIAN THINKING OF ECONOMIC SYSTEMS   (9 HOURS)

Mixed Economy: Meaning – Features – Merits – Demerits – Convergence of Economic System – Gandhian Economics: Salient Features – Merits – Demerits

Books for Study

1. Sen, K.K. Comparative Economic System, Sultan Chand & Sons, New Delhi, 2009
2. Israney, Text Book of Economic System, Himalaya Publishing House, Mumbai, 1976

Books for Reference

1. Rosser Barkley, Comparative Economics in a Transforming, Prentice Hall of India, New Delhi, 2003
2. Martin Schnitzer James W. Nordyke Comparative Economic Systems Hardcover, Sultan Chand & Sons, New Delhi, 1999

Website for references:

1. https://www.bu.edu
2. https://www.insightsonindia.com
3. https://nou.edu.ng

Teaching and Learning Methods:

- Lectures
- Reading the text
- ICT- Class Presentation

- Discussion
- Debate

Course Outcome

After completion of course Comparative Economic System the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO$_1$	Listing the features of economic system	K$_1$
CO$_2$	Analyze the Capitalism	K$_4$
CO$_3$	Differentiate Socialism from Communism and point out its similarities	K$_4$
CO$_4$	Argue the importance and need of Marxian economic system at present scenario	K$_3$
CO$_5$	Relate the convergence of Indian economic systems	K$_4$

K$_1$= Knowledge, K$_2$= Understanding, K$_3$= Application and K$_4$= Analysis

Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Level	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Level
CO1	1	-	-	1	-		2	2	1	-	-	-	1	1	9
CO2	1	1	-	2	1		2	2	2	2	1	1	1	1	17
CO3	2	3	-	3	1		2	2	2	2	1	1	1	-	20
CO4	2	2	-	2	1		2	2	2	2	1	1	-	1	18
CO5	1	3	-	2	1		2	2	1	1	2	1	1	1	18
Grand total of COs with PSOs and POs															82
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{82}{53})$															1.54

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		1.54	
Observation	**COs of Comparative Economic System in relation with PSOs and POs is medium**		

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

CLASS	: U.G. (Aided)	**PART**	: Self Learning Course
SEMESTER	: IV	**HOURS**	:
CODE	: 22UECSL4	**CREDIT**	: 03

LABOUR PROBLEMS AND SOCIAL WELFARE

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

Course Educational Objectives (CEO) :
1. To instruct the basics of Labour Economics
2. To educate about the implications of wages and employment
3. To highlight the Trade unions and Industrial relations
4. To educate on the labour welfare measures
5. To enlighten on International LabourOrganisation

UNIT - I: INTRODUCTION
Labour: Meaning, Importance, Nature and Scope of Labour Economics, Characteristics of Labour, Forms of Labour

UNIT- II: WAGES AND EMPLOYMENT
Wages: Types of Wage Payment, Wage Structure and Wage Differentials, Wage Structure in India.
Employment: Recruitment, Training and Development, Problems of Unemployment, Causes of Unemployment, Types of Unemployment.

UNIT – III: TRADE UNION AND INDUSTRIAL RELATIONS
Trade Union: Origin and Growth, Functions, Features of a Good Trade Union, Hurdles for Trade Union Development, Role of Trade Unions in the context of Globalization. Industrial   Relations: Conflicts, Disputes, Ways of Settling Industrial Disputes, Workers Participation in Management.

UNIT - IV: LABOUR WELFARE
Labour Welfare: Various Schemes in India, Performance.

UNIT - V: ILO
ILO: Functions, Achievements.

Books for study:
1. Desai &Rao. 1986, Labour Problems and Social Welfare, RB publications, New Delhi.
2. AgarwalShoba. 1993, Labour Problems and Social Welfare, RatanPrakashan, Agra.

Books for Reference
1. Ramaswamy, E.A., &Ramaswamy Uma. 1985, Industry and Labour, An introduction Oxford & IBH,New Delhi.
2. Saxena, K. 1986, Labour Economics & Social Welfare, Nath& Co, Meerut.

Website for references:
1. https://labour.gov.in
2. http://oer.funai.edu.ng
3. https://monad.edu.in/img

Teaching and learning methods
- o Lecture
- o Power point
- o Brainstorm
- o Quiz
- o Journals
- o Reports

Course Outcome

After completion of course Labour Problems and Social Welfare the student will be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO$_1$	Expound the introduction of Labour Economics	K3
CO$_2$	Outline the wages and employment	K2
CO$_3$	Identify Trade union and Industrial relations	K2
CO$_4$	Narrate various Labour welfare measures	K3
CO$_5$	Explain the functions of ILO	K2

K1= Remembering, K2= Understanding and K3 = Application

Mapping of CO with PO and PSO

Out comes	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Level	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Level
CO1	3	1	-	2	2		3	3	2	3	1	-	-	-	20
CO2	3	1	-	2	2		3	3	2	3	1	-	-	-	20
CO3	3	1	-	2	2		3	3	2	3	1	-	-	-	20
CO4	3	1	-	2	2		3	3	2	3	1	-	-	-	20
CO5	3	2	-	2	2		3	3	2	3	1	-	-	-	21
Grand total of COs with PSOs and POs															101
Mean Value of COs with PSO and POs = $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = (\frac{101}{45})$															2.24

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 Labour Problems and Social Welfare 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	Subject Code	Paper	Hrs	Cr
		I Semester		
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil/ Hindi/French	06	4
II	22UENA11/ 22UENB11	English	05	4
III	22UPHC11	Core – 1: Introduction to Philosophy and Traditional Logic	06	5
	22UPHC21	Core – 2: Ancient Indian Thought	06	5
	22UPHA11	Allied – 1: General Psychology	05	4
IV	22UFCE11	FC: Personality Development	01	1
	22UBRC11	Bridge Course	-	1
	22UPHH12	Language Skills: Sanskrit	01	
V	22UNCC/NSS/ PED/YRC/ ROT/ACF/ NCB12	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
			30	**24**
		II Semester		
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil /Hindi/French	06	4
II	22UENA22/ 22UENB22	English	05	4
III	22UPHC32	Core – 3: Western Philosophy: Ancient and Medieval	06	5
	22UPHC42	Core – 4: Indian Philosophical Systems	06	4
	22UPHA22	Allied – 2: Ethics and its Social Dimensions	05	4
IV	22UFCH22	FC: Social Responsibility for Global Citizenship	01	1
	22UPHH12	Language Skills: Sanskrit	01	1
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB12	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
			30	**24**
		III Semester		
I	22UTAL33/ 22UHNL33/ 22UFNL33	Tamil /Hindi /French	06	4
II	22UENA33/	English	06	4

	22UENB33			
III	22UPHC53	Core – 5: Western Philosophy: Modern	05	4
	22UPHA33	Allied – 3: Social and Political Philosophy	05	4
	22UPHE13	Core Elective – 1a: Research Methodology Core Elective – 1b: Introduction to Islamic Philosophy	04	3
IV	22UPHN13	Basic Tamil/Advanced Tamil/Non-major Elective – 1 Professional Ethics (Science)	03	2
	22UFCE33	FC: Environmental Studies	01	01
V	22UNCC/NSS/ PED/YRC/ ROT/ACF/ NCB24	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	-
	22UARE14	ARISE	-	-
			30	**22**
		IV Semester		
I	22UTAL44/ 22UHNL44/ 22UFNL44	Tamil /Hindi /French	06	4
II	22UENA44/ 22UENB44	English	06	4
III	22UPHC64	Core – 6: Western Philosophy: Contemporary	05	5
	22UPHA44	Allied – 4: Philosophical Foundations of Human Rights	05	4
	22UPHE24	Core Elective – 2a: Eco-Philosophy Core Elective – 2b: Philosophy of Knowledge: Classical Approach	04	3
IV	22UPHN24	Basic Tamil/Advanced Tamil/Non-Major Elective –2: Philosophy for Competitive Examinations (Arts)	03	2
	22UFCG44	FC: Faith and Reason	01	1
V	22UNCC/NSS/ PED/YRC/ROT/ ACF/NCB24	Extension Activities NSS / NCC / Phy.Edn. / YRC / ROTARACT / AICUF / Nature Club	-	1
	22UARE14	ARISE	-	1
			30	**25**
		V Semester		
III	22UPHC75	Core – 7: Philosophy of Knowledge: Contemporary Approach	05	5
	22UPHC85	Core – 8: General Metaphysics	05	4
	22UPHC95	Core – 9: Philosophy of God and Religion	05	4
	22UPHD05	Core – 10: Moral Philosophy	05	4
	22UPHD15	Core: 11: Postmodern Philosophy	05	4

IV	22UPHI15	Skill Based Elective – 1a: Applied Psychology	03	2
	22USBY15	Skill Based Elective – 1b: Internet and Office Automation		
	22USSI16	Soft Skills	02	
	22UINT15	Project	0	1
			30	**24**
VI Semester				
III	22UINT15	Core – 12: Modern and Contemporary Indian Thought	05	5
	22UPHD36	Core – 13: Philosophical Anthropology	05	4
	22UPHD46	Core – 14: Metaphysics: Contemporary Issues	05	4
	22UPHD56	Core – 15: Philosophy of Science	05	4
	22UPHD66	Core – 16: Comprehensive Understanding of Philosophy	05	4
IV	22UPHI26	Skill Based Elective – 2a: Applied Aesthetics	03	2
	22USBY26	Skill Based Elective – 2b: Web Design		
	22USSI16	Soft Skills	02	2
			30	**25**

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

Self-Learning Courses – Additional Credits

Semester	Credits
III	3
IV	3
V	3
VI	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

Class : B.A. Philosophy	**Part** : III Core-5
Semester : III	**Hours** : 75
Course Code : 22UPHC53	**Credit** : 04

WESTERN PHILOSOPHY: MODERN
(For those who joined in June 2022 onwards)

Course Objectives:

     This course helps the students to compare Medieval Philosophy with Modern Philosophy that they could analyze historical influence on Philosophy. The students will be guided to have an understanding of the contributions of different schools of Thought to the growth of the history of philosophy and to develop the ability to explore new avenues of reflection on reality in such a manner to appreciate the primacy of human in transforming the world.

Course Content:

Unit 1: The Emergence of Modern Period   **15 hours**

    (a) From Medieval to Modern – Characteristics of modern philosophy; **(b)** Renaissance – Humanism: Erasmus; **(c)** New science: Copernicus, Galileo, and Newton; **(d)** Political reformation: Machiavelli; **(e)** Religious reformation: Luther; **(f)** Rationalism and Empiricism: Definition and Comparison

Unit 2: Rationalism   **15 hours**

    (a) Descartes: Problem and Aim – Cartesian method – *Cogito ergo Sum* – Proofs for God's existence – Existence of things – Mind and Body as two Substances – Problem of Dualism – Interactionism; **(b) Spinoza:** Aim - Substance: Modes and attributes – Pantheism – Parallelism – Levels of knowledge – Mind and Body – Ethics; **(c) Leibniz:** Aim – Attempt of Reconciliation between traditional theistic philosophers and modern mechanists – Doctrine of monads – Pre-Established Harmony – Principle of Sufficient Reason – Evil and the Best World

Unit 3: Empiricism   **15 hours**

    (a) Locke: Refutation of innate ideas – Nature and validity of knowledge: Simple and Complex ideas, Primary and Secondary qualities – Substance – Degrees of Knowledge; **(b) Berkeley:** Aim – *Esse est Percipi* – Subjective idealism – Solipsism – Science and Abstract ideas – Substance; **(c) Hume:** Origin and validity of knowledge – Causal relation – External things – Denial of self – Skepticism

Unit 4: Synthesis of Rationalism and Empiricism   **15 hours**

    Kant: Aim – Reconciling Rationalism and Empiricism – Nature of *apriori* knowledge: Is synthetic *apriori* judgement possible? – Possibility of Metaphysics – Categories of Thought – Postulates of Practical reason: Categorical and Hypothetical imperatives – Transcendental Idealism

Unit 5: Beyond Rationalism and Empiricism   **15 hours**

    (a) Hegel: The Absolute – The Dialectical Method: Triadic Logic – The Objective Embodiment of Spirit – Impact of Hegel on Western Philosophy; **(b) Nietzsche:**

Discontent with modernism – Concept of history – Challenges to Christian God and Morality– Slave morality – Master morality – Superman

Books for Study:
1. Kenny, A. (2008). *The rise of modern philosophy* (Vol. 3). Oxford University Press.
2. Masih, Y. (1994). *A critical history of western philosophy*. Motilal Banarsidass.
3. Russel, B. (2016). *History of western philosophy*. Routledge Classics.
4. Stumpf, S. E. (1995). *Philosophy: History and problems*. McGraw Hill.
5. Thilly, F. (1993). *A history of philosophy*. Central Book Depot.

Books for Reference:
1. Copleston, F. (2003). *A history of philosophy* (Vols. 4-7). Image Books.
2. Castell and Borchert (1976). *An introduction to modern philosophy*. Macmillan.

Teaching and Learning Methods:
- Lectures and dialogues, ICT, Essays (Persuasive / Expository), Reflective Group discussion, Peer partner learning, Reading and Summarizing, Assignment Work, Class Presentation

Course Outcomes (COs):

CO No.	At the end of the course, students will be able to	Knowledge Level up to
CO1	**Identify** the orientation of divisions of philosophy in the Western domain	**K2**
CO2	**Evaluate** Rationalism as a Philosophical branch	**K5**
CO3	**Evaluate** Empiricism as a Philosophical branch	**K5**
CO4	**Assess** the philosophical attempts of explaining complex context of living	**K5**
CO5	**Relate** and **evaluate** the human potentiality in the formation of the world anew	**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	1	2	2	-	3	3	2	2	2	26
CO2	3	2	-	3	2	3	-	-	2	3	3	3	2	26
CO3	3	2	-	3	2	2	-	-	2	3	3	3	2	25
CO4	3	2	-	3	3	2	2	-	2	3	3	3	2	28
CO5	3	2	-	3	3	2	2	-	3	3	3	3	2	29
Grand Total of Cos with POs & PSOs														121
Mean value of COs With PSOs & POs = 134/53														2.53

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

NEW INTRODUCTION

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

Class	: B.A. Philosophy	**Part**	: III Core Ele. – 1
Semester	: III	**Hours**	: 60
Course Code	: 22UPHE13 (B)	**Credit**	: 03

INTRODUCTION TO ISLAMIC PHILOSOPHY
(For those who joined in June 2022 onwards)

Course Objectives:

The course enables the students to appreciate religious, social, political, economic and philosophic aspects of Islam, and helps the students to interpret them from different philosophical and ideological trends.

Unit I: Basic Conception of Human Life   **12 hours**

(a) Religious trends in Arabia before Islam; **(b)** Biography of the Prophet; **(c)** Original Teachings of Islam; **(d)** Conception of Life; **(e)** Faith and Belief; **(f)** Devotional Life and Religious Practices; **(g)** Cultivation of Spiritual Life

Unit II: Social Conception of Life   **12 hours**

(a) The System of Morality; **(b)** The Political System; **(c)** The Judicial System; **(d)** The Economic System; **(e)** The Status of Muslim Woman; **(f)** The Status of non-Muslims in Islam

Unit III: Philosophical Conceptions   **12 hours**

(a) Question of Existence and Quiddity and Ontology; **(b)** Post-Avicennian Philosophy and the Study of Being; **(c)** Epistemological Questions: Relations among Intellect, Reason, and Intuition within Diverse Intellectual Perspectives

Unit IV: Modernist and Contemporary Trends   **12 hours**

(a) Emergence of the Modernist Spirit: J. D. Al-Afghani and Muhammad 'Abdu; **(b)** Modernism in India: Sayyid Ahmad Khan, Ameer Ali, and Muhammad Iqbal; **(c)** Contemporary Trends: Liberalism, Secularism, and Fundamentalism – Existentialism, Positivism, and Marxism – Postmodernism and Hermeneutics

Unit V: Rise and Development of Islamic Mysticism (Sufism)   **12 hours**

(a) Ascetic Origins; **(b)** Pantheistic Tendencies: Al-Bastami (or Al-Bistami), Al-l:lallaj, and Others; **(c)** Synthesis and Systematization: Al-Ghazali and Ibn 'Arabi; **(d)** Romi, Supreme Mystical Poet; **(e)** Sufi Orders: Sufism Today

Books for Study:

1. Fakhry, M. (2004). *A history of Islamic philosophy* (3rd ed.). Columbia University Press.
2. Hamidullah, M. (1992). *Introduction to Islam*. Sh. Muhammad Ashraf Publishers.
3. Nasr, S. H. (2006). *Islamic philosophy from its origin to the present: Philosophy in the land of prophecy*. State University of New York Press.

Books for Reference:

1. Khan, M. W. (2016). *Introducing Islam: A simple introduction to Islam*. Goodword.
2. Nasr, S.H., & Leaman, O. (Ed.) (2001). *History of Islamic philosophy*. Routledge.
3. Sheikh, M. S. (1982). *Islamic philosophy*. The Octagon Press.
4. Taylor, J. B. (1987). Thinking about Islam (Rev. ed.) Lutterworth Press.

Teaching and Learning Methods:

- Lectures, ICT, Assignment, Group Discussion, Video Presentation

Course Outcomes (COs)

CO No.	*At the end of the course, students will be able to*	Knowledge Level up to
CO1	Explain the original teachings of Islam	K5
CO2	Perceive the significance of Islamic values in the public sphere	K5
CO3	Appreciate Medieval Islamic philosophies	K5
CO4	Approach Islamic teachings from contemporary philosophical trends	K5
CO5	Appreciate the mystical aspect of Islam	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	1	1	-	-	1	3	3	2	3	2	24
CO2	3	3	2	3	1	-	-	1	3	3	2	3	2	26
CO3	3	3	2	2	1	-	-	1	3	3	2	3	2	25
CO4	3	3	2	2	1	-	-	1	3	3	2	3	2	25
CO5	3	3	2	2	1	-	-	1	3	3	2	3	2	25
Grand Total of Cos with POs & PSOs														125
Mean value of COs With PSOs & POs = 125/55														2.27

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

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

Class : II B.A. Philosophy	**Part** : Core Ele. – 2
Semester : IV	**Hours** : 60
Course Code : 22UPHE24 (A)	**Credits** : 03

Eco-Philosophy

(For those who joined in June 2022 onwards)

Course Objectives:

The course aims at clarifying God's creation and man's responsibility towards it. It forms the environmental ethics and its methods as its basis, and values nature and its moral considerability. It also considers various types of normative theories and their implications towards nature. The study includes the holistic environmental ethics of Eco-centrism and Deep Ecology, and focuses on the relation between social justice and the environment.

Course Content:

Unit 1: Environmental Ethics and Its Methods   12 hours

(a) Environmental Issues – Purpose of Environmental Ethics, Three Bases, and Its Radicalness; **(b)** Methods of Environmental Ethics – Environmental Ethics and Environmental Science – Philosophical Method and Evaluating Arguments – Skepticism and Ethics – God and Ethics

Unit 2: Nature and Moral Considerability   12 hours

(a) Nature – Normativity of Nature – Evolution and Prescription; **(b)** Value of Nature and Naturalness; **(c)** Anthropocentrism – Ratiocentrism – Indirect Duties; **(d)** Efficiency – Sustainability – Future Generations; **(e)** Moral Considerability of Plants and Animals

Unit 3: Normative Theories   12 hours

(a) Consequentialist Environmental Ethics: Respect for Nature – Animal Rights – Environmental Rights; **(b)** Character Ethics: Environmental Virtue and Vices – Character and Environment Ethics – Environmental Virtue Ethics – Evaluating Ethical Theories

Unit 4: Holistic Environmental Ethics   12 hours

(a) Ecocentrism: Land Ethic – Ecocentrism – Ecosystems and Ecological Integrity; **(b)** Deep Ecology: Metaphysical Holism and Self Realization – Deep Ecology – Spiritual Experience; **(c)** Species and Biodiversity, Its Instrumental and Final Values – Duty to Preserve Species – Climate Change and Conservation – Novel Species Conservation Strategies – Intervention or Restraint; (**d**) Cosmotheandric Experience

Unit 5: Social Justice and the Environment   **12 hours**

(a) Ecofeminism – Environmental Pragmatism – Practical Efficacy; **(b)** Environmental Justice: Unequal Exposure and Environmental Injustice – Environmental Justice and Cost-Benefit Analysis – Ethical Dimensions of Consumption; **(c)** Global Justice: Extent and Sources of Malnutrition – Life Boat Ethic – Feeding People and Saving Nature – Obligation to Assist

Books for Study:

1. Sandler, R. L. (2018). *Environmental ethics: Theory in practice*. Oxford University Press.
2. Thottakara, A. (Ed.). (2000). *Eco-dynamics of religion: Thoughts for the third millennium*. Journal of Dharma & Dharmaram Publications.

Books for Reference:

1. Desjardins, J. R. (2013). *Environmental ethics: An introduction to environmental philosophy* (5th ed.). Wadsworth.
2. Hessel, D. T., & Ruether, R. R. (Eds.). (2000). *Christianity and ecology: Seeking the well-being of earth and humans*. Centre for the Study of World Religions.
3. James, S. P. (2015). *Environmental philosophy: An introduction*. Polity Press.
4. Pannikar, R. (1993). *The cosmotheandric experience: Emerging religious consciousness* (Rev. ed.). Orbis Books.

Teaching and Learning Methods:

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

Course Outcomes (COs):

CO No.	*At the end of the course, students will be able to*	Knowledge Level up to
CO1	Explain environmental ethics and its methods	K5
CO2	Perceive nature and its moral considerability	K5
CO3	Evaluate normative theories of environmental ethics	K5
CO4	Interpret holistic environmental ethics	K5
CO5	Determine and relate social justice with the environment	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	2	3	1	-	-	3	2	3	3	3	27
CO2	3	3	3	3	3	1	1	1	3	3	3	3	3	33
CO3	3	3	3	3	3	1	1	1	3	3	3	3	3	33
CO4	3	3	3	3	3	1	2	2	3	3	3	3	3	35
CO5	3	3	3	3	3	1	1	1	3	3	3	3	3	33
Grand Total of Cos with POs & PSOs														161
Mean value of COs With PSOs & POs = 161/63														2.56

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

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

Class   : II B.A. Philosophy   Part   : Core Ele. – 2
Semester   : IV   Hours : 75
Course Code : 22PPHE24 (B)   Credits : 04

PHILOSOPHY OF KNOWLEDGE: CLASSICAL APPROACH
(For those who joined in June 2022 onwards)

Course Objectives:

The course helps the students to know the possibility and the sources of knowledge, and aims at right orientation towards competing theories of knowledge and their problems. It also familiarizes with the accounts of truth and error, and the justification and certainty of knowledge.

Unit 1:   Nature and Possibility of Knowledge   15 hours
(a) Nature and scope of Epistemology; (b) Knowledge and Its Types – Knowledge as Justified True Belief; (c) Ancient Skepticism: Ancient School of Skepticism – Academics and Pyrrhonians; (d) Modern Skepticism; (e) Indian Skepticism

Unit 2:   Sources of Knowledge   15 hours
(a) Perception: Problem of Perception – Rationalistic View – Sense Organs; (b) Inference: Objections against Inference and Responses; (c) Testimony: Kinds of Testimony – Testimony and Reliability; (d) Comparison and Analogy; (e) Postulate and Hypothesis; (f) Non-cognition

Unit 3:   Theories and Problems of Knowledge   15 hours
(a) Subjectivism; (b) Idealism: Kinds of Idealism – Idealism vs. Materialism; (c) Realism: Kinds of Realism – Mixed Realism and Idealism; (d) Critical Theory; (e) Dualism; (f) Intuitionism; (g) Nominalism; (h) Conceptualism; (i) Phenomenalism

Unit 4:   Theories of Truth and Error   15 hours
(a) Western Theories of Truth: Correspondence theory and Criticism – Coherence theory and Criticism – Pragmatic theory and Criticism – Reviewing the Correspondence View – Parameters of Truth; (b) Indian Theories of Truth – Svatahpramanya – Paratahpramanya; (c) Indian Theories of Error: Asatkhyati – Anyathakhyati – Anirvacaniyakhyati – Satkhyati

Unit 5: Justification and Certainty   15 hours
(a) Structure of Justification: Foundationalism; (b) Defining Certainty: Certainty Distinguished From Other States of the Mind; (c) Kinds of Certitude: Logical – Ontological – Physical – Moral – Religious – Some Problems; (d) Knowledge and Society

Books for Study:

1. Bernecker, Sven, Duncan Pritchard, ed., *The Routledge Companion to Epistemology*, Routledge, New York, 2011
2. Dancy, Jonathan, Ernest Sosa, and Matthias Steup, ed., *A Companion to Epistemology*, Wiley-Blackwell, Malden, MA., 2010
3. Datta, D.M., *Six Ways of Knowing*, Motilal Banarsidass, New Delhi, 2017
4. Fumerton, R., *Epistemology*, Blackwell, Oxford, 2006
5. Hospers, John, *Introduction to Philosophical Analysis*, Routledge, New York, 1997
6. Martin, R.M., *Epistemology: A Beginner's Guide*, Oneworld, London, 2010
7. Pritchard, D.H., *Epistemology*, Palgrave Macmillan, London, 2016
8. Sharma, Chandradhar, *Critical Survey of Indian Philosophy*, Motilal Banarsidass, New Delhi, 2016

Books for Reference:

1. Audi, R., *Epistemology: A Contemporary Introduction to the Theory of Knowledge*, Routledge, London, 2010
2. Das Gupta, S.N., *History of Indian Philosophy*, 5 Vols., Motilal Banarsidas, Delhi,1988
3. Ewing, A.C., *Fundamental Questions of Philosophy,* Chennai, Allied Publishers, 2012
4. Russell, B., *Human Knowledge, its Scope and Limits*, OUP, Oxford, 1990

Teaching and Learning Methods:

- Lecture, Video presentation, Book review, Classroom Presentation, Group discussion, Assignments

Course Outcomes (COs):

CO No.	At the end of the course, students will be able to	Knowledge Level up to
CO1	Examine the merits of philosophy of classical knowledge	K5
CO2	Evaluate the classical perspective of western philosophy of knowledge and critically analyze them.	K5
CO3	Assess and appraise the classical philosophical epistemology and compare them with the modern and contemporary perspective of knowledge.	K5
CO4	Examine the strategies ancient western philosophers have used to focus their specific approaches in epistemology.	K5
CO5	Become equipped to survey and evaluate the value of each philosopher of knowledge to differentiate and to appreciate the methodologies each philosopher has taken up.	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	2	-	2	2	3	3	2	2	3	29
CO2	3	3	2	2	2	-	2	2	3	3	2	2	3	29
CO3	3	3	2	2	2	-	2	2	3	3	2	2	3	29
CO4	3	3	2	3	2	-	2	2	3	3	2	2	3	30
CO5	3	3	2	3	2	-	2	2	3	3	2	2	3	30
Grand Total of Cos with POs & PSOs														147
Mean value of COs With PSOs & POs = 147/60														2.45

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

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

Class	: B.A. Philosophy	Part	: NME-Arts
Semester	: IV	Hours	: 45
Course Code	: 22UPHN24	Credit	: 02

PHILOSOPHY FOR COMPETITIVE EXAMINATIONS
(For those who joined in June 2022 onwards)

Course Objectives:

The paper is a philosophical approach to master the art and technique of various reasoning skills. The students could make use of them in their day today lifeworld situations at the same time it would be particularly useful in the job oriented competitive examinations conducted world-wide.

Unit 1: Introduction to Philosophy 9 hours

Meaning and Definition – Brief introduction to Greek Philosophy – Characteristics of Indian Philosophy – Orthodox and Heterodox – Law of Karma – Immortality of Soul – Polytheism – Monotheism – Henotheism – Monism

Unit 2: Essence of Indian Philosophy 9 hours

Vedas – Meaning – Parts of Vedas – Mantras, Brahmanas, Aranyakas and Upanishads – Upanishads – meaning – Concept of Brahman, Atman and World - Identity of Atman and Brahman – Bhagavat Gita: Meaning – Nishkama Karma, Karma Yoga, concept of God – Essence of Bhagavat Gita

Unit 3: Basics of Western Logic 9 hours

Definitions of Logic – Usefulness of the study of logic – Types of Reasoning – Difference between Deductive and Inductive Reasoning - Difference between Sentence and Proposition – Logic Propositions – Categorical Syllogism – Rules and Fallacies

Unit 4: Logical Reasoning 9 hours

Inserting missing character Test – Series completion Test – Alphabet series Test – Letter series Test – Number series Test – Coding and decoding Test – mixed letter coding Test – Mixed number coding Test

Unit 5: Analytical Reasoning 9 hours

Analogy test – Simple Analogy Test – Double Analogy Test – Blood Relationship Test – Logical deduction Test – Number test – Ranking Test – Time sequence test

Books for Study

1. Barker, S. F. (2002). *The elements of logic.* McGraw-Hill.
2. Bhardwaj, P. *The hand on guide to analytical reasoning and logical reasoning***.** Arihant Publications (India) Ltd. ISBN: 978-93-5203-854-1.

3. Chatterjee, S., & Datta, D. (2007). *An introduction to Indian Philosophy*. Rupa Publications.
4. Cohen, M. R., & Nagel, E. (2002). *An Introduction to logic and scientific method.* Simon Publications.
5. Copi, I. M., Cohen, C., & Mcmahon, K. (2016). *Introduction to logic* (14th ed.). Pearson.

Books for Reference

1. Grayling, A. C. (2001). *An introduction to philosophical logic.* Blackwell Publications.
2. Jain, T. S., & Lal. (1980). *A practical book of reasoning tests.* Upkar Prakashan Printing Unit.
3. Lourdunathan, S. (2017). *Invitation to logic.* Lordine Nuovo Publication.

Teaching and Learning Methods

- Lecture, ICT, Classroom Presentation, Assignment, Quizzes, and Group discussion

Course Outcomes (COs)

CO No.	*At the end of the course, students will be able to*	Knowledge Level up to
CO1	Understand the philosophy of life and its challenges	**K2**
CO2	Comprehend the different kinds of inference and apply their techniques in different situations	**K3**
CO3	Apply mathematical reasoning in finding solutions to mathematical problems	**K3**
CO4	Employ analytical reasoning in given situations	**K3**
CO5	Relate deductive reasoning in solving conceptional problems	**K3**

K1 = Remember, K2 = Understand, K3 = Apply, K4 = Analyze, 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	-	-	3	-	-	3	3	2	1	-	16
CO2	3	2	2	-	-	3	-	-	3	2	2	1	-	18
CO3	3	2	1	-	-	3	-	-	3	3	2	2	-	19
CO4	3	2	1	-	-	3	-	-	3	3	2	2	-	19
CO5	3	2	1	-	-	3	3	-	3	3	2	2	-	22
Grand Total of Cos with POs & PSOs														97
Mean value of COs With PSOs & POs = 97/41														2.37

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

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

Class : I B.A. Philosophy	Part : Allied - 2
Semester : II	Hours : 75
Course Code : 22UPHA22	Credits : 04

ETHICS AND ITS SOCIAL DIMENSIONS
(For those who joined in June 2022 onwards)

Course Objectives:

The course on Ethics and its Social Dimensions introduces the basic notions of ethics and social ethics. It addresses the axiological dimensions of current social developments in selected areas of economy, governance and science and technology.

Course Content:

Unit 1. Basic Notions of Ethics   **15 Hours**

Definition – Nature and Scope of Ethics; Social Ethics: Definition – Characteristics – Evolution and Implications of Social Ethics; Dharma and Common Good

Unit 2. Development Ethics   **15 Hours**

Human Development – Implied Values of Human Development: Expansion of Human Capabilities – Enhancement of Freedom – Fulfilment of Human Rights; Inclusive Development – Sustainable Development Goals – The Encyclical Laudato si' for the Care of the Common Home

Unit 3. Ethics in Governance   **15 Hours**

Principles of Good Governance: Transparency – Accountability – Fairness and Equity; Ethical Perspectives of Electoral Political Process – Code of Ethics for Public Servants – Corporate Governance – Corporate Social Responsibility

Unit 4. Medical Ethics   **15 Hours**

Basic Principles of Medical Ethics – Ethical Standards on Assisted Reproductive Technology – Abortion – Organ Transplantation – Euthanasia and Medically Assisted Death – Health Policy Ethics

Unit 5. Media Ethics   **15 Hours**

Ethical Principles and Standards of Media – Ethics of Journalism – Digital Media Ethics- Media Marketing Ethics – Media and Democracy

Books for Study:

1. Arora, K. R. (2008). *Ethics in governance*. Aalekh Publishers.
2. Das, A. (2015). *Media law and ethics*. Astha Publishers.
3. Dunn, H. P. (1994). *Ethics for doctors, nurses and patients*. St. Pauls.

4. Gilman, C. P. (2004). *Social ethics: Sociology and the future of society*. Praeger.
5. Singer, P. (2000). *Practical ethics*. Replica Press.

Web Links for Study:
1. Home – United Nations Sustainable Development.
   https://www.un.org/sustainabledevelopment/
2. The Encyclical – *Laudato si'*.
   https://www.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html

Books for Reference:
1. Longenecker, N. R. (1984). *New Testament social ethics for today*. Eerdmans.
2. Norman, R. (1998). *The moral philosophy*. OUP.
3. Titus, H. (1966). *Ethics for today*. Eurasia Publishing House.

Teaching and Learning Methods:

Lecturing, ICT, Film Analysis, Writing assignment / article, Class presentation, Group discussion

Course Outcomes (COs):

CO No.	At the end of the course, students will be able to	Knowledge Level up to
CO1	Understand the fundamental concepts of ethics and social ethics	**K2**
CO2	Promote the parameters of inclusive and sustainable development	**K5**
CO3	Uphold integrity in the public and corporate governance and life	**K5**
CO4	Develop value oriented and life generating approach to the use of medical science and technology	**K5**
CO5	Discern the right use of media facilities	**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	-	1	3	2	1	2	2	20
CO2	3	3	3	3	2	2	2	1	3	3	2	3	2	17
CO3	3	3	3	3	2	2	2	1	3	3	2	3	1	28
CO4	3	3	2	3	2	1	1	1	3	3	2	3	2	23
CO5	3	3	2	3	2	1	1	2	3	3	2	3	2	32
Grand Total of Cos with POs & PSOs														146
Mean value of COs With PSOs & POs = 146/64														2.28

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

PSOs - Programme Specific Outcome

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

PSO1: Develop an in-depth comprehension and appreciation of important concepts and trends in the field of philosophy, religion, and psychology.

PSO2: Articulate philosophical ideas and defend them effectively in argument, and critically respond to philosophy and other disciplines.

PSO3: Instil in oneself and in others the qualities of right thinking, value based living, and peaceful coexistence with other persons and with nature.

PSO4: Employ philosophical methods and aptitudes towards academic progression and research.

PSO5: Enhance philosophical skills of interpreting social systems, structures, and values for social integration or transformation.

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

	I SEMESTER		
	PAPER	**Hours**	**Cr**
	Core		
22PPHC11	1. Formal Logic	06	05
22PPHC21	2. Classical Indian Philosophy	06	05
22PPHC31	3. Ancient and Medieval Western Philosophy	06	05
22PPHC41	4. Ethics	06	05
22PPHE11	**Core Elective – 1a:** Advanced General Psychology **Core Elective – 1b:** Advanced Social Psychology	06	04
	Total	**30**	**24**
	II SEMESTER		
	Core		
22PPHC52	5. Contemporary Indian Philosophy	06	05
22PPHC62	6. Modern Western Philosophy	06	05
22PPHC72	7. Research Methodology in Philosophy	06	05
22PPHE22	**Core Elective – 2a:** Socio-Political Philosophy **Core Elective – 2b:** Process Philosophy	06	04
22PPHN12	**Non-Major Elective:** Logic and Test of Reasoning	04	04
22PLFS12	**Life Skills**	2+2*	02
	Total	**30**	**25**
	III SEMESTER		
22PPHC83	8. Contemporary Western Philosophy	06	05
22PPHC93	9. Cosmology and Philosophy of Science	06	05
22PPHD03	10. Philosophy of Knowledge	06	05
22PPHD13	11. Metaphysics	06	05
22PPHE33	**Core Elective – 3a:** Philosophical Classic: The Republic **Core Elective – 3b:** Philosophical Classic: Philosophical Investigations	06	04
	Total	**30**	**24**
	IV SEMESTER		
	Core		
22PPHD24	12. Recent Trends in Western Philosophy	05	04
22PPHD34	13. Philosophical Anthropology	05	04
22PPHD44	14. Aesthetics	03	02
22PPHD54	15. PROJECT	12	05
22PPHE44	**Core Elective – 4a:** Philosophy, Anthropology, and Sociology of Religions **Core Elective – 4b:** Gandhian Philosophy	05	04
	Total	**30**	**19**
	Grand Total		**92**

Semester	I	II	III	IV	Total
Credits	24	25	24	19	**92**
Core					**70**
Core Electives					**16**
Non-Major Electives					**04**
Life Skills					**02**
Total					**92**

* 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

Class : M.A. Philosophy	**Part** : Core – 9
Semester : III	**Hours** : 90
Course Code : 22PPHC93	**Credit** : 05

COSMOLOGY AND PHILOSOPHY OF SCIENCE
(For those who joined in June 2022 onwards)

Course Objectives:

The course deals with the physical situation that is the context in the large for human existence. The universe has such a nature that our life is possible. This means that although it is a physical science, it is of particular importance in terms of its implications for human life. This course helps the students to understand the philosophical explanation of the fundamentals of science, scientific theories, and the epistemological dimension of scientific inquiry.

Course Content:

Unit 1: Basic in Cosmology 18 Hours
(a) Cosmology: Meaning - Scope – Nature; **(b)** Nature of Physical Laws: Teleological View Vs Mechanical View; **(c)** Origin of the Universe: Big Bang Theory – Steady State Theory; **(d)** Philosophical Response: Creationism – Evolutionism; **(e)** Purpose in Nature: Teilhard de Chardin's Vision of the World – Stephan Hawkins on Creation

Unit 2: Understanding Quantum Mechanics 18 Hours
(a) Quantum Theory: Classical Physics – Quantum Physics; **(b)** Theory of Relativity: Special Relativity – General relativity; **(c)** Space and Time: Problem of Space and Time – Uncertainty Principle – String theory

Unit 3: Introduction to Science 18 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)** Scientific Reasoning: Deduction – Induction; **(d)** Problem of Induction: Hume's Problem – Causal Inference – Probability and Scientific Inference – Rule of Conditionalization;

Unit 4: Explanation in Science 18 Hours
(a) Scientific method: Formulation of Hypothesis - Formulation of Theory; **(b)** Hempel's Covering Law Model: Deductive-Nomological Model – Inductive Statistical Model; **(c)** Pragmatic Theory of Explanation: Illocutionary Acts – Evaluation of Pragmatic Theory; **(d)** Causal Explanation: Salmon's Causal Mechanical Account – Mechanistic Explanation

Unit 5: Changes, Revolutions, and Values in Science 18 Hours
(a) Realism and Anti-realism: Scientific Realism and Anti-realism; **(b)** Observable and Unobservable Distinction – Underdetermination Argument; **(c)** Thomas Kuhn – Karl Popper - Paul Feyerabend – Feminists Contribution; **(d)** Values and Objectivity of Science: Merton's Ethos of Science – Cassius Longinus on Contextual Values; **(e)** Science and Human Interests: Decisions about Research Directions and Methods.

References:

1. Bird, A. (2003). *Philosophy of science*. Routledge.
2. Bondi, H. (2010). *Cosmology*. Dover Publications.
3. Coles, P. (2001). *Cosmology: A very short introduction*. OUP.
4. Gorham, G. (2009). *Philosophy of science: A beginner's guide*. One world Publication.
5. Rosenberg, A. (2000). *The philosophy of science*. Routledge.
6. Staley, W. (2014). *An introduction to the philosophy of science*. Cambridge University Press.

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	Understand the cosmological nuances	**K2**
CO2	Understand the different perspective of quantum mechanics in science	**K5**
CO3	Understand various explanations in science	**K2**
CO4	Analyse and evaluate the changes in science	**K5**
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	2	2	-	-	3	-	1	2	2	3	2	2	-	19
CO2	2	3	-	2	-	-	-	2	3	2	3	2	-	19
CO3	3	2	-	2	2	-	1	2	2	2	2	2	1	21
CO4	2	2	2	2	-	2	-	-	3	2	3	2	1	21
CO5	3	2	-	2	-	2	1	-	2	3	2	3	2	22
Grand Total of Cos with POs & PSOs														102
Mean value of COs With PSOs & POs = 102/48														2.13

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

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

Class : M.A. Philosophy	Part : Core - 10
Semester : III	Hours : 90
Course Code : 22PPHD03	Credits : 05

Philosophy of KNOWLEDGE

(For those who joined in June 2022 onwards)

Course Objectives:

The course introduces the students to the world of knowledge to analyse and evaluate its possibility, sources, and justification. It helps them to explain different approaches to truth and to the theory of knowledge.

Course Content:

Unit 1: The Possibility of Knowledge   **18 hours**

(a) Nature and Scope of Epistemology; (b) Knowledge and its types – Knowledge as justified true belief**:** Gettier problem; **(c) Ancient Skepticism:** Ancient School of Skepticism – Academics and Pyrrhonians; **(d) Modern Skepticism:** Challenge of Skepticism – Knowledge of the External World – Tracking Truth – Relevant Alternatives Model – Defense of Common Sense

Unit 2: Sources of Knowledge   **18 hours**

(a) Perception: Direct Realism – Indirect Realism – Rejecting Realism; **(b)** *Testimony:* Hume's Account of Testimony – Reid's Account of Testimony – Transmission and Generation Questions; **(c) A Priori Knowledge:** Knowledge, Reason and Experience – Rationalism and Empiricism – Synthetic A Priori – Self-Evidence and Certainty – Innate Knowledge

Unit 3: Theories of Truth   **18 hours**

(a) Inflationist Theories: Correspondence theory – Coherence theory – Pragmatic theory — Verificationist theory – Constructivist theory; **(b) Deflationist Theories:** Redundancy theory – Performative theory – Tarski's Semantic theory – Prosentential theory; **(c) Aletheiatic theories of truth**

Unit 4: Justification of Knowledge   **18 hours**

(a) Foundationalism: Traditional Foundationalism – Myth of the Given – Perceptual Experience and Thought – Modest Foundationalism; **(b) Coherentism:** A Holistic Conception of Justification – Concept of Coherence – Problems for Coherentism; **(c) Internalism and Externalism:** Internalism – Externalism – Arguments for Externalism – Arguments against Externalism – Epistemic Pluralism

Unit 5: Recent Approaches to Epistemology   **18 hours**

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

References:

1. Audi, R. (2011). *Epistemology: A contemporary introduction to the theory of knowledge*. Routledge.
2. Basu, S. (2003). *Justification: Concepts and theories*. Progressive Publishers.
3. Feldman, R. (2003). *Epistemology*. Prentice Hall.
4. Karuvelil, G. (1997). *Epistemology*, Jnana-Deepa Vidyapeeth.
5. O'Brien, D. (2017). *An introduction to the theory of knowledge*. 2nd ed. Polity.
6. Pojman L. P. (2001). *What can we know: An introduction to the theory of knowledge*. Wadsworth.
7. Pritchard, D. (2014). *What is this thing called knowledge?* 3rd 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.	*At the end of the course, students will be able to*	Knowledge Level up to
CO1	**Evaluate** the possibility of knowledge	**K5**
CO2	**Assess** the soundness of the sources of knowledge	**K5**
CO3	**Estimate** the strengths and weaknesses of different theories of truth	**K5**
CO4	**Interpret** the factors justifying knowledge	**K5**
CO5	**Consider** the contributions of the recent approaches to 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	-	-	-	-	3	2	3	1	3	20
CO2	3	-	3	1	-	-	-	1	3	2	3	1	3	17
CO3	3	3	3	2	1	-	1	2	3	2	3	1	3	28
CO4	3	2	2	2	1	-	-	2	3	2	3	1	3	23
CO5	3	2	2	3	2	-	3	3	3	2	3	2	3	32
Grand Total of Cos with POs & PSOs														121
Mean value of COs With PSOs & POs = 121/52														2.33

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

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

Class	: II M.A. Philosophy	Part	: Core Ele. – 3
Semester	: III	Hours	: 75
Course Code	: 22PPHE33 (A)	Credits	: 04

PHILOSOPHICAL CLASSIC: THE REPUBLIC
(For those who joined in June 2022 onwards)

Course Objectives:

The course helps the students to acquire the methodology of textual analysis, especially to read a philosophy classic from the context of its origin and author's background, and decipher its relevance today.

Course Content:

Unit 1: Textual Analysis and Context of the Text   **15 hours**

Methodology of Textual Study - General Introduction to the Author and the Text – Political Context of Greek City-states – Philosophical Responses to Political and Economic Conditions – Sophists – Socrates – Life and Background of Plato – Dialogues of Plato

Unit 2: Introduction to The Republic   **15 hours**

Introduction – Major Themes – Style – Division into Books – Relation between Metaphysics and Politics – Political Crisis – Different Definitions of Justice

Unit 3: Psychology   **15 hours**

Division of Soul – Education – Virtues – Division of Society – Philosopher King – Justice in the City

Unit 4: Metaphysics and Epistemology   **15 hours**

Theory of Forms – Problem of Universals – Simile of the Divided Line – Allegory of the Cave

Unit 5: Five Regimes   **15 hours**

Aristocracy – Timocracy – Oligarchy – Democracy – Tyranny

Books for Study: Classical Text for Study:

Plato. (2015). *The Republic*. Fingerprint Publishing.

Books for Reference:

1. Copleston, F. (2018). *A history of philosophy* (Vol. 1). Bloomsbury Continuum.

2. Ferrari, G. R. F. (Ed.) (2007). *The Cambridge companion to Plato's Republic*. Cambridge University Press.
3. Taylor, T. (2010). *Introduction to the philosophy and writings of Plato.* Watchmaker Publishing.

Teaching and Learning Methods:
- Lecture, Video presentation and analysis, Classroom Presentation, Textual Reading, Group discussion, Assignments

Course Outcomes (COs):

CO No.	*At the end of the course, students will be able to*	Knowledge Level up to
CO1	Analyse the text in its context	K4
CO2	Evolve a theory of justice by analysing different concepts of justice	K6
CO3	Formulate a theory of education for the formation of a balanced person	K6
CO4	Relate philosophy with public sphere	K3
CO5	Assess the strength and weakness of political systems	K4

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	2	-	-	-	3	3	2	3	2	24
CO2	3	3	2	2	2	-	-	-	3	3	2	2	2	24
CO3	3	3	2	2	2	-	-	-	3	3	3	2	2	25
CO4	3	3	2	2	2	-	-	-	3	3	2	2	2	24
CO5	3	2	2	2	2	2	-	-	3	3	2	2	2	25
Grand Total of Cos with POs & PSOs														122
Mean value of COs With PSOs & POs = 122/51														2.39

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

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

Class : II M.A. Philosophy	Part : Core Ele. – 3
Semester : III	Hours : 75
Course Code : 22PPHE33 (B)	Credits : 04

PHILOSOPHICAL CLASSIC: PHILOSOPHICAL INVESTIGATIONS
(For those who joined in June 2022 onwards)

Course Objectives:

The course helps the students to acquire the methodology of textual analysis, especially to read a philosophy classic from the context of its origin and author's background, and decipher its relevance today.

Course Content:

Unit 1: Philosophical Investigations: Method and Context   15 hours

    (a) The method: Seeing the *Philosophical Investigations* as a dialectic, interlocutory, and therapeutic

    (b) Context: Historical and philosophical

Unit 2: Important Themes   15 hours

    The absence of fixed meaning – Challenging the aim of philosophy – Rule-following, Interpretation, and Justification – Privacy – Forms of life – Grammatical Investigation

Unit 3: The Critique of Referential Theories of Meaning and the Paradox of Ostension: §§1–64

                                                             15 hours

    (a) Augustine on language learning: §1
    (b) Language-games: §§1–25
    (c) The paradox of ostensive definition: §§26–38
    (d) Subliming names: §§39–64

Unit 4: The Critique of Rule-Based Theories of Meaning and the Paradox of Explanation and Paradoxes of Rule-Following   15 hours

    (a) Rule-based theories and the paradox of explanation: The general form of the proposition and the paradox of explanation: §§65–88 - Subliming logic: §§89–133 - Metaphysical and everyday use and the paradox of intentionality: §§89–133 and §§428–436

    (b) Rule-based theories and Paradoxes of rule-following: The paradoxes of rule-following - Subliming rules

Unit 5: The Critique of a Private Language and the Paradox of Private Ostension: §§243–268

15 hours

(a) On the very idea of a private language: §§243–255
(b) The paradox of private ostension: §§256–268

Books for Study: Classical Text for Study:

Wittgenstein, L. (2009). *Philosophical Investigations*. Wiley-Blackwell.

Books for Reference:

1. O'Sullivan, M. (2017). *An analysis of Ludwig Wittgenstein's philosophical investigations.* The Macat Library.
2. Stern G. D. (2004). *Wittgenstein's philosophical investigations*. Cambridge University Press.

Teaching and Learning Methods:

- Lecture, Video presentation and analysis, Classroom Presentation, Textual Reading, Group discussion, Assignments

Course Outcomes (COs):

CO No.	*At the end of the course, students will be able to*	Knowledge Level up to
CO1	Learn dialectic, interlocutory and therapeutic methods	K2
CO2	Compare ideal language with ordinary language philosophy	K5
CO3	Appreciate different functions of language	K4
CO4	Relate philosophy of language with public sphere	K3
CO5	Identify the impact of philosophy of language	K4

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	2	-	-	-	3	3	2	3	2	24
CO2	3	3	2	2	2	-	-	-	3	3	2	2	2	24
CO3	3	3	2	2	2	-	-	-	3	3	3	2	2	25
CO4	3	3	2	2	2	-	-	-	3	3	2	2	2	24
CO5	3	2	2	2	2	2	-	-	3	3	2	2	2	25
Grand Total of Cos with POs & PSOs														122
Mean value of COs With PSOs & POs = 122/51														2.39

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

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

Class	: M.A. Philosophy	Part	: Core-14
Semester	: IV	Hours	: 45
Course Code	: 22PPHD44	Credits: 02	

AESTHETICS

(For those who joined in June 2022 onwards)

Course Objectives:

This course deals with the nature of art, beauty, and taste with the creation and appreciation of beauty. It is more scientifically defined as the study of sensory or sensory-emotional values of art or the activities of making and appreciating art with different aesthetic theories and concepts both in western and eastern philosophy.

Course Content:

Unit 1: Introduction to Aesthetics   **9 hours**

Definition - Nature and Scope – Aesbthetic object – Aesthetic judgment – Aesthetic Art, expression and experience

Unit 2: Indian aesthetics   **9 hours**

Bharata: *Natyasasthra and Rasa* – Anandavardhana: Rasa theory – Abinavagupta: Dhvani theory

Rabindranath Tagore: Art and Aesthetics

Unit 3: Western Aesthetics: Ancient and Medieval   **9 hours**

Ancient Period: Pre-Socratic Greek Classics – Socrates – Plato – Aristotle; Medieval Period: Augustine - Aquinas

Unit 4: Western Aesthetics: Modern and Postmodern   **9 hours**

Renaissance Art – Modern Art: Immanuel Kant – Postmodern Art: Jean-Francois Lyotard – Contemporary Art: Theodor Adorno

Unit 5: Postcolonial Aesthetics   **9 hours**

Postcolonialism – Postcolonial literary criticism- Postcolonial Aesthetics – Double colonization and Triple oppression-Gender and Racial Postcolonial Aesthetic Criticism

References:

1. Adorno, T. (1997). *Aesthetic theory*. Continuum.
2. Amaladass, A. (2000). *Introduction to aesthetics*. Satya Nilayam.
3. Barlingay, S. (2007). *A modern introduction to Indian aesthetic theory: The development from Bharata to Jagannatha.* D. K. Printworld.
4. Dewey, J. (1980). *Art as experience*. A Wideview/Perigee book.
5. Gupta, S. (1999). Art, Beauty and Creativity: Indian and Western aesthetics, D.K. Print world.
6. Raja, K. K. (1963). *Indian theory of meaning*. Adyar Library and Research Centre.

7. Rao, B. T. (2005). *Aesthetics: Modern and postmodern*. Bharatiya Kala Prakashan.
8. Sharma, M. (2007). *Music aesthetics*. A. P. H. Publications.
9. Shyamala, G. (1999). *Art, beauty and creativity: Indian and western aesthetics*. D. K. Printworld.

Teaching and Learning Methods:
- Class Lectures, Visual learning, Application in creative artifacts, Small research work

Course Outcomes (COs)

CO No.	At the end of the course, students will be able to	Knowledge Level up to
CO1	Understand and describe aesthetic concepts and make aesthetic choices	**K1**
CO2	Analyze and appreciate Natya in Indian Aesthetic tradition	**K4**
CO3	Evaluate the application of Aesthetics in Arts, Religion and life	**K5**
CO4	Compare and contrast the epistemological Aesthetics of Modern and Post-Modern philosophers	**K4**
CO5	Apply and appraise aesthetic theories on power relations and discriminations	**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	2	-	2	-	-	-	1	1	3	1	2	1	16
CO2	2	2	-	1	-	-	-	1	2	2	3	1	2	16
CO3	2	1	-	-	-	1	2	2	1	2	3	1	2	17
CO4	2	1	2	-	-	1	-	2	1	2	3	2	1	17
CO5	2	2	2	2	1	2	1	1	1	2	1	1	1	19
Grand Total of Cos with POs & PSOs														85
Mean value of COs With PSOs & POs = 85/51														1.67

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

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

Class	: II M.A. Philosophy	Part	: Core Ele. – 4
Semester	: IV	Hours	: 75
Course Code	: 22PPHE44 (B)	Credits	: 04

GANDHIAN PHILOSOPHY

(For those who joined in June 2022 onwards)

Course Objectives:

The course helps the students to rediscover the value of Gandhian philosophy as an alternative to the mainstream socio-political and economic paradigms. The students learn to be the volunteers of world peace and eco-friendly.

Course Content:

Unit 1: Gandhian Philosophy 15 hours

Gandhi's Life and Message – Major Influences on Gandhi – Truth and Non-violence – Satyagraha and Passive Resistance – Gandhi's view of Religion

Unit 2: Social Order 15 hours

Varnashrama Dharma and Untouchability; Upliftment of "Harijans", Women and Other Weaker Sections of Society – Gandhian Secularism – Approach to other Cultures and Religions

Unit 3: Sarvodaya 15 hours

Decentralized system of Economy – Economic Equality – Voluntary Poverty – Bread Labour – Labour Intensive Technology – Village Swaraj – Khadi and Village Industries, Agriculture, Panchayat Raj

Unit 4: Women Liberation 15 hours

Women's Status and Role in Society, Marriage and Sex, Women's Education, Political participation.

Unit 5: Preservation of Environment 15 hours

Mechanisation and Industrialisation – Waste Management – Conservation of Natural Resources.

References:

1. Gandhi, M. (2000-2001). *The collected works of Mahatma Gandhi.* Publications Division, Ministry of Information and Broadcasting, Govt. of India*.*
2. Gandhi, & Kumarappa, B. (1961). *Non-violent resistance (Satyagraha).* Schocken Books.
3. Das, B. (Ed.) (2020). *Gandhian thought and communication*. SAGE Publications Pvt. Ltd. https://dx.doi.org/10.4135/9789353287849

4. Fischer L. (1983). *The life of Mahatma Gandhi*. Harper & Row.
5. Gandhi, & Desai, M. H. 1. (1993). *An autobiography: The story of my experiments with truth.* (American ed.). Beacon Press.
6. Gandhi, M., & Dalton, D. (1996). *Mahatma Gandhi: Selected political writings*. Hackett Pub. Co.

Teaching and Learning Methods:
- Lecture, Video presentation, Book review, Classroom Presentation, Group discussion, Assignments

Course Outcomes (COs):

CO No.	At the end of the course, students will be able to	Knowledge Level up to
CO1	Examine the merit of Gandhian philosophy	K5
CO2	Evaluate the existing social order and propose alternative path towards a just and harmonious society	K5
CO3	Evaluate the existing economic system and propose alternative economy for the welfare of all	K5
CO4	Examine the strategies for gender equity and liberation	K5
CO5	Become environmentally sensitive and develop preservation techniques at local level	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	2	-	2	2	3	3	2	2	3	29
CO2	3	3	2	2	2	-	2	2	3	3	2	2	3	29
CO3	3	3	2	2	2	-	2	2	3	3	2	2	3	29
CO4	3	3	2	3	2	-	2	2	3	3	2	2	3	30
CO5	3	3	2	3	2	-	2	2	3	3	2	2	3	30
Grand Total of Cos with POs & PSOs														147
Mean value of COs With PSOs & POs = 147/60														2.45

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

DEPARTMENT OF MATHEMATICS

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF MATHEMATICS
B.Sc. MATHEMATICS
CBCS - OBE PATTERN (From 2022 – 2023 onwards)

PART	Course Code	Course Title	Hrs	Cr
I SEMESTER			
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
		TOTAL	**30**	**23**
II SEMESTER			
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
		TOTAL	**30**	**26**
III SEMESTER			
I	22UTAL33/ 22UHNL33/	Tamil / Hindi / French	06	04

	22UFNL33			
II	22UENA33 22UENB33	English Through Literature I - Stream A English Through Literature I - Stream B	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
	22USBE13	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	-	-
		TOTAL	**30**	**22**
IV SEMESTER				
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	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
	22USBE24	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
		TOTAL	**30**	**24**
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	05
	22UMAP15	Core Lab Numerical Methods using C++ Lab		
	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

			TOTAL	30	25
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	
		Core Elective Lab Java Programming Lab / R Programming Lab	02	01	
V	22USSI16	Soft Skills – II	02	01	
		TOTAL	30	24	

Semester	I	II	III	IV	V	VI	Total
Credits	23	26	22	24	25	24	**144**

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
     Total   **08** credits

Credits	Part I	Part II	Part III	Part IV	Part V	Total
	16	16	92	12	08	**144**

Self-Learning Courses

Semester	Course Code	Course Title	Credits
III		Solar System	03
IV		Stellar Universe	03
V		Statistical Methods in Social Sciences	03
VI		Mathematical Methods in Business	03

Value Added Courses (Certificate Course - 30 hours)
Data Analysis using R
Introduction to LaTeX
Data Analysis using Python
Introduction to Machine Learning
Career Oriented Courses
Quantitative Reasoning
Mathematics for Competitive Examinations
Resource Management Techniques
Optimization Techniques in Production

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATUR – 625 514
DEPARTMENT OF MATHEMATICS
Sequences and Series
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II B.Sc. Mathematics	**Part**	: III/Core-5
Semester	: III	**Hours**	: 90
Course Code	: 22UMAC53	**Credits**	: 5

Objective:

This course will enable the students to gain profound knowledge on the various characteristics of sequences and series.

Course Content:

Unit 1: **Sequences :** Bounded sequences – monotonic sequences – convergent sequences – divergent and oscillating sequences – algebra of limits – behavior of monotonic sequences **(18 hours)**

Unit 2: **Theorems on limits :** Cauchy's limit theorems - subsequences – limit points – Cauchy sequences – Cauchy's general principle of convergence for sequences – upper and lower limits of a sequence **(18 hours)**

Unit 3: **Series of positive terms :** Infinite series – convergence, divergence and oscillation of series – Cauchy's general principle of convergence for series – comparison test **(18 hours)**

Unit 4: **Tests of Convergence :** Kummer's test – D'Alembert's ratio test – Raabe's test – Gauss's test – Cauchy's root test and condensation test – Cauchy's integral test **(18 hours)**

Unit 5: **Series of arbitrary terms :** Alternating series – Leibnitz's test – absolute convergence – conditional convergence – tests for convergence of series of arbitrary terms – Dirichlet's test – Abel's test **(18 hours)**

Book for Study:

Arumugam S., Thangapandi Issac A., "Sequences and Series", New Gamma Publishing House, Palayamkottai, 2019.

Unit 1	:	Chapter 3	sections 3.1 to 3.7
Unit 2	:	Chapter 3	sections 3.8 to 3.12
Unit 3	:	Chapter 4	sections 4.1 to 4.2
Unit 4	:	Chapter 4	sections 4.3 to 4.5
Unit 5	:	Chapter 5	sections 5.1 to 5.3

Books for Reference:

1. SC Malik, Savita Arora, Mathematical Analysis, New Age International Private Limited, Publications, 5th multicolour edition, New Delhi 2016, Reprint.
2. Richard R. Goldberg, Methods of Real Analysis, Oxford and IBH Publishing Co., 2017.

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	Explain the definitions of the fundamental concepts of sequences with examples	K2
CO2	Find the limit of sequences and illustrate the nature of Cauchy sequences	K2
CO3	Analyze the nature of series by applying various tests.	K4
CO4	Apply different kinds of test of convergence for series	K3
CO5	Use the tests of convergence of series of arbitrary terms	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			2	2			3	2		2	2	19
CO2	3	3			2	2			3	2		2	2	19
CO3	3	3			2	3			3	3		2	2	21
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														97
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{97}{40}$														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 Sequences & Series are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
Analytical Geometry of 3D and Vector Calculus
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II B.Sc. Mathematics	**Part**	: III/ Allied - 3
Semester	: III	**Hours**	: 75
Course Code	: 22UMAA33	**Credits**	: 4

Objective:

This course will make the learners acquire intense knowledge on solving problems associated with three dimensional objects, vector differentiation and vector integration and also gain hands on experience in solving problems using Geogebra software.

Course Content:

Unit 1: **Planes :** Equation of a plane – angle between two planes – angle bisectors of two planes – hands on training on solving problems based on planes using Geogebra **(15 hours)**

Unit 2: **Straight lines** : Equation of a straight line – non-symmetric form – symmetric form – two points form – plane and a line – skew lines –equation of two skew lines in a simple form – intersection of three planes – hands on training on solving problems based on straight lines using Geogebra **(15 hours)**

Unit 3: **The Sphere**: Equation of a sphere – centre radius form – general form of a sphere – diameter form – tangent line and tangent plane – angle of intersection of two spheres – section of a sphere– hands on training on solving problems based on sphere using Geogebra **(15 hours)**

Unit 4: **Vector Differentiation**: Vector algebra – differentiation of vectors –gradient – geometrical interpretation – equation of the tangent plane – equation of the normal line – divergence and curl– harmonic vector. **(15 hours)**

Unit 5: **Line and Surface Integrals**: Line integrals – work done by a force – surface integrals – theorems of Green, Gauss and Stokes **(15 hours)**

Book for Study:
S.Arumugam and A.Thangapandi Isaac, Analytical Geometry 3D and Vector Calculus, New Gamma Publishing House,2018.

Unit 1	:	Chapter 2	Section 2.1-2.21
Unit 2	:	Chapter 3	Section 3.1-3.44
Unit 3	:	Chapter 4	Section 4.1-4.21
Unit 4	:	Chapter 5	Section 5.1-5.28
Unit 5	:	Chapter 7	Section7.1-7.29

Books for Reference:
1. K.Manicavachagom Pillay and T.Natarajan, S.Viswanathan, Analytical Geometry Part II – Three Dimensions by Printers & Publishers Pvt. Ltd. 2017.
2. S.Narayanan and T.K.Manicavachagom Pillay, S.Viswanathan, Vector Calculus by Printers & Publishers Pvt. Ltd. 2017.

Teaching Learning Methods:
- Lecture Method, Assignment, Quiz, Group Discussion

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level Up to
CO1	Find the equation of plane and compute the angle between the planes	K3
CO2	Classify skew lines and coplanar lines; compute the shortest distance between lines	K3
CO3	Construct the equation of the sphere of various forms and its section.	K3
CO4	Employ vector differentiation to calculate the gradient of functions and categorize vectors	K3
CO5	Apply the fundamental theorems of calculus to find the relationship between different types of integrals	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			2	2			3	2	3	2	2	22
CO2	3	3			2	2			3	2	3	2	2	22
CO3	3	3			2	2			3	2	3	2	2	22
CO4	3	3			2	2			3	2	3	2	2	22
CO5	3	3			2	2			3	2	3	2	2	22
Grand Total of Cos with POs & PSOs														110
Mean Value of COs with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{110}{45}$														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 Analytical Geometry of 3D & Vector Calculus are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATUR – 625 514
DEPARTMENT OF MATHEMATICS
Mathematics for Competitive Examinations
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II B.A. (Arts)	**Part**	: IV/NME-1
Semester	: III	**Hours**	: 45
Course Code	: 22UMAN13	**Credits**	: 2

Objective:
This course intends to make the learners gain competency of solving problems in competitive examinations.

Course Content:

Unit 1: Highest common factor – factorized method – division method - least common multiple – factorized method – shortcut method **(9 hours)**

Unit 2: Simplification - various algebraic formulas and their applications – simplify the rule of BODMAS – square roots– cube roots **(9 hours)**

Unit 3: Percentage- results on population – result on depreciation – reduction percentage **(9 hours)**

Unit 4: Chain rule –Ratio - Proportion - Direct proportion – Indirect proportion **(9 hours)**

Unit 5: Calendar-odd days-leap Year-ordinary Year-counting of odd days-day of the week related to odd days. **(9 hours)**

Book for Study
R.S. Aggarwal, "Quantitative Aptitude", revised edition, S.Chand & Company Ltd, New Delhi, 2017.

      Unit 1 : Chapter 2
      Unit 2 : Chapters 4 & 5
      Unit 3 : Chapter 11
      Unit 4 : Chapter 14
      Unit 5 : Chapter 27

Books for Reference:
01. Ashish Aggarwal, "Quick Arithmetic", First Edition, S.Chand & Company Ltd., New Delhi, 2014.
02. Dinesh Khattar, "The Pearson Guide to Quantitative Aptitude", Third Edition, Dorling Kindersley Private Limited, New Delhi, 2010.

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 Up to
CO1	Employ various methods to find H.C.F and L.C.M.	K3
CO2	Apply various algebraic formulae in computing solutions to the problems	K3
CO3	Solve real life problems using the notion of percentage	K3
CO4	Use the aspects of chain rula to compute solutions to the problems.	K3
CO5	Compute solutions to the problems based on calendar	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	2			2	2			3	3	3	3	3	23
CO2	3	2			2	2			2	2	2	2	2	24
CO3	3	2			2	2			3	3	3	3	3	24
CO4	3	2			2	2			2	2	2	2	2	23
CO5	3	2			2	2			2	2	2	2	2	24
Grand Total of Cos with POs & PSOs														105
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{118}{45}$														2.33

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			2.33
Observation	Cos of Mathematics for Competitive examinations are strongly correlated with POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
Solar system
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	**: II UG**	**Part**	**: SLC**
Semester	**: III**	**Credits**	**: 3**
Course Code	**: 22UMASL3**		

Objective:

This course enables the learners to gain more insights on solar structure and elements of solar system

Course outline:

Unit 1: Introduction – planetesimal hypothesis – surface structure of the sun – solar constant

Unit 2: Surface structure of mercury - Venus and Mars

Unit 3: Discovery of the minor planets – Asteroids – surface structure of Jupiter and Saturn.

Unit 4: Discoveries of Uranus, Neptune and Pluto

Unit 5: Meteors – zodiacal light – difference between the planets and comets

Book for Study:

Kumaravelu, Susheela Kumaravelu, "Astronomy", Reprinted, Sri Vishnu Arts, 2004.

Unit 1: Chapter 14   sections 321, 322
Unit 2: Chapter 14   sections 323 - 325
Unit 3: Chapter 14   sections 326 - 328
Unit 4: Chapter 14   sections 329 - 331
Unit 5: Chapter 14   sections 332 – 334

Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, Group Discussion

On completion of this course the student will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Retrieve the fundamentals of solar structure	**K1**
CO2	Summarize the features of planets	**K2**
CO3	Explain the structure of minor planets	**K2**
CO4	Explicate the composition of outer most planets	**K2**
CO5	Describe the differences between planets , meteors and comets	**K2**

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	2		2		2			2		2		2	15
CO2	3	2		2		2			2		2		2	15
CO3	3	2		2		2			2		2		2	15
CO4	3	2		2		2			2		2		2	15
CO5	3	2		2		2			2		2		2	15
Grand Total of Cos with POs & PSOs														75
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{75}{35}$														2.14

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			2.14
Observation	Cos of Solar system are strongly correlated with POs		

MECHANICS

(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II B.Sc. Mathematics	**Part**	: III/Core-6
Semester	: IV	**Hours**	: 90
Course Code	: 22UMAC64	**Credits**	: 5

Objective:

This course aims in making the students acquire profound knowledge and applications of the changes in physical systems both under rest and motion.

Course Content:

Unit 1:   **Forces acting at a point**: Resultant and components – simple cases of finding the resultant – parallelogram of forces – analytical expression for the resultant of two forces acting at a point– Triangle of forces – perpendicular Triangle of forces – converse of the Triangle of forces – polygon of forces – Lami's theorem – extended form of parallelogram law of forces – resolution of a force –component of a force along two given directions – theorem on resolved parts –resultant of any number of forces acting at a point –resultant of coplanar forces – conditions of equilibrium of any number **(18 hours)**

Unit 2:   **Parallel forces and Moments** : Resultant of two like parallel forces acting on a rigid body – resultant of two unlike and unequal parallel forces acting on a rigid body – resultant of a number of parallel forces acting on a rigid body – condition of equilibrium of three coplanar parallel forces – centre of two parallel forces – moment of a force– physical significance of the moment of a force – sign of the moment – unit of moments – Varignon's theorem of moments –generalized theorem of moments **(18 hours)**

Unit 3:   **Stability of Equilibrium:** Stable, unstable and neutral equilibrium- nature of equilibrium of a rigid body supported at one fixed point- conditions of stability for a body with one degree of freedom-stability of rocking stones – important particular cases **(18 hours)**

Unit 4:   **Projectiles** : Two fundamental principles – path of a projectile is a parabola – characteristics of the motion of projectile – particle projected horizontally from a certain height – maximum horizontal range of the projectile with velocity and magnitude of projection – two possible directions of projections with initial velocity – velocity and magnitude of the projectile at the end of time –velocity of the projectile for a freely falling body –two directions of projection **(18 hours)**

Unit 5:   **Collision of Elastic Bodies**: Fundamental law of Impacts – Newton's experimental law – motion of two smooth bodies perpendicular to the line of impact – Principle of conservative momentum –impact of a smooth spheres on a fixed smooth plane – Direct impact of two smooth spheres- loss of kinetic energy due to impact of two smooth spheres – **(18 hours)**

Books for study:

01. Venkatraman, M.K., "Statics, Eighteenth Edition", Agasthiar Publications, Trichy, 2016.

      Unit 1 :   Chapter 2   Sections 1 – 16

      Unit 2 :   Chapter 3   Sections 1 – 13

      Unit 3 :   Chapter 10   Sections 1 – 4

02. Venkatraman, M.K., "Dynamics, Eighteenth Edition", Agasthiar Publications, Trichy, 2016.

      Unit 4 :   Chapter 6   Sections 6.1 – 6.11

      Unit 5 :   Chapter 8   Sections 8.1 – 8.6

Books for Reference:

01. Duraipandian, P., Laxmi Duraipandian and Muthamizh Jayapragasm, "Mechanics", S.Chand and Company, 2003.

02. Narayanan, S., "Dynamics", S.Chand and Company, 16th Edition, New Delhi, 1986.

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	Explain various laws of forces and solve problems by applying the same	K3
CO2	Compare like and unlike parallel forces and employ Varignon's theorem in solving problems	K3
CO3	Use the concepts of stability of equilibrium in solving problems	K3
CO4	Explicate projectile and apply its properties to solve problems	K3
CO5	Apply the concept of impulsive forces in finding 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			2	2			3		3		2	18
CO2	3	3			2	2			3		3		2	18
CO3	3	3			2	2			3		3		2	18
CO4	3	3			2	2			3		3		2	18
CO5	3	3			2	2			3		3		2	18
Grand Total of Cos with POs & PSOs														90
Mean Value of Cos with POs & PSOs = $\frac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \frac{90}{35}$														2.6

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			2.6
Observation	Cos of Mechanics are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATUR – 625514
DEPARTMENT OF MATHEMATICS
Differential Equations and Applications
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II B.Sc. Mathematics	**Part**	: III/Allied-4
Semester	: IV	**Hours**	: 75
Course Code	: 22UMAA44	**Credits**	: 4

Objective:
This course will make the learners to gain knowledge in applying different methods of solving differential equations.

Course Content:

Unit 1: **Equation of first order & higher degree:** Bernoulli's Equation-Exact differential equations – Practical rule for solving an exact differential equation-equations of first order but of higher degree – equations solvable for x,y and p – Clairauts' equation-Equations that do not contain x explicitly
(15 hours)

Unit 2: **Linear equation with constant coefficients:** – The operator D-complementary function of a linear equation with constant coefficients-particular integral-general method for finding P.I-special methods for finding P.I- linear equations with variable coefficients – equations with reducible to the linear equations
(15 hours)

Unit 3: **Simultaneous differential equations:** simultaneous equations of first order and first degree- solutions of Lagrange's equations -Methods for solving Lagrange's equations- simultaneous linear differential equations-simultaneous equation with variable coefficients.
(15 hours)

Unit 4: **The Laplace transforms:** sufficiently conditions for the existence of the Laplace transform-Laplace transform of periodic functions- The inverse transform – solution of differential equations using Laplace transforms.
(15 hours)

Unit 5: **Applications of first order equations:** Growth, Decay and Chemical Reactions – Flow of water from an orifice-simple electric circuits
(15 hours)

Book for Study:
S.Narayanan, T.K.Manickavachagam Pillay," Differential Equations and its Applications", S.Viswanathan (Printers & Publishers), PVT., LTD.2018

Unit 1	:	Chapter 2	sections 5, 6
		Chapter 4	sections 1, 2, 3
Unit 2	:	Chapter 5	sections 1-6
Unit 3	:	Chapter 6	sections 1-7
Unit 4	:	Chapter 9	sections 1-7
Unit 5	:	Chapter 3	sections 1, 2 & 6

Books for Reference:

1. Arumugam and Issac, "Differential Equations and Applications", New Gamma Publishing House,Palayamkottai, 2014.
2. M.L Khanna, "Differential Equations", Jai Prakashnath & Co, Meerut, 1999.

Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, Group Discussion

Course Outcomes (CO):

On completion of this course the students will be able to

Course Outcome No.	Course Outcome	Knowledge Level
CO1	Compute solutions to differential equations of many kinds by applying various methods	K3
CO2	Apply the method of variation of parameters to solve linear differential equations.	K3
CO3	Employ the properties of Laplace transforms to solve differential equations	K3
CO4	Use Lagrange's and Charpit's methods to solve the partial differential equations	K3
CO5	Formulate and solve the differential equation representing the real life 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		2	2				3	2	2	2	2	21
CO2	3	3		2	2				3	2	2	2	2	21
CO3	3	3		2	2				3	2	2	2	2	21
CO4	3	3		2	2				3	2	2	2	2	21
CO5	3	3	2	2	2				3	2	2	2	2	23
Grand Total of Cos with POs & PSOs														107
Mean Value of Cos with POs & PSOs = $\frac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \frac{107}{46}$														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 withPOs & PSOs			2.3
Observation	**COs of Differential Equations and Applications are strongly correlated with POs & PSOs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATUR – 625 514
DEPARTMENT OF MATHEMATICS
Resource Optimization Techniques
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II B.Sc. (Other Sciences)	**Part**	: IV/NME-2
Semester	: IV	**Hours**	: 45
Course Code	: 22UMAN24	**Credits**	: 2

Objective:
This course enables the learners acquire intense knowledge and apply different optimization techniques to real life problems.

Course Content:

Unit 1: **Linear programming problem:** Introduction – Linear Programming Problem - Mathematical formulation of Problem - Graphical solution method.
(9 hours)

Unit 2: **Transportation problem:** Introduction – LP formulation of transportation problem- Solution of a transportation problem – Finding an initial basic feasible solution. **(9 hours)**

Unit 3: **Assignment problem:** Introduction – mathematical formulation of assignment problem – solution to an assignment problem – Travelling salesman problem.
(9 hours)

Unit 4: **Sequencing problem:** Introduction - Problem of sequencing – Basic Terms used in sequencing – Processing n jobs through two machine – Processing n jobs through k machines. **(9 hours)**

Unit 5: **Games and Strategies:** Introduction- Two-person Zero-sum Games - The Maximin - Minimax principle –Games without saddle points –mixed strategies. **(9 hours)**

Book for Study:
Kanti Swarup., Gupta P.K., Man Mohan "An introduction to management science operation research" Sultan Chand and sons educational publishers, new Delhi, fifteenth edition

Unit 1 :	Chapters 2,3	Sections: 2.1,2.4,3.2
Unit 2 :	Chapter 10	Sections: 10.1,10.2,10.8,10.9
Unit 3 :	Chapter 11	Sections: 11.1 – 11.3,11.7
Unit 4 :	Chapter 12	Sections: 12.1 – 12.5
Unit 5 :	Chapter 17	Sections: 17.1 – 17.5

Books for Reference:
01. Sharma., "Operations Research", 2nd Edition, Vikas Publishing House Private Limited, NewDelhi, 2002.
02. Arumugam.S., Thangapandi Isaac.A "Topics in operation research Linear programming" New gamma publishing house, Palayamkottai, March 2015.

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	Define and formulate linear programming problems and apply graphical method	**K3**
CO2	Be able to build and solve transportation models	**K3**
CO3	Use different methods to solve the assignment problems.	**K3**
CO4	Solve problems based on sequencing	**K3**
CO5	Apply game strategies to solve 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	2			2	2			3	3	3	3	3	23
CO2	3	2			2	2			2	2	2	2	2	24
CO3	3	2			2	2			3	3	3	3	3	24
CO4	3	2			2	2			2	2	2	2	2	23
CO5	3	2			2	2			2	2	2	2	2	24
Grand Total of Cos with POs & PSOs														105
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{118}{45}$														2.33

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			2.33
Observation	**Cos of Operations Research Techniques are strongly correlated with POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
Stellar Universe
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II UG	**Part**	: SLC
Semester	: IV	**Credits**	: 3
Course Code	: 22UMASL4		

Objectives:
This course enables the learners to acquire profound knowledge on stellar universe

Course Content:

Unit 1: Introduction – stellar motion – solar motion - distance of stars – magnitudes of stars

Unit 2: Apparent visual and photo visual magnitude/absolute magnitude

Unit 3: Colour and size of stars – dwarfs – main sequence stars – giants

Unit 4: Double and multiple stars – variable stars – novae – nebulae

Unit 5: Zodiacal constellations – winter, spring, summer, autumn constellations

Book for Study:
Kumaravelu, Susheela Kumaravelu, "Astronomy", Reprinted, Sri Vishnu Arts, 2004.

Unit 1 :	Chapter 17	sections: 335 - 339	
Unit 2 :	Chapter 17	sections: 340 - 342	
Unit 3 :	Chapter 17	sections: 343	
Unit 4 :	Chapter 17	sections: 344 - 348	
Unit 5 :	Chapter 17	sections: 349 – 352	

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	Retrieve the fundamentals of solar and stellar systems	**K1**
CO2	Summarize the magnitude of apparent and photo visuals	**K2**
CO3	Explain the formation of stars	**K2**
CO4	Explicate the different types of stars	**K2**
CO5	Describe zodiacal constellations of different seasons	**K2**

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	2		2		2			2		2		2	15
CO2	3	2		2		2			2		2		2	15
CO3	3	2		2		2			2		2		2	15
CO4	3	2		2		2			2		2		2	15
CO5	3	2		2		2			2		2		2	15
Grand Total of Cos with POs & PSOs														75
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{75}{35}$														2.14

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			2.14
Observation	**Cos of Stellar Universe are strongly correlated with POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF MATHEMATICS

QUESTION PAPER PATTERN (UG)
(Core, Core Elective, Allied and Non-Major Elective)
(For those who join from 2022 onwards)

INTERNAL (40 MARKS)

SECTION – A (4 x 1 = 4 marks)

FOUR multiple choice questions. Each question carries one mark. (K1, K2)

SECTION – B (2 x 4 = 8 marks)

TWO questions with internal choice. Each question carries four marks. (K3, K4)

SECTION – C (4 x 7 = 28 marks)
FOUR questions with internal choice. Each question carries seven marks. (K3, K4, K5)

EXTERNAL (100 MARKS)

SECTION – A (10 x 1 = 10 marks)
TEN multiple choice questions. Each question carries one mark. (K1, K2)

SECTION – B (5 x 6 = 30 marks)
FIVE questions with internal choice. Each question carries six marks. (K3, K4)

SECTION – C (5 x 12 = 60 marks)
FIVE questions with internal choice. Each question carries twelve marks. (K3, K4, K5)

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF MATHEMATICS

SCHEME OF EVALUATION (UG)

1. Continuous Internal Assessment

	Marks
Test – 1	40
Test – 2	40
Assignment / Seminar	20

Total	100
	------

2. Semester Examination   100 Marks

3. Total Marks = 50% C.I.A + 50% Semester Examinations

A candidate must score a minimum of 20 marks out of 50 in the semester examination and an overall aggregate minimum of 40 marks out of 100 for a pass.

DEPARTMENT OF MATHEMATICS
ARUL ANANDAR COLLEGE (AUTONOMOUS)
M.Sc. MATHEMATICS
CBCS – OBE PATTERN (From 2022 – 2023 onwards)

Nature of the Course	Course Code	Course Title	Hr	Cr
FIRST YEAR – FIRST SEMESTER				
Core	22PMAC11	**Core – 1** Modern Algebra	06	05
	22PMAC21	**Core – 2** Real Analysis	06	05
	22PMAC31	**Core – 3** Numerical Analysis	06	05
	22PMAC41	**Core – 4** Probability and Statistics	06	05
Core Elective	22PMAE11	**Core Elective – 1** Graph Theory/ Cryptography	06	04
		Total	**30**	**24**
FIRST YEAR – SECOND SEMESTER				
Core	22PMAC52	**Core – 5** Linear Algebra	06	05
	22PMAC62	**Core – 6** Measure and Integration	06	05
	22PMAC72	**Core – 7** Differential Equations	06	05
Core Elective	22PMAE22	**Core Elective – 2** Differential Geometry / Research Methodology	06	04
Non - Major Elective	22PMAN12	**Non-Major Elective** Numerical & Statistical Methods	04	04
Life Skills	22PLFS12	Life Skills	02	02
		MOOC / SWAYAM		02**
		Total	**30**	**25**
SECOND YEAR – THIRD SEMESTER				
Core	22PMAC83	**Core – 8** Topology	06	05
	22PMAC93	**Core – 9** Classical Mechanics	06	05
	22PMAD03	**Core – 10** Complex Analysis	06	05
	22PMAD13	**Core – 11** Operations Research	06	05
Core Elective	22PMAE33	**Core Elective – 3** Mathematical Modeling / Calculus of Variations	06	04
		MOOC / SWAYAM		02**
		Total	**30**	**24**
SECOND YEAR – FOURTH SEMESTER				
Core	22PMAD24	**Core – 12** Functional Analysis	06	05
	22PMAD34	**Core – 13** Fuzzy Sets and Applications	06	05
	22PMAD44	**Core – 14** Project	12	05
Core Elective	22PMAE44	**Core Elective – 4** Automata Theory / Fluid Dynamics	06	04
		Total	**30**	**19**

Semester	I	II	III	IV	Total
Credits	24	25	24	19	92

Self-Learning Courses 2

The students can undertake any online courses offered by SWAYAM during II & III semester

earn extra credit.

Credit   2   per course
Maximum   4   credits

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
TOPOLOGY
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II M.Sc. Mathematics	**Part**	: Core - 8
Semester	: III	**Hours**	: 90
Course Code	: 22PMAC83	**Credits**	: 5

Objective:

This course will enable the learners to comprehend and profusely analyze the concepts of topology

Unit 1   **Topological Spaces:** Topological spaces – definition of topological space – basis for a topology – order topology – product topology – projections – subspace topology

(18 hours)

Unit 2:   **Continuous Functions:** Closed sets and limit points – closure and interior of a set – Hausdorff space continuous functions – homeomorphism- the pasting lemma – metric topology – sequence lemma – uniform limit theorem.   **(18 hours)**

Unit 3:   **Connectedness and Compactness:** Connected spaces – definition – connected subsets in the real line – intermediate value theorem – path connected – Compact spaces – definition – tube lemma – finite intersection property – compact subspaces of the real line.   **(18 hours)**

Unit 4:   **Countability and Separation Axioms:** The countability axioms – Lindelof space – regular and normal space – the separation axioms – The Urysohn Lemma.

(18 hours)

Unit 5:   **Nets and Filters:** Definition and convergence of Nets- Topology and convergence of Nets – Filters and their convergences – Ultrafilters and compactness.

(18 hours)

Book for Study:

   01. James, R. Munkres, *Topology*, II Edition, Pearson India Education Services Pvt.Ltd,2015.

Unit 1 :	Chapter 2	sections 12 - 16
Unit 2 :	Chapter 2	sections 17 - 21
Unit 3 :	Chapter 3	sections 23 ,24,26 & 27
Unit 4:	Chapter 4	sections 30-33

   02. K.D. Joshi, Introduction to General Topology, I Edition, New Age International (p) Limited publishers

Unit 5:	Chapter 10	sections 1-4

Books for Reference:

1. George F. Simmons, *Introduction to Topology and Modern Analysis*, Tata McGraw-Hill, 16th Reprint, 2011.

2. Chandrasekhara Rao, K., *Topology*, Narosa Publishing House, 2nd Reprint, 2015.

Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, 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 various kinds of topologies with illustrations	**K3**
CO2	Deduce the implications of lemmas related to continuous functions	**K4**
CO3	Interpret on the theorems associated with connectedness and compactness	**K4**
CO4	Analyze the nature of separation axioms of the given topological spaces	**K4**
CO5	Construct the net and filters on given topological spaces	**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	2							3	2	3	3	3	19
CO2	3	2							3	2	3	2	2	17
CO3	3	2							3	2	3	2	2	17
CO4	3	2							3	2	2	3	2	17
CO5	3	2							3	2	3	3	2	18
Grand Total of Cos with POs & PSOs														88
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{88}{35}$														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 Topology are strongly correlated with POs & PSOs		

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ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
CLASSICAL MECHANICS
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II M.Sc. Mathematics	**Part**	: Core - 9
Semester	: III	**Hours**	: 90
Course Code	: 22PMAC93	**Credits**	: 5

Objectives :

This course facilitates the learners acquire intense knowledge and deep sense of analyzing on the characteristics of the dynamical systems.

Course Content:

Unit 1: **Survey of Elementary Principles :** Mechanics of a particle- Mechanics of a system of particles-Constraints-D'Alembert's principle and Lagrange's equations – velocity dependent potentials dissipative function – applications of Lagrangian formulation.

(18 hours)

Unit 2: **Variational Principles and Lagrange's Equation:** Hamilton's principle – some techniques of the calculus of variations – derivation of Lagrange's equations forms – Hamilton's principle – Hamilton's principle to non holonomic systems.

(18 hours)

Unit 3: **The Two-Body Central Force Problem:** The two-body central force problem – classification of orbits – Virial theorem – differential equation for the orbit and integrable power law potentials. **(18 hours)**

Unit 4: **The Kinematics of Rigid Body Motion:** Betrand's theorem – Kepler's problem inverse square law force – Kepler's equation of motion & first integrals – Laplace – Runge – Lenz Vector. **(18 hours)**

Unit 5: **The Hamilton Equations of Motion:** Legendre Transformations – the Hamilton equation of motion – Routh Procedure – derivation of Hamilton equation from variation principle – the principle of least action. **(18 hours)**

Book for Study:

Herbert Goldstein, "Classical Mechanics, 2nd Edition", Twentieth Reprint, Narosa Publishing House, New Delhi, 2007.

Unit 1 : Chapter 1 Sections 1.4 – 1.6
Unit 2 : Chapter 2 Sections 2.1 – 2.4
Unit 3 : Chapter 3 Sections 3.1 – 3.5
Unit 4: Chapter 3 Section 3.6 – 3.9
Unit 5: Chapter 8 Sections 8.1 – 8.3, 8.5, 8.6

Books for Reference:

1. D. T. Greenwood, "Classical Dynamics", Prentice Hall of India, New Delhi, 1985.
2. N.C.Rane and P.S.C.Joag, "Classical Mechanics", Tata McGraw Hill, 1991.

Teaching Learning Methods:
- Lecture Method, ICT, Assignment, Quiz, 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 Lagrangian's equation to various dynamical systems	**K3**
CO2	Employ Hamilton's principle to non-holonomic system	**K3**
CO3	Determine the differentiation of central orbits and apply the respective theorems to the problems	**K3**
CO4	Analyse the implications of Kepler's law	**K4**
CO5	Summarize the applications of Legendre's transformation	**K5**

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	2	2	3						3	2	3	2	2	19
CO2	2	2	3	2					3	2	3	2	2	21
CO3	2	2	3						3	2	3	2	2	19
CO4	3	2	3						3	2	3	2	2	20
CO5	2	2	2	2	2				3	2	3	2	2	22
Grand Total of Cos with POs & PSOs														101
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{101}{43}$														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 Classical Mechanics are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
Complex Analysis
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II M.Sc. Mathematics	**Part**	: Core - 10
Semester	: III	**Hours**	: 90
Course Code	: 22PMAD03	**Credits**	: 5

Objective :

This course aims in making the learners to explore the concepts of analytic functions, conformal mapping, singularities and harmonic functions.

Course Content:

Unit 1: **Analytic Function:** Polynomials – rational functions – sequences – series – uniform convergence – power series – Abel's limit theorem. **(18 Hours)**

Unit 2: **Conformality:** Analytic functions in regions – conformal mapping – length and area – **Linear Transformations:** cross ratio – elementary conformal mappings – elementary Riemann surfaces. **(18 Hours)**

Unit 3: **Complex Integration**: Line Integrals – line Integrals as functions of arcs – Cauchy's theorems – Cauchy's integral formula – higher derivatives. **(18 hours)**

Unit 4: **Local Properties of Analytical Functions**: Removable singularities – Taylor's theorem – zeros and poles – general form of Cauchy's theorem – calculus of residues – residue theorem – evaluation of definite integrals. **(18 hours)**

Unit 5: **Harmonic functions:** Poisson's formula – Schwarz's theorem – power series expansions – Weierstrass theorem – Taylor's series – Laurent series **(18 hours)**

Book for Study:

Lars V Ahlfors, "Complex Analysis", Tata McGraw-Hill International Edition, Singapore, Third Edition, 1979.

Unit 1: Chapter 2 Sections 1.2 – 1.4, 2.1 – 2.5
Unit 2: Chapter 3 Sections 2.2 – 2.4, 3.1 – 3.5, 4.1 – 4.3
Unit 3: Chapter 4 Sections 1.1, 1.3 – 1.5, 2.1 – 2.3
Unit 4: Chapter 4 Sections 3.1 – 3.4, 4.1, 4.4 – 4.6, 5.1 – 5.3
Unit 5: Chapter 4 Sections 6.1 – 6.4 &
Chapter5 Sections1.1 – 1.3

Books for Reference:

1. J.B. Conway, "Functions of one complex variables", Springer - Verlag, International student Edition, Narosa Publishing Co., 1978.

2. E. Hille, "Analytic function Theory", (2 vols.), Gonm & Co, 1959.

Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, 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	Analyze the nature of the analytical functions and find the radius of convergence of power series	**K4**
CO2	Test the conformality of mappings and compare various transformations	**K4**
CO3	Evaluate complex contour integrals by applying Cauchy's theorem and Integral formula	**K3**
CO4	Classify singularities and poles, find residues and evaluate complex integrals using the residue theorem.	**K4**
CO5	Illustrate and express the functions of a complex variable as Taylor's series and Laurent's series	**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							3	2	3	2	2	17
CO2	3	3			2				3	2	3	2	2	20
CO3	3	2			2				3	2	3	2	2	19
CO4	3	3			2				3	2	3	2	2	20
CO5	3	2							3	2	3	2	2	17
Grand Total of Cos with POs & PSOs														93
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{93}{38}$														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 Complex Analysis are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
OPERATIONS RESEARCH
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II M.Sc. Mathematics	**Part**	: Core - 11
Semester	: III	**Hours**	: 90
Course Code	: 22PMAD13	**Credits**	: 5

Objective:

This course will make the learners comprehend and apply different optimizing techniques

Course Content:

Unit 1: Integer Linear Programming: Illustrative Applications-Capital Budgeting, Set, Covering Problem, Fixed –Charge Problem, Either –Or And If-Then Constraints - Integer Programming Algorithms: Branch And Bound (B & B) Algorithm – Zero – One Implicit Enumeration Algorithm –Cutting Plane Algorithm. **(18 hours)**

Unit 2: Deterministic Dynamic Programming: Recursive Nature Of Computations In DP – Forward And Backward Recursion – Selected DP Applications Cargo – Loading Model – Work Force Size Model –Equipment Replacement Model–Investment Model–Inventory Models. **(18 hours)**

Unit 3: Probabilistic Inventory Models: Continuous Review Models - Probabilitized EOQ Model- Probabilistic EOQ Model – Single Period Models- No-Setup Model (Newsvendor Model)- Setup Policy (S-S Policy)- Multiperiod Model. **(18 hours)**

Unit 4: Classical Optimization Theory: Unconstrained Extremal Problems – Necessary And Sufficient Conditions – Newton - Raphson Method – Constrained Problems – Equality Constraints – Inequality Constraints- Karush –Kuhn-Tucker Conditions (KKT). **(18 hours)**

Unit 5: Nonlinear Programming Algorithms: Unconstrained Nonlinear Algorithms – Direct Search Method – Gradient Method – Constrained Nonlinear Algorithms – Separable Programming – Quadratic Programming **(18 hours)**

Book for Study:
Taha H.A., "Operations Research – An Introduction", IX Edition, Pearson Education Inc,2011
Unit :1 Chapter 9 Sections 9.1,9.2
Unit :2 Chapter 12 Sections 12.1-12.4
Unit :3 Chapter 16 Sections 16.1-16.3
Unit :4 Chapter 20 Sections 20.1, 20.2
Unit :5 Chapter 21 Sections 21.1,21.2

Books for Reference:
1. Kantiswaroop, P.K.Gupta and Manmohan, "Operations Research", Sultan Chand & Sons, New Delhi,15th edition, reprinted 2011.
2. Sharma., "Operations Research", 2nd Edition, Vikas Publishing House Private Limited, New Delhi, 2002.

Teaching Learning Methods:
• Lecture Method, ICT, Assignment, Quiz, 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 optimal solutions for Integer Linear Programming problems using algorithmic approaches	K3
CO2	Determine solutions for real life applications applying Dynamic Programming approach	K3
CO3	Calculate optimal order quantity of probabilistic inventory models	K4
CO4	Solve the problems using classical optimization theory	K3
CO5	Apply various methods to solve for non linear programming 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	2	2	2	2				3	3	3	2	2	24
CO2	3	2	2	2	2				3	3	3	2	2	24
CO3	3	2	2	2	2				3	3	3	2	2	24
CO4	3	2	2	2	2				3	3	3	2	2	24
CO5	3	2	2	2	2				3	3	3	2	2	24
Grand Total of Cos with POs & PSOs														120
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{120}{50}$														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 Operations Research are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
MATHEMATICAL MODELING
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II M.Sc. Mathematics	**Part**	: Core Elective – 3a
Semester	: III	**Hours**	: 90
Course Code	: 22PMAE33	**Credits**	: 4

Objective:
This course enables the students to connect the real world with mathematics and find mathematical solution for real life problems.

Course Content:

Unit 1: Modeling Change: Modeling change with difference equations- approximating change with difference equations – solutions to dynamical systems- systems of difference equations.
(18 hours)

Unit 2: The Modeling Process, Proportionality and Geometric Similarity: Mathematical models – modeling using proportionality – modeling using geometric similarity – automobile gasoline mileage- body weight & height, strength & agility.
(18 hours)

Unit 3: Discrete Probabilistic Modeling: Probabilistic modeling with discrete systems- modeling component and system reliability- linear regression.
(18 hours)

Unit 4: Optimization of Discrete Models: An overview of optimization modeling – linear programming - geometric solutions – algebraic solutions – simplex method.
(18 hours)

Unit 5: Modeling with a Differential Equation: Population growth- prescribing drug dosage- braking distance revisited- graphical solutions of autonomous differential equations- numerical approximation methods- separation of variables.
(18 hours)

Book for study: Frank R. Giordano, William P. Fox, Steven B. Horton "A First Course in Mathematical Modeling", Cengage Learning.

Unit 1:   Chapter 1   Section 1.1 to 1.4
Unit 2:   Chapter 2   Section 2.1 to 2.5
Unit 3:   Chapter 6   Section 6.1 to 6.3
Unit 4:   Chapter 7   Section 7.1 to 7.4
Unit 5:   Chapter 11   Section 11.1, 11.4-11.7

Books for References:
1. Principles of Mathematical Modeling (Ideas, Methods, Examples) A.A. Samarskii, A.P. Mikhailov © 2002 by Taylor & Francis Group, LLC
2. Mathematical modelling- Applications with GeoGebra., Jonas Hall and Thomas Lingefjärd @ 2017 by John Wiley & Sons.

Teaching Learning Methods:
- Lecture Method, ICT, Assignment, Quiz, 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	Examine the implications of difference equations in model formulation	K4
CO2	Analyze the mathematical models framed using statistical methods	K4
CO3	Infer the applications of probabilistic modeling to discrete systems	K4
CO4	Illustrate the applications of mathematical models using Linear programming problems.	K4
CO5	Interpret the intervention of differential equations in mathematical modeling.	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	3	2	3	26
CO2	3	3	2	2	2				3	3	3	2	3	26
CO3	3	3	2	2	2				3	3	3	2	3	26
CO4	3	3	2	2	2				3	3	3	2	3	26
CO5	3	3	2	2	2				3	3	3	2	3	26
Grand Total of Cos with POs & PSOs														130
Mean Value of Cos with POs & PSOs = $\frac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \frac{130}{50}$														2.6

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			2.6
Observation	Cos of Mathematical Modelling are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
CALCULUS OF VARIATIONS
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II M.Sc. Mathematics	**Part**	: Core Elective – 3b
Semester	: III	**Hours**	: 90
Course Code	: 22PMAE33	**Credits**	: 4

Objective:
This course enable the students comprehend and apply the techniques of solving different types of differential equations.

Course Content:

Unit 1: The concept of variation and its properties : Euler's equation - variational properties for functional - functionals dependent on higher order derivatives - functions of several independent variables - some applications to problems of mechanics.   **(18 hours)**

Unit 2: Movable boundary for a functional dependent on two functions : one sided variations – reflection and refraction of extremals - diffraction of light rays.
(18 hours)

Unit 3: Regularity conditions : - special kinds of kernals - Eigen values and Eigen functions - convolution integral - reduction to a system of algebraic equations – Fredholm alternative - an approximation method.
(18 hours)

Unit 4: Method of successive approximations :iterative scheme - Volterra integral equations - some results about the resolvent kernel - the method of solution of Fredholm equation - Fredholm first theorem
(18 hours)

Unit 5: Integral equations : Initial value problems - boundary value problem -singular integral equations – the Abel integral equations.
(18 hours)

Book for study:
    01. A. S. Gupta, Calculus of Variations with Applications, PHI, New Delhi, 2005.
Unit I :   Chapter - 1   Sections 1.1 - 1.7
Unit II :   Chapter - 2   Sections 2.1 - 2.5
    02. Ram P. Kanwal, Linear Integral Equations, Theory and Techniques, Academic Press, New York, 1971.
Unit III :   Chapter - 1   Sections 1.1 - 1.5
                 Chapter - 2   Sections 2.1 - 2.5
 Unit IV   Chapter - 3   Sections 3.1 - 3.5
                  Chapter - 4   Sections 4.1 - 4.3
Unit V :   Chapter - 5   Sections 5.1 - 5.3
                  Chapter - 8   Sections 8.1 - 8.2

Books for References:

Pars, Leopold Alexander. *An introduction to the calculus of variations*. Courier Corporation, 2013.

Teaching Learning Methods:

● Lecture Method, ICT, Assignment, Quiz, 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 vibrational properties to solve higher order differential equations	**K3**
CO2	Solve problems based on reflection and refraction of extremals	**K3**
CO3	Use methods based on Eigen values to find solutions to the problems	**K3**
CO4	Employ iterative methods to find solutions to the given problems	**K3**
CO5	Obtain and analyse the solutions to initial and boundary value problems using different methods	**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	3	2	3	26
CO2	3	3	2	2	2				3	3	3	2	3	26
CO3	3	3	2	2	2				3	3	3	2	3	26
CO4	3	3	2	2	2				3	3	3	2	3	26
CO5	3	3	2	2	2				3	3	3	2	3	26
Grand Total of Cos with POs & PSOs														130
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{130}{50}$														2.6

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			2.6
Observation	**Cos of Calculus of Variation are strongly correlated with POs & PSOs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
Functional Analysis
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	**: II M.Sc. Mathematics**	**Part**	**: Core - 12**
Semester	**: IV**	**Hours**	**: 90**
Course Code	**: 22PMAD24**	**Credits**	**: 5**

Objective:

This course enables the learners to comprehend and analyze the associations between algebraic and topological structures.

Course Content:

Unit 1:   **Algebraic systems :** Linear spaces – dimension of a linear space – linear transformations – algebras   **(18 hours)**

Unit 2:   **Banach spaces :** Continuous linear transformations – Hahn – Banach theorem – natural imbedding of N in N** – open mapping theorem – conjugate of an operator

(18 hours)

Unit 3:   **Hilbert spaces :** Orthogonal complements – orthogonal sets – Bessel's inequality – conjugate space H*   **(18 hours)**

Unit 4:   **Theory of operators :** Adjoint of an operator – self adjoint operators – normal and unitary operators – projections   **(18 hours)**

Unit 5:   **Finite dimensional spectral theory :** Matrices – determinants – spectrum of an operator – spectral theorem – general preliminaries on Banach algebras – regular and singular elements   **(18 hours)**

Book for Study:

Simmons, G. F., *Introduction to Topology and Modern Analysis*, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 2006.

Unit 1 :	Chapter 8	Sections 42 - 45
Unit 2 :	Chapter 9	Sections 46 - 51
Unit 3 :	Chapter 10	Sections 52 - 55
Unit 4 :	Chapter 10	Sections 56 - 59
Unit 5 :	Chapter 11	Sections 60 - 63
	Chapter 12	Sections 64 - 65

Books for Reference:

1. Walter Rudin, *Functional Analysis*, Tata McGraw-Hill publishing Co. Ltd., New Delhi, 2006.

2. Casper Goffman and George Pedrick, *First Course in Functional Analysis*, Prentice Hall of India Private Ltd., 1987.

Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, 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 their knowledge on linear spaces and linear transformations	**K3**
CO2	Examine the theoretical justifications in Hahn-Banach and Open Mapping theorems and deduce a few applications	**K4**
CO3	Infer the geometrical properties of orthogonality in Hilbert Spaces	**K3**
CO4	Classify various operators on Hilbert Spaces	**K3**
CO5	Illustrate the concepts and implications of finite dimensional spectral theory	**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	20
CO2	3	3			2				3	3	3	2	3	22
CO3	3	3			2				3	3	3	2	3	22
CO4	3	3			2				3	3	3	2	3	22
CO5	3	3			2				2	3	3	2	3	21
Grand Total of Cos with POs & PSOs														107
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{107}{40}$														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 & PSOs			2.7
Observation	Cos of Functional Analysis are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
Fuzzy Sets and Applications
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II M.Sc. Mathematics	**Part**	: Core - 13
Semester	: IV	**Hours**	: 90
Course Code	: 22PMAD34	**Credits**	: 5

Objectives :

This course enables the learners to gain more insights on the theoretical conceptualization of fuzzy sets and its applications

Course outline:

Unit 1: **Classical Sets to Fuzzy Sets & Fuzzy Sets versus Crisp Sets** : Overview of crisp sets – Fuzzy sets- types- basic concepts – additional properties of α-cuts - representation of fuzzy sets– decomposition theorems of fuzzy sets-extension principle for fuzzy sets.

(18 hours)

Unit 2: **Operation on Fuzzy Sets**: Types of operations – fuzzy compliments –First, Second Characterization theorem of fuzzy complements - fuzzy intersections: t-norms – fuzzy union: t-co norms - combination of operations. **(18 hours)**

Unit 3: **Fuzzy Arithmetic & Fuzzy Relations**: Fuzzy number – linguistic variables – arithmetic operation on intervals – arithmetic operations on fuzzy numbers – binary fuzzy relation-fuzzy equivalence relation-fuzzy compatibility relation-fuzzy ordering relation

(18 hours)

Unit 4: **Constructing Fuzzy Sets and Operations on Fuzzy Sets** : Overview of methods of constructing fuzzy sets- direct methods with one expert-direct methods with multiple experts-indirect method with one expert-indirect methods with multiple experts

(18 hours)

Unit 5: **Fuzzy Decision Making** : Individual Decision Making - Multi person Decision Making - Multi Criteria Decision Making – Multi Stage Decision Making – Fuzzy Ranking Methods.

(18 hours)

Book for Study :

01. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic Theory and Applications", PHI Learning Private Limited, New Delhi, 2016.

Unit 1 :	Chapter 1	Sections 1.1 – 1.5
	Chapter 2	Sections 2.1 – 2.3
Unit 2 :	Chapter 3	Sections 3.1 – 3.5
Unit 3 :	Chapter 4	Sections 4.1 – 4.5
	Chapter 5	Sections 5.3 – 5.7
Unit 4 :	Chapter 10	Sections 10.1 – 10.6
Unit 5 :	Chapter 15	Sections 15.1 – 15.6

Books for Reference:

01. Zimmermann, "Fuzzy set theory and its applications" Affiliated East West Press Pvt Ltd, 2nd Edition, 1996.
02. George J.Klir and Tina A.Folger, "Fuzzy sets, Uncertainty and information" PHI Learning Pvt limited, New Delhi, 2009.

Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, 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 fuzzy set and its properties	K2
CO2	Apply various operations on fuzzy sets and make interpretations	K3
CO3	Correlate fuzzy and crisp approaches in different kinds of relations	K4
CO4	Differentiate the utility of direct and indirect methods in constructing fuzzy sets	K4
CO5	Make inferences on applications of fuzzy decision making models	K4

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

Mapping Course Outcomes 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	3							3	3	3	2	2	19
CO2	3	3							3	3	3	2	2	19
CO3	3	3							3	3	3	2	2	19
CO4	3	3	3	3	3				3	3	3	3	3	30
CO5	3	2	3	3	3				3	3	3	3	3	29
Grand Total of Cos with POs & PSOs														116
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ Pos\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{116}{41}$														2.83

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			2.83
Observation	Cos of Fuzzy Sets and Applications are strongly correlated with POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
Project
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	**: II M.Sc. Mathematics**	**Part**	**: Core - 14**
Semester	**: IV**	**Credits**	**: 5**
Course Code	**: 22PMAD44**		

Objective

This course intends to make the learners acquire intense knowledge on the nuances of research and facilitates them to apply the mathematical concepts to design solutions to social problems

Course Outline:

The students undertake the project during the IV semester after the preliminary steps of student allotment to staff and topic selection in the III semester.

The students must attend atleast one conference/seminar at international/national/state level and it is made mandatory for internal assessment.

The student's progress is periodically assessed by the project guide through tests and presentation.

The significant research work is encouraged for presentations and publications in conferences and journals

Evaluation:

Internal – 50 Marks
Certificate of Participation / Presentation in conferences / seminars at international / national / state level – 10 Marks
Internal Viva-Voce- 15 Marks
Dissertation – 25 Marks

External Viva-Voce – 50 Marks

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	Gain new insights and apply in the respective field of study	K3
CO2	Illustrate the concept of lab to land in the project	K3
CO3	Develop and apply the nuances of documentation of the works based on mathematical conceptualizations and implications	K3
CO4	Appraise and appreciate mathematical interventions in real life scenario	K4
CO5	Design innovative projects with the application of mathematical concepts towards scientific and societal development	K6

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		2		3	3	2	3	3	28
CO2	3	2	3	3	3		2		3	3	3	3	3	31
CO3			2	2	2		2					3	2	13
CO4	3	2	3	3	3		2		3	3	3	3	3	31
CO5	3	2	3	2	3		2		3	3	3	3	3	30
Grand Total of Cos with POs & PSOs														133
Mean Value of Cos with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{133}{50}$														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 & PSOs			2.7
Observation	Cos of Project are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
Automata Theory
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II M.Sc. Mathematics	**Part**	: Core Elective - 4a
Semester	: IV	**Hours : 90**	
Course Code	: 22PMAE44	**Credits: 4**	

Objective:

This course enables the learners to comprehend, apply and analyze the conceptualization and the characteristics of finite automata

Course Content:

Unit 1 : **Finite Automata and Regular expressions**: Definitions and examples - Deterministic and Nondeterministic finite Automata- Finite Automata with moves - Regular expressions and their relationship with automation.

(18 hours)

Unit 2 : **Context free grammar**s: Derivation trees –Simplification of Context free grammas - Chomsky Normal form – Greibach normal form. **(18 hours)**

Unit 3 : **Pushdown Automata:** Definition and examples - Relation with Context free languages. **(18 hours)**

Unit 4 : **Finite Automata and lexical analysis**- Role of a lexical analyzer - Minimizing thenumber of states of a DFA -Implementation of a lexical analyzer.

(18 hours)

Unit 5 : **Basic parsing techniques**- Parsers - Bottom up Parsers - Shift reduce - operatorprecedence - Top down Parsers - Recursive descent - Predictive parsers.

(18 hours)

Books for Study:

1. John E. Hopcroft and Jeffrey D. Ullman, *Introduction to Automata theory, Languages and Computations*, Narosa Publishing House, Chennai, 2000.

Unit 1 :	Chapter 2	Sections 2.1 – 2.5
Unit 2 :	Chapter 4	Sections 4.1 – 4.6
Unit 3 :	Chapter 5	Sections 5.2, 5.3

2. A.V. Aho and Jeffrey D. Ullman, *Principles of Compiler Design*, Narosa Publishing House, Chennai, 2002.

Unit 4 :	Chapter 3	Sections 3.1 – 3.8
Unit 5 :	Chapter 5	Sections 5.1 – 5.5

Books for Reference:

1. Harry R. Lewis and Christos H. Papadimitriou, Elements of the Theory of Computation, Second Edition, Prentice Hall, 1997.

2. A.V. Aho, Monica S. Lam, R. Sethi, J.D. Ullman, Compilers: Principles, Techniques, and Tools, Second Edition, Addison-Wesley, 2007.

Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, 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 finite automata and its kinds	K3
CO2	Compare various kinds of grammars andits implications	K4
CO3	Establish automation in relation with context free languages	K3
CO4	Analyze the role of lexical analyzer	K4
CO5	Apply the parsing techniques in generating Strings	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							3	2	3	2	2	17
CO2	3	3							3	2	3	2	2	18
CO3	3	2							3	2	3	2	2	17
CO4	3	2							3	2	3	2	2	17
CO5	3	3							3	2	3	2	2	18
Grand Total of COs with POs & PSOs														87
Mean Value of COs with POs & PSOs = $\frac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \frac{87}{35}$														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 Automata Theory are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS
Fluid Dynamics
(For those who joined in 2022 onwards or later under new CBCS – OBE pattern)

Class	: II M.Sc. Mathematics	**Part: Core Elective – 4b**	
Semester	: IV	**Hours : 90**	
Course Code	: 22PMAE44	**Credits: 4**	

Objective:

> This course enables the learners comprehend and analyze the characteristics of fluids motion with mathematical theories and implications.

Course Content:

Unit 1 : **Real fluids and ideal fluids** – velocity of a fluid at a point – streamlines and path lines steady and unsteady flows – velocity potential – vorticity vector – local and particle rates of change – equation of continuity – worked examples – acceleration of a fluid – conditions at a rigid boundary – general analysis of fluid motion

(18 hours)

Unit 2 : **Pressure at a point in a fluid at rest** – pressure at a point in a moving fluid – conditions at a boundary of two inviscid immiscible fluids – Euler's equations of motion – Bernoulli's equation – worked examples – discussion of the case of steady motion under conservative body forces – some flows involving axial symmetry – some special two–dimensional flows – some further aspects of vortex motion **(18 hours)**

Unit 3 : **Sinks and Doublets:** Introduction – sources – axis symmetric flows – Stoke's stream function – some special forms of the stream function for axis – symmetric irrotational motions **(18 hours)**

Unit 4 : **Two–dimensional flow:** – use of cylindrical polar co–ordinates – stream function – complex potential for two–dimensional – irrotational – incompressible flow – complex velocity potential for standard two–dimensional flow: uniform stream – line sources and line sinks – line doublets – line vortices – some worked examples – Milne–Thomson circle theorem – some applications of the circle theorem – extension of the circle theorem – theorem of Blasius

(18 hours)

Unit 5 :   **Stress components in a real fluid**: relations between Cartesian components of stress – translational motion of fluid element – the rate of strain quadric and principal stress   **(18 hours)**

Books for Study:

Chorlton F., Textbook of Fluid Dynamics, New Delhi: CBS Publishers and Distributors. Print. 2004

Unit 1 :   Chapter 1
Unit 2 :   Chapter 2
Unit 3 :   Chapter 3
Unit 4 :   Chapter 4
Unit 5 :   Chapter 5

Books for Reference:

- Goyal and Gupta, Fluid Dynamics, Pragati Prakashan Educational Publishers. Print. 2016.
- Bansal J.L, Viscous Fluid Dynamics, Delhi:Oxford & IBH Publishers.Print. 1996

Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, 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 general analysis of fluid motion	K2
CO2	Apply Bernoulli's and Euler's equation of motion to make inferences on the fluid motion	K3
CO3	Use Stoke's stream function in determining the fluid motion	K3
CO4	Make inferences on two dimension flow of the fluid using Milne–Thomson circle theorem & theorem of Blasius	K3
CO5	Compares the Cartesian components of stress and different types of motion	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	2							3	2	3	2	2	17
CO2	3	3							3	2	3	2	2	18
CO3	3	2							3	2	3	2	2	17
CO4	3	2							3	2	3	2	2	17
CO5	3	3							3	2	3	2	2	18
Grand Total of COs with POs & PSOs														87
Mean Value of COs with POs & PSOs = $\frac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \frac{87}{35}$														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 Fluid Dynamics are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF MATHEMATICS

QUESTION PAPER PATTERN (PG)
(Core, Core Elective and Non-Major Elective)
(For those who join from 2022 onwards)

INTERNAL (40 MARKS)

SECTION – A (8 x 1 = 8)

EIGHT multiple choice questions. Each question carries 1 mark. (K1, K2)

SECTION – B (4 x 8 = 32)

FOUR questions with internal choice. Each question carries 8 marks. (K3, K4, K5)

EXTERNAL (100 MARKS)

SECTION – A (10 x 1 = 10 marks)
TEN multiple choice questions. Each question carries one mark. (K1, K2)

SECTION – B (5 x 6= 30 marks)
FIVE questions with internal choice. Each question carries six marks. (K3, K4)

SECTION – C (5 x 12 = 60 marks)
FIVE questions with internal choice. Each question carries twelve marks. (K3, K4,K5)

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF MATHEMATICS

SCHEME OF EVALUATION (PG)

1. Continuous Internal Assessment

	Marks
Test – 1	40
Test – 2	40
Assignment / Seminar	20

Total	100
	------

2. Semester Examination   100 Marks

3. Total Marks = 50% C.I.A + 50% Semester Examinations

A candidate must score a minimum of 23 marks out of 50 in the semester examination and an overall aggregate minimum of 50 marks out of 100 for a pass.

DEPARTMENT OF PHYSICS

ARUL ANANDAR COLLEGE *(Autonomous)*, KARUMATHUR
DEPARTMENT OF PHYSICS
B.Sc. Physics - CBCS Syllabus (2022-2023 Onwards)

PART	SUB. CODE	PAPER	HRS	CR
I SEMESTER				
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	**CORE** Mechanics & Properties of Matter Physics Lab – I	6 3	5 --
	22UMAB11	**ALLIED -1** 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
II SEMESTER				
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	**CORE** Electricity & Electromagnetism Physics Lab – I	6 3	5 3
	22UMAB22	**ALLIED -2** 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
Total			**30**	**25**

III SEMESTER				
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		**CORE**		
	22UPYC33	Basic Electronics	6	6
	22UPYP24	Physics Lab – II	3	---
	22UPYB33	**Allied Physics-1 (For Chemistry)**	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		
Total			**30**	**20**

IV SEMESTER				
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		**CORE**		
	22UPYC44	Heat and Thermodynamics	6	6
	22UPYP24	Physics Lab – II	3	3
	22UPYB44	**Allied Physics-2 (For Chemistry)**	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
Total			**30**	**27**

<table>
<tr><td colspan="5" align="center">V SEMESTER</td></tr>
<tr><td></td><td></td><td>CORE</td><td></td><td></td></tr>
<tr><td rowspan="7">III</td><td>22UPYC65</td><td>Modern Physics</td><td>5</td><td>5</td></tr>
<tr><td>22UPYC75</td><td>Optics & Spectroscopy</td><td>5</td><td>5</td></tr>
<tr><td>22UPYC85</td><td>Mathematical Physics</td><td>5</td><td>5</td></tr>
<tr><td>22UPYC95</td><td>Digital Electronics</td><td>4</td><td>4</td></tr>
<tr><td>22UPYP36</td><td>Physics Lab – III</td><td>3</td><td>--</td></tr>
<tr><td>22UPYP46</td><td>Physics Lab – IV</td><td>3</td><td>--</td></tr>
<tr><td></td><td>CORE ELECTIVE</td><td></td><td></td></tr>
<tr><td></td><td>22UPYE15</td><td>Astrophysics / Information Technology</td><td>3</td><td>2</td></tr>
<tr><td rowspan="2">IV</td><td>22UINT15</td><td>Internship</td><td>-</td><td>1</td></tr>
<tr><td>22USSI16</td><td>Soft Skill</td><td>2</td><td>--</td></tr>
<tr><td>Total</td><td></td><td></td><td>30</td><td>22</td></tr>
</table>

<table>
<tr><td colspan="5" align="center">VI SEMESTER</td></tr>
<tr><td></td><td></td><td>CORE</td><td></td><td></td></tr>
<tr><td rowspan="8">III</td><td>22UPYD06</td><td>Classical, Statistical and Relativistic Mechanics</td><td>5</td><td>5</td></tr>
<tr><td>22UPYD16</td><td>Nuclear Physics</td><td>5</td><td>5</td></tr>
<tr><td>22UPYD26</td><td>Solid state Physics</td><td>5</td><td>5</td></tr>
<tr><td>22UPYD36</td><td>Nanophysics</td><td>4</td><td>4</td></tr>
<tr><td>22UPYP36</td><td>Physics Lab – III</td><td>3</td><td>3</td></tr>
<tr><td>22UPYP46</td><td>Physics Lab – IV</td><td>3</td><td>3</td></tr>
<tr><td></td><td>CORE ELECTIVE</td><td></td><td></td></tr>
<tr><td>22UPYE26</td><td>Basic Electric Principles & Applications/ Medical Physics / Optoelectronics</td><td>3</td><td>2</td></tr>
<tr><td>IV</td><td>22USSI16</td><td>Soft Skills</td><td>2</td><td>2</td></tr>
<tr><td>Total</td><td></td><td></td><td>30</td><td>29</td></tr>
</table>

SEMESTER	I	II	III	IV	V	VI	TOTAL
CREDITS	**21**	**25**	**20**	**27**	**22**	**29**	**144**

PART	CREDITS
Part -I	16
Part -II	16
Total	**32**
Part -III	
Core	72
Allied	16
Core Electives	04
Internship	01
Total	**93**
Part -IV	
Non - Major Elective	04
Skill Based Elective	04
Value Education	04
Communication Skill	01
Soft Skill	02
Total	**15**
Part -V	02
Bridge Course & ARISE	02
TOTAL	**144**

Elective for **ARTS** students   : Popular Physics (III Sem.)

Elective for **OTHER SCIENCE** Students   : Basics of Applied Physics (IV Sem.)

SELF LEARNING COURSES			
Semester	**Sub.Code**	**Paper**	**Credits**
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

Class : B.Sc. Physics	Part : III Core-3
Semester : III	Hours : 90
Subject Code : 22UPYC33	Credits: 6

BASIC ELECTRONICS
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:
➢ To acquire the basic concepts of various network theorems, clipper/clamper and filter circuits, amplifier and oscillator circuits.
➢ To obtain the knowledge of BJT, FET, UJT, OP-Amp and optoelectronic devices.

Unit 1 Network Analysis **(18 hrs)**
Superposition Theorem - Voltage source and Current Source - Thevenin's Theorem - Norton's Theorem - Maximum Power Transfer Theorem - h parameters - h parameters of an ideal CE transistor

Unit 2 Solid State Devices - I **(18 hrs)**
Ideal diode - Clipping and Clamping Circuits - Positive and Negative clipping - Positive and Negative clamping - Zener Diode - Characteristics -Zener Diode as Voltage Regulator - Full-Wave Bridge Rectifier - Filter Circuits - Shunt Capacitor Filter - Voltage Multiplier - Doubler - Tripler

Unit 3 Solid State Devices - II **(18 hrs)**
DC Load Line - Quiescent Point - Stability factor - Methods of biasing -Emitter Feed Back Bias - Universal Divider Bias. FET - Working Principles of JFET - Output Characteristics of JFET - Working Principles of UJT -Application of UJT as an oscillator-SCR -Working Principles

Unit 4 Amplifiers and Oscillators **(18 hrs)**
Amplifiers - Common Base and Common Collector - Amplifiers (Basics only) Common Emitter Type - Voltage Gain - Frequency Response -Amplifier Classification based on biasing condition - Push Pull Amplifier.
Oscillators - Feedback Principle - Types of Feedback - Advantage of Negative Feed Back - Barkhausen Criterion - Hartley, Colpitt and Phase Shift Oscillators - Multivibrators - Astable - Monostable - Bi-stable Multivibrators

Unit 5 Optoelectronics and Operational Amplifiers **(18 hrs)**
Optoelectronics - LED - Photovoltaic Devices - Photo Diodes
OP-AMP - Characteristics - Non Inverting Amplifier - Inverting Amplifier -Expressions for Gain - Concept of Virtual Ground - Applications as Adder, Subtractor, Differentiator, Integrator and Comparator.

Text Book:
1. Theraja. B.L, 2012, Basic Electronics, S.Chand and Co., New Delhi.
   Unit I - Ch 4.2- 4.9, 21.14, 21.18.
   Unit II - Ch.14.4, 14.13-14.17, 15.1-15.2, 17.8, 17.9, 17.11, 17.24-17.27.
   Unit III - Ch.20.1, 20.2, 20.3, 20.5, 20.8, 20.10, 20.13, 26.1-26.6, 27.1-27.4.
   Unit IV - Ch.22.2, 22.4, 22.5, 22.6, 22.7 23.9.22.13, 22.24, 25.1-25.3, 28.1-28.14.28.21, 28.22, 29.6-29.10.
   Unit V – Ch.16.1- 16.3, 16.6 - 16.11, 31.18-31.3.

References:
1. Mehta, V.K & Rohit Mehta, 2020, Principles of Electronics, 12th ed., S.Chand and Co., New Delhi.
2. Millman and Halkias, 2017, Electronics Fundamentals and Applications, 2nd ed., McGraw Hill, New Delhi.
3. Albert Malvino& David J. Bates, 2017, Electronic Principles, 7th ed., McGraw Hill.
4. Grob & Schultz, 2003, Basic Electronics, 9th ed., Tata McGraw Hill.

Course outcomes

On completion of the course, the students will be able to

CO 1: Understand the complex circuits via various network theorems.

CO 2: Apply the basics of diode to describe the working of rectifier circuits such as Full and half wave rectifiers.

CO 3: Illustrate the principles and working of semiconductor devices.

CO 4: Classify the amplifier circuits and oscillator principles and its types.

CO 5: Discuss ideal operational amplifier (op amp) and design different application circuits using op amp.

Mapping of Cos with PSOs &Pos:

SEMESTER II	Subject Code: 22UPYC33								Title of Paper: Basic 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	3		3	3	3			3	3	3	3	3	30
CO2	2	3		3	3	3			3	3	2	3	3	28
CO3	3	3		3	3	3			3	2	3	3	3	29
CO4	2	3		3	3	3			3	3	3	3	3	29
CO5	3	3		3	2	3	1		3	3	3	3	2	29
Grand total of COs with PSOs and POs														145
Mean value of COs with PSOs and POs=$\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}=\left(\frac{145}{51}\right)$														2.84

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			2.84
Observation	**COs of Basic Electronics Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: B.Sc. Chemistry	**Part**	: III Allied-1
Semester	: III	**Hours**	: 45
Subject Code	: 22UPYB33	**Credits**	: 3

ALLIED PHYSICS – I (For Chemistry students)
MECHANICS, PROPERTIES OF MATTER, THERMAL PHYSICS and OPTICS
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:
➢ To explain the wave nature & properties of elastic bodies with experiments.
➢ To understand basic concepts of thermodynamics and various properties of light.

Unit 1: Waves and Oscillations (9 hrs)
Simple harmonic motion - transverse vibrations of strings - Melde's string - transverse and longitudinal modes - ultrasonic's - production - application and uses - reverberation - factors for good acoustics of hall and auditorium.

Unit 2: Properties of Matter (9 hrs)
Elasticity - different moduli of elasticity - poisson's ratio - energy stored in a stretched wire - bending of beam -Young's modulus by uniform and non - uniform bending - torsion pendulum - determination of rigidity modulus by torsional pendulum. Viscosity: Streamline flow and turbulent flow - Coefficient of viscosity.

Unit 3: Thermal Physics (9 hrs)
Postulates of the kinetic theory of gases – Van der waals equation of states -Joule - Kelvin effect - porous plug experiment. Laws of thermodynamics - heat engine - entropy - change of entropy in reversible and irreversible processes.

Unit 4: Geometrical Optics (9 hrs)
Refraction- Refraction through a thin prism – dispersion through a prism- expression for the dispersive power of material of a thin prism - combination of two prisms to produce dispersion without deviation - direct vision spectroscope - defects of images-coma- - spherical aberration in lens – methods of minimizing spherical aberration - chromatic aberration in lens - removal of chromatic aberration.

Unit 5: Physical Optics (9 hrs)
 Interference – Interference in thin films - air wedge - determination of diameter of a thin wire by air wedge - Diffraction - theory of transmission grating- Normal incidence - polarization- double refraction- Nicol prism.

Text Book:
1. R. Murugesan Allied Physics, First Edition (2016), S. Chand and Co., New Delhi-110005.
    Unit I   - Ch. 1.1,1.5-1.7,1.9,1.11-1.18.
    Unit II   - Ch. 2.1-2.8, 2.12-2.15.
    Unit III   - Ch. 3.1-3.2, 3.4-3.6, 3.15-3.22.
    Unit IV   - Ch. 5.1, 5.10-5.14, 5.16, 5.18-5.19, 5.22, 5.25.
    Unit V   - Ch. 6.2- 6.5, 6.8, 6.10 - 6.14, 6.16.

Books for Reference:

1. Brij Lal and N Subramanyan, 2002, Properties of Matter, First Edition, S Chand Publication, New Delhi.
2. D S Mathur, 2010, Elements of Properties of Matter, First Edition, S Chand & Company, New Delhi.

Course outcomes

On completion of the course, the students will be able to

CO 1: Describe the wave nature

CO 2: Explain the properties of elastic bodies with experiments.

CO 3: Characterize the basic concepts of thermodynamics.

CO 4: Interpret the change of entropy.

CO 5: Understand the dispersion of light through various medium.

CO 6: Analyze the interference and diffraction in various medium.

Mapping of COs with PSOs & POs:

SEMESTER I	Subject Code: 22UPYB33								Title of Paper: Allied Physics – I MECHANICS, PROPERTIES OF MATTER, THERMAL PHYSICS and OPTICS					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	2	2	1	1	2	1	3	1	3	21
CO2	3	2		3	3	2			3	2	3	1	3	25
CO3	3	3		2	3	2			3	2	2	2	2	24
CO4	3	2		3	3	2			3	2	2	3	2	25
CO5	3	2		2	1	3		1	2	2	3	2	3	24
Grand total of COs with PSOs and POs														119
Mean value of COs with PSOs and POs=$\frac{Grand\,total\,of\,COs\,wit\quad h\,PSOs\,and\,POs}{Number\,of\,COs\,relating\,wit\quad h\,PSOs\,and\,POs} = \left(\frac{119}{52}\right)$														2.29

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			2.29
Observation	**COs of Allied Physics – I:MECHANICS, PROPERTIES OF MATTER, THERMAL PHYSICS and OPTICS Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class : B.A., (Arts)	Part : IV NME-1
Semester : III	Hours : 45
Subject Code : 22UPYN13	Credits : 2

POPULAR PHYSICS – (elective for arts students)
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:
➢ To understand the basics of light & sound, sources of energy and communication
➢ To gain knowledge on the idea about the universe and astrophysics
➢ To acquire knowledge on the medical instruments and its uses

Unit 1 Light and Sound (9 hrs)
Nature of light – Sources of light – Properties of light – Velocity of light – Naturally occurring phenomenon of light (introductory ideas) Rainbow, Blue of sky
Nature of sound waves – Characteristics of sounds – Reverberation – Echo - Velocity of sound - SONAR - Lightning and thunder

Unit 2 Energy Physics (9 hrs)
Different forms of energy – Conventional and non-conventional energy sources – Solar energy - Wind energy – Tidal energy – Nuclear energies– Applications

Unit 3 Communication Physics (9 hrs)
Communication system – Analog and digital communication system – Process in communication system - Communication satellites – Components of a satellite – RADAR – Fibre optic communication – Advantages

Unit 4 Astro-Physics (9 hrs)
The Universe - Solar system (Sun, Planets & Satellites) – Earth – Rotation & Revolution of earth - Seasons – Standard time - Lunar eclipse – Solar eclipse.

Unit 5 Medical Physics (9 hrs)
Parts of eye - Defects of eyes – Body temperature and Blood pressure – X-Rays and its uses in medicine - Ultrasounds and its uses in medicine – Lasers and its applications in medicines

Text Books:
1. Course material, Department of Physics, Arul Anandar College, Karumathur.

References:
1. R. Murugesan, 2016, Allied Physics, First Edition, S.Chand and Co., New Delhi-110005.
2. Rai, G.D., 2005, Non-conventional sources of Energy-4th Ed., Khanna Publishers, New Delhi.
3. Jayant V. Narlikar, Fred Hoyle - Introduction to cosmology, 3rd Ed., (2002), Cambridge University Press.
4. Subir Kumar Sarkar, Optical Fibres and Fibre Optic Communication Systems, Fourth Edition (2014),S Chand & Company Pvt Ltd, New Delhi.
5. M. Arumugam, 2019 (3rd ed - Reprint), Biomedical instrumentation, Anuradha Publication.

Course Outcome

On completion of the course, students should be able to

CO 1: develop knowledge and an understanding of fundamentals of light.

CO 2: elucidate the basic principle and types of energy generation.

CO 3: understand the components of satellite and fibre optical communication.

CO 4: describe the objects in the solar system.

CO 5: identify the various instruments in medical Physics.

Mapping of Cos with PSOs &Pos:

SEMESTER I	Subject Code: 22UPYN13								Title of Paper: POPULAR 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	2		2	3	3			3	2	3	3	3	26
CO2	2	2		2	3	3			3	2	3	3	3	26
CO3	2	2		2	3	3			3	2	3	3	3	26
CO4	1	2		2	3	3			3	2	3	3	3	25
CO5	2	2		2	3	3			3	2	3	3	3	26
Grand total of COs with PSOs and POs														129
Mean value of COs with PSOs and POs= $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs} = \left(\frac{129}{50}\right)$														2.58

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			2.58
Observation	**COs of Popular Physics Strongly related with PSOs and POs**		

Class   : B.Sc. Physics   **Part**   : Self-Learning Course
Semester   : III   **Credits:3**
Subject Code : 22UPYSL3

SPACE PHYSICS
(Self-Learning Course - Offered by Department of Physics)
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:
➢ To acquire the knowledge of solar system, stars, galaxies and space technology tools in astronomy.

UNIT 1 Universe
Origin of universe - Steady state theory – Big bang theory – Hubble's law – Red shift – models of the universe (idea only) -Milkyway galaxy – structure - Types of galaxies: Spiral – Elliptical – Irregular.

UNIT 2 Stars
Birth of stars – Nuclear fusion reaction - Evolution of stars – Binary stars – White dwaft - Neutron stars - Black holes.

UNIT 3 Solar system
Sun – Earth – Moon – other planets – Solar and lunar eclipses –comparison of stars and planets - constellations.

UNIT 4 Satellites
Satellites – Natural and artificial satellites – Types and uses – Escape speed – orbital speed.

UNIT 5 Space Technology
 ISRO – Rockets - Satellite Launching vehicles – parts – types - SLV, ASLV, PSLV and GSLV.

Books for Reference
1. Mohan Sundar Rajan, Space Today, 2012, National Book Trust of India.
2. BaidyanathBasu, An Introduction to Astrophysics, 2003, PHI
3. Krishnaswamy, K.S. 1996, Astrophysics, New Age International.
4. George O.Abell, David Morrison, Sidney C. Wolf, 1995, Exploration of the universe, Harcourt College Publication.
5. Niclolas.A.Pananides and Thomas Arny, 1979, Introductory Astronomy, Addison Wesley Publ. Co.
6. Carrol and Ostlie, 2007, Introduction to Modern Astrophysics, 2nd ed., Pearson International.

Course Outcomes
On completion of the course, the students will be able to
CO 1: Acquire the knowledge of solar system, stars and space technology tools in astronomy.
CO 2: Describe the formation of stars and galaxies.
CO 3: Discuss the energy generation and properties of sun.
CO 4: Classify the different types of stars and galaxies.
CO 5: Analyse the characteristics of different satellites and tools.

Mapping of Cos with PSOs &Pos:

SEMESTER V	Subject Code: 15UPYSL3								Title of Paper: SPACE 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		2	3	2			3	3	3	2	2	26
CO2	3	3		3	3	2			3	3	3	2	3	28
CO3	2	3		3	3	2			3	2	3	2	2	25
CO4	3	3		3	3	2	1		3	3	3	2	2	28
CO5	3	3		3	3	2	1		3	1	3	2	2	26
Grand total of COs with PSOs and POs														133
Mean value of COs with PSOs and POs= $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}$ = $\left(\frac{133}{52}\right)$														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 Space Physics Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class   : B.Sc. Physics   Part   : III Core-4
Semester   : IV   Hours : 90
Subject Code : 22UPYC44   Credits: 6

HEAT AND THERMODYNAMICS
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:

➢ To provide students with a broad understanding of the behaviour of ideal and real gas
➢ To equip the learners with the conceptualization of transmission of heat, entropy and phase transition through demonstrations

Unit 1 Behaviour of Ideal and Real Gases   **(18 hrs)**
Concept of Ideal gas – Expression for the pressure exerted by a gas – Derivation of gasequation – Derivation of gas laws – Degrees of freedom – Maxwell's law of Equipartition ofenergy - Van der Waals' Equation – Estimation of Critical Constants - Critical Coefficient – Joule-Thomson Porous Plug Experiment – Relation between Boyle Temperature, Temperature of Inversion and Critical Temperature

Unit 2 Transport Phenomena in Gases   **(18 hrs)**
Molecular collisions - Mean free path – Sphere of Influence – Collision Cross-Section - Expression for mean free path – Variation of λ with Temperature and Pressure - Transport phenomena – Viscosity – Effect of Temperature on η – Effect of Pressure on η – Thermal Conductivity – Relation between η and K – Effect of temperature on K – Effect of Pressure on K – Self Diffusion – Effect of Temperature and Pressure on D – Relation between η and D

Unit 3 Radiation   **(18 hrs)**
Thermal radiation – Black Body – Stefan-Boltzmann Law – Distribution of Energy in Black Body spectrum– Wien's Displacement Law- Rayleigh Jeans Law - Planck's Radiation Law – Derivation of Stefan's law-Derivation of Newton's Law of Cooling from Stephen's Law - Experimental verification of Stefan's Law-Solar Constant – Temperature of the sun - Solar Spectrum

Unit 4 Laws of Thermodynamics   **(18 hrs)**
Thermodynamic system- Zeroth law of thermodynamics- Internal energy- First Law of Thermodynamics – The indicator diagram- Work done using an isothermal process-work done during an adiabatic process- Slopes of adiabatics and Isothermals- Carnot's ideal heat engine- Carnot's cycle-Second law of thermodynamics

Unit 5 Thermodynamical relationships II   **(18 hrs)**
Concept of Entropy- Change in Entropy - Change in Entropy in adiabatic process- Change of Entropy in reversible Cycle – Principle of increase of Entropy -Change of Entropy in an Irreversible Processes–The T-S Diagram– Physical significance of Entropy -Entropy of a Perfect Gas- Third law of thermodynamics – Nernst's heat theorem- Maxwell's Thermodynamical Relations – Thermodynamic Potentials – Relation between C_p, C_v and μ - first order phase transitions-Second order phase transitions: Ehrenfest's equations.

TEXT BOOKS:
1. Brijlal, Subramaniam, & Hemne, 2014, Heat & Thermodynamics, S. Chand & Company Ltd
   Unit – I: 1.2, 1.4, 1.8, 1.9, 1.18, 1.19, 2.8, 2.10, 2.12, 2.21, 2.25
   Unit – II: 3.1 – 3.14, 3.16, 3.17, 3.18
   Unit – III: 8.1, 8.6, 8.12-8.15, 8.17, 8.20, 8.21, 8.22, 8.26, 8.27, 8.31
   Unit – IV: 4.1, 4.2, 4.6, 4.7, 4.11-4.14, 4.23, 4.24, 4.28
   Unit – V: 5.1- 5.9, 5.15, 6.3, 6.5, 6.8, 6.18, 6.19,

REFERENCES:
1. J.K.Sharma and K.K.Sarkar, 2018, Thermodynamics and Statistical Mechanics, 2ndEd., Himalaya Publishing House, New Delhi.
2. R. Murugeshan and Kiruthiga Sivaprasath, 2013, Thermal Physics - S.Chand& Co., New Delhi.
3. Halliday, Resnick and Krane, 2002, Physics (Vol I), 5thed., John Wiley & sons.
4. Mathur, D.S., Heat and Thermodynamics –5th Ed., S.Sulthan Chand & Sons, New Delhi 2004.
5. Sears W. Francis, 1986, Thermodynamics Kinetic Theory & Statistical Thermodynamics - Addison- Narosa Publishing House, New Delhi..

COURSE OUTCOMES
On completion of the course, the students will be able to
CO1: distinguish the behaviour of ideal gas and real gas.
CO2: comprehend the various transport phenomena like viscosity, thermal conductivity and self-diffusion.
CO3: explain the concept of mode of heat transmission and their significance
CO4: apply various laws of thermodynamics to various real systems
CO5: calculate entropy and phase changes in thermodynamical processes

SEMESTER III	Subject Code: 22UPYD06								Title of Paper: HEAT AND THERMODYNAMICS			Hours 90	Credits 6
Course Outcomes (CO'S)	Programme Outcomes (PO'S)								Programme Specific Outcomes (PSO'S)				Mean score of CO'S
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	1	2	3	2	3	3	3	2	3	2.31
CO2	3	1	2	3	2	2	2	2	3	2	3	3	2	2.31
CO3	2	2	3	2	2	3	1	1	3	2	3	3	3	2.31
CO4	3	2	3	2	2	3	2	1	3	2	3	3	3	2.46
CO5	3	2	3	2	2	3	2	1	3	2	3	3	3	2.46

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: B.Sc. Chemistry	Part : III Allied-1
Semester	: IV	Hours : 45
Subject Code	: 22UPYB44	Credits: 3

ALLIED PHYSICS – II (For Chemistry students)
MODERN PHYSICS, ELECTRICITY & MAGNETISM AND ELECTRONICS
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:
➢ To describe theories of an atom, properties of a nucleus and relativity.
➢ To understand the basics of electricity and magnetism and electronics.

Unit 1: Atomic Physics (9 hrs)
Atom model - vector atom model - various quantum numbers – coupling- Pauli's exclusion principle (definition) –Magnetic dipole moment due to orbital motion of electron - spin - Stern and Gerlach experiment.

Unit 2: Nuclear Physics (9 hrs)
Nuclear model - liquid drop model - mass defect, binding energy (definition) - shell model - Nuclear fission and fusion - chain reaction – atom bomb - nuclear reactor

Unit 3: Theory of Relativity (9 hrs)
Frame of reference - Galilean transformation equations - Postulates of special theory of relativity- Lorentz transformation equations- length contraction, time dilation - mass energy equivalence.

Unit 4: Electricity & Magnetism (9 hrs)
Capacitor - energy of a charged capacitor - loss of energy due to sharing of charges – Biot-Sarvart's law – magnetic induction at a point on the axis of a circular coil- electric circuit switches and its types - fuses, circuit breaker and relay.

Unit 5: Electronics (9 hrs)
Basic Electronics: PN junction - Zener diode – characteristics - LED - Common Emitter Transistor amplifier (Principle). Digital Electronics: AND, OR, NOT, NAND, NOR gates - NAND and NOR gates - universal building blocks - De Morgan's theorem.

Text Books:
1. R Murugesan, Allied Physics, First Edition, 2016, S. Chand and Co., New Delhi.
   Unit I   - Ch. 7.1-7.4, 7.6-7.8.
   Unit II   - Ch. 8.1-8.5, 8.8-8.9, 8.11-8.14.
   Unit III - Ch. 9.1-9.4, 9.6-9.9.
   Unit IV   - Ch. 4.1-4.3, 4.5-4.6, 4.16-4.20.
   Unit V   - Ch. 10.1-10.3, 10.5, 10.11-10.18, 10.21.

Books for Reference:
1. Brij Lal & N Subramanian, Properties of Matter, First edition (2002), S Chand Publication, New Delhi.
2. V K Mehta, Rohit Mehta, Principles of Electronics, 12th edition (2020), S Chand Publication, New Delhi.
3. Malvino and Leach, Digital Principles and Applications, 8th edition (2014), Tata McGraw - Hill, New Delhi.

Course Outcomes

On completion of the course, the students will be able to,

CO 1: Understand the structure of atom and various quantum numbers

CO 2: Acquire knowledge on the nuclear model.

CO 3: Explain the concepts of relativity.

CO 4: Elucidate the ideas on electricity and magnetism.

CO 5: Illustrate working of semiconductor devices.

Mapping of Cos with PSOs &Pos:

SEMESTER IV	Subject Code: 22UPYB44							Title of Paper:ALLIED PHYSICS – II Modern Physics, Electricity& Magnetism and Electronics					Sum of COs with PSOs and POs
Course Outcomes (CO'S)	Programme Outcomes (PO'S)							Programme Specific Outcomes (PSO'S)					
	PO1	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	2		3	3	2		1	3	3	3	2	3	28
CO2	2	3		3	3	3			3	2	3	3	2	27
CO3	3	2		3	3	3		1	3	3	3	2	3	29
CO4	3	3		2	3	3			3	2	3	2	3	27
CO5	3	2		3	3	3			3	3	3	2	3	28
Grand total of COs with PSOs and POs														139
Mean value of COs with PSOs and POs=$\frac{Grand total of COs with PSOs and POs}{Number of COs relating with PSOs and POs} = \left(\frac{139}{52}\right)$														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 Allied Physics - II: Modern Physics, Electricity & Magnetism and Electronics Strongly related with PSOs and POs**		

Class	: B.Sc. (NME)	Part	: IV NME-2
Semester	: IV	Hours	: 45
Subject Code	: 22UPYN24	Credits	: 2

BASICS OF APPLIED PHYSICS (For other science students)
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:
➢ To integrate and relate scientific knowledge learned from the classroom with real-life situations.

Unit 1 : Heating Effects of electric current **(9 hrs)**
Joule's law of heating - Heating elements - Applications of heating effect of current: Incandescent lamps - electric iron - water heater- electric kettle – Electric Fuse

Unit 2 : Communication Physics **(9 hrs)**
Types of Communication – Satellite Communication – RADAR – Optical fiber communication.

Unit 3 : LASER Physics **(9 hrs)**
Characteristics of LASER – Principle of Spontaneous and Stimulated Emission – Population Inversion – Optical Pumping - Applications.

Unit 4 : Medical Physics **(9 hrs)**
Defects of vision in Eyes – Body temperature and Blood Pressure – Ultrasonography – X-Ray – MRI – ECG – Endoscope – Bloodless Surgery.

Unit 5 : Astrophysics **(9 hrs)**
Universe – Our Solar system: The Sun, Planets and Natural Satellites – Seasons: Meteorological Seasons and Astronomical Seasons – Eclipses: Lunar and Solar Eclipses

TEXT BOOKS:
1. Course Material prepared by PG & Research Department of Physics, Arul Anandar College (Autonomous), Karumathur.

REFERENCES:
1. Murugeshan and R. Kiruthiga Sivaprakash, 2014, Optics and Spectroscopy, S.Chand & Publ.
2. Alexis Leon and Mathews Leon, 1999, Fundamentals of Information Technology, Vikas Publishing house/UBS Publishers distributors Ltd.
3. Noakes GR, 2000, Fundamentals of Physics, 1st Ed., Macmillan Publishers.
4. John R. Cameron and James G.Skofronick, 2000, Medical Physics, John Wiley & Sons.
5. A. Shanmugaraju, Introduction to Astrophysics, 2010, Shanlax Publications, Madurai.

Course outcome
On completion of the course, students should be able to
CO 1: Apply the heating effects of current in real-time applications.
CO 2: Classify various types of communication and recognize their role in various fields.
CO 3: Understand the significance of LASER and its applications.
CO 4: Comprehend the functions of various diagnosing instruments in the medical field.

CO 5: Recognize and understand the knowledge of the physical universe, various celestial objects and astronomical phenomena.

SEMESTER IV	Subject Code: 22UPYN24								Title of Paper: BASICS OF APPLIED 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		2	3	2			3	3	3	2	2	26
CO2	3	2		2	3	2			3	2	2	3	2	24
CO3	3	3		3	3	3			3	3	3	3	2	29
CO4	3	3		3	3	3			3	3	3	2	2	28
CO5	3	3		3	3	3			3	3	3	3	2	29
Grand total of COs with PSOs and POs														136
Mean value of COs with PSOs and POs=Grand total of COs with PSOs and Pos Number of COs relating with PSOs and POs=13650														2.72

Strong – 3, Medium – 2, & Low – 1

Mapping of Cos with PSOs &Pos:

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			2.72
Observation	**COs of Basics of Applied Physics Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: B.Sc. Physics	Part	: III Lab-2
Semester	: III & IV	Hours	: 90
Subject Code	: 22UPYP24	Credits	: 6

PHYSICS LAB – II
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives

➢ To determine the magnetic properties M and B_H using Tan A and Tan B positions.
➢ To calculate the optical properties like wavelength, refractive index and Cauchy's constant using spectrometer experiments.
➢ To carry out the electrical experiments toperformV-I characteristics, voltage regulation, single stage RC coupled amplifier, Hartley oscillator, Voltage doubler and tripler.

Any 14 of the following list of experiments:

1. Field along the axis of the coil – Vibration magnetometer
2. Determination of M and B_H – Tan A and Tan B
3. Potentiometer – Calibration of high range voltmeter
4. Ballistic Galvanometer – Current and voltage sensitiveness
5. Ballistic Galvanometer – Charge sensitiveness
6. Ballistic Galvanometer – Thermo emf
7. Spectrometer – i-d curve
8. Spectrometer – i-i' curve
9. Spectrometer – grating – normal incidence method
10. Spectrometer – grating – oblique incidence method
11. Spectrometer – Cauchy's constant
12. Newton's rings – radius of curvature
13. Bridge rectifier – with pi filter
14. Field along the axis of the coil – deflection magnetometer
15. Zener diode – V-I characteristics, Voltage regulation
16. Single stage RC coupled amplifier – CE mode
17. Hartley oscillator
18. Voltage doubler and tripler
19. Transistor static characteristics – CE mode

Course Outcomes

On completion of the course, the students will be able to
CO1: Find the M and B_H using Tan A and Tan B positions.
CO2: Measure the charge, current, voltage and thermo emf sensitiveness using B.G.

CO3: Determine the field along the axis of the coil using deflection magnetometer and vibration magnetometer

CO4: Measure the optical properties like wavelength, refractive index and Cauchy's constant using spectrometer experiments.

CO5: Carryout the electrical experiments toper form V-I characteristics, voltage regulation, single stage RC coupled amplifier, Hartley oscillator, Voltage doubler and tripler.

Mapping of Cos with PSOs & POS:

SEMESTER III&IV	Subject Code: 22UPYP24							Title of Paper: PHYSICS LAB – II					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=$\dfrac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}=\left(\dfrac{126}{51}\right)$														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	**COs of Physics Lab – II Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class : B.Sc. Physics   Part : SLC
Semester : IV   Hours : -
Subject Code : 22UPYSL4   Credits: 3

Novel Materials– (Self learning course)
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives
➢ To acquire knowledge of glass materials, composite ,metals and alloys and their properties.
➢ To describe the properties of novel materials for various industrial applications

Unit-1 Glass-Ceramics
Kinetic and thermodynamic criteria for glass formation, types of glasses and their chemical compositions, Physical properties of glasses, Nucleation and crystal growth in glasses, nucleation through micro miscibility, nucleating agents, properties and applications of glass-ceramics.

Unit-2 Metals & Alloys
Brief overview of commercial metals and alloys and their crystal structures. General properties of metals and alloys. Processing: Casting, solidification, powder metallurgy, hot workability, sheet metal forming, welding, elementary ideas of rolling, forging and extrusion. Carbon and alloy steels, Al, Ni, Zn, Ti, Mg based alloys.

Unit-3 Composite Materials
Composite Materials Types of composites and their advantages. Reinforcements: Glass, boron, carbon, organic and ceramic fibers, their structure, properties and processing.

Unit-4 Biomaterials
Introduction to biomaterials for biomedical applications, Chemical structure and property of biomaterials, Degradation of biomaterials, Polymeric biomaterials: Introduction, preparation, hydrogel biomaterials, Bio conjugation techniques, Biomaterials for drug delivery application

Unit-5 Chemical Sensors
Introduction to chemical sensing; Potentiometry: fundamental principles, membrane potentials, Applications of potentiometry: ion-selective electrodes, amperometry, glucose sensors in diabetes: more enzyme electrodes, immunosensors, ELISA, piezoelectric devices: quartz crystal microbalance, luminescent sensors and electrochemical luminescence.

References
1. Gladius Lewis, 1995, "Selection of Engineering Materials", Prentice Hall Inc. New Jersey USA,.
2. Bahadur and Sastry, 2002, Principles of Polymer Science, , Narosa Publishing House.

Course Outcomes

On completion of the course, the students will be able to

CO1: Describe the properties of glass material and its properties.

CO2: Acquire knowledge on metals and alloys.

CO3: Discuss on composite materials and its properties.

CO4: Illustrate the chemical structure and property of biomaterials,

CO5: Explain the properties of chemical sensors for various applications

Mapping of Cos with PSOs &Pos:

SEMESTER IV	Subject Code: 22UPYSL4								Title of Paper: Novel Materials					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= $\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}$ = $\left(\frac{125}{51}\right)$														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	**COs of Novel Materials Strongly related with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
Department of Physics - M. Sc. (Physics)
OBE - CBCS (2022-2023 Onwards)

SEMESTER - I			Hours	Credits
22PPYC11	Mathematical Physics-I	6	5
22PPYC21	Classical Mechanics	6	5
22PPYC31	Electromagnetic theory	6	5
22PPYE11	Elective – I	6	4
22PPYP12	Practical-I	3	-
22PPYP22	Practical-II	3	-
	Total	**30**	**19**

SEMESTER - II | | | |
---|---|---|---|---
| 22PPYC42 | Mathematical Physics-II | 6 | 5 |
| 22PPYC52 | Quantum Mechanics –I | 6 | 5 |
| 22PPYE22 | Elective – II | 6 | 4 |
| 22PPYN12 | Non-Major Elective | 4 | 4 |
| 20PLFS12 | Life Skills | 2+2* | 2 |
| 22PPYP12 | Practical-I | 3 | 4 |
| 22PPYP22 | Practical-II | 3 | 4 |
| | MOOC / SWAYAM | | 02** |
| | **Total** | **30+2** | **28** |

SEMESTER - III | | | |
---|---|---|---|---
| 22PPYC63 | Quantum Mechanics –II | 6 | 5 |
| 22PPYC73 | Solid State Physics- I | 6 | 5 |
| 22PPYC83 | Molecular Spectroscopy | 6 | 5 |
| 22PPYE33 | Elective – III | 6 | 4 |
| 22PPYP34 | Practical-III | 3 | - |
| 22PPYD14 | Project Work | 3 | - |
| | MOOC / SWAYAM | | 02** |
| | **Total** | **30** | **19** |

SEMESTER - IV | | | |
---|---|---|---|---
| 22PPYC94 | Solid State Physics- II | 6 | 5 |
| 22PPYD04 | Nuclear & Particle Physics | 6 | 5 |
| 22PPYE44 | Elective – IV | 6 | 4 |
| 22PPYP34 | Practical-III | 3 | 4 |
| 22PPYD14 | Project Work & Viva | 9 | 8 |
| | **Total** | **30** | **26** |

Non-major elective for other students: Energy physics

Self-Learning - MOOC / SWAYAM Course: II & III Sem (2 Credits for each course)

Semester	I	II	III	IV	**Total**
Credits	19	28	19	26	**92**

* Represents practical outside the class hour

** Extra credit course

List of Electives

1. Energy & Environmental Physics/Nanophysics	5. Photonics
2. Applied Electronics	6. Astrophysics
3. Thermodynamics and Statistical Physics	7. Microprocessor & Microcontroller
4. Applied Optics & Laser Physics	8. Medical Physics

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF PHYSICS

PROGRAMME SPECIFIC OUTCOMES (PSO)
On completion of M.Sc. Physics programme, the students will be able to,

PSO1: Comprehend the concepts of diverse fields in Physics.

PSO2: Exhibit proficiencies in applying various concepts of physics to fulfil the regional, national and global needs.

PSO3: Demonstrate experiments to analyse & interpret the concepts of physics that will enable them to shine in the field of education, research and development.

PSO4: Acquire the skills to perform collaborative inter-disciplinary activities and to undertake effective research.

PSO5: Work in the field of physics with the desire to make it as a lifelong learning process for their continued academic and professional development.

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: M.Sc. Physics	**Part**	: Core-6
Semester	: III	**Hours**	: 90
Code	: 22PPYC63	**Credits**	: 5

QUANTUM MECHANICS – II
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives
➢ To study the principle theories of quantum mechanical systems
➢ To understand scattering theory, relativistic & quantum field equations

UNIT 1 Variation Method & Perturbation Theory (18 hrs)

The Variational Principle-Rayleigh-Ritz Method-variation method of excited states-the Hellmann-Feynman Theorem-Ground state of Helium-Ground state of Deuteron-Time-dependent perturbation theory – I order perturbation – Harmonic perturbation – Transition to continum states- Fermi's Golden Rule-Absorption and Emission of Radiation-Electromagnetic Field-Electric dipole Approximation –Transion probability-Einstein's A and B coefficients-Forbidden transitions.

UNIT 2 Many Electron atoms (18 hrs)

Indistinguishable particles – Pauli principle – inclusion of Spin- Spin functions for two and three electrons – Helium atom – Thomas-Fermi model of the atom – Hartree Equation – Hartree-Fock Equation.

UNIT 3 Scattering (18 hours)

Scattering cross section- scattering amplitude – partial waves –partial waves analysis – significant number of partial waves – scattering by an attractive square –well potential – Breit-Wigner formula – scattering length – expression for phase shifts – Integral equation – The Born approximation – scattering by screened coulomb potential – validity of Born approximation.

UNIT 4 Relativistic Wave Equations (18 hrs)

Klein Gordon equation–Interpretation– Particle in a Coulomb field – Dirac's equation for free particle- Dirac's Matrixes- Probability Density-Plane Wave equation – Negative energy state- Spin of the Dirac particle- Magnetic moment of the electron- Spin orbit interaction -Radial Equation for an electron in a central potential -Hydrogen atom- Lamb shift

UNIT 5 Quantum Field Equation (18 hrs)

Classical Field equation- Lagrangian Form- Hamiltonian Form- Quantisation of the Field – Schrödinger equation – Classical theory of Electromagnetic field -Quantisation of Electromagnetic field.

References:

1. G. Aruldhas, Quantum Mechanics 2nd ed., Prentice Hall India Learning Pvt. Ltd (2008).
   - Unit I - Chapter : 10.1 – 10.6 & 12.1 – 12.7
   - Unit II - Chapter : 13.1 – 13.6, 13.8 – 13.10
   - Unit III - Chapter : 14.1 – 14.13
   - Unit IV - Chapter : 15.1 – 15.5, 15.7 – 15.15
   - Unit V - Chapter : 16.1 – 16.5, 16.9 & 16.10
2. Leonard I. Schiff, Jayendra Bandhyopadhyay, Quantum Mechanics, 3rd ed., McGraw Hill Education (2017).
3. Satya Prakash & Swati Saluja, Quantum Mechanics, Kedar Nath Ram Nath (2012).

4. P M Mathews, K Venkatesan, A Textbook of Quantum Mechanics, 2nd ed., McGraw Hill Education (2017).
5. Eugen Merzbacher, Quantum Mechanics, 3rd ed., John Wiley & Sons (1998).
6. J. J. Sakurai, Jim Napolitano, Modern Quantum Mechanics, 3rd ed., Cambridge University Press (2020).
7. Richard, L. Liboff, Introductory Quantum Mechanics, 4th ed., Pearson education (2002).
8. S. Devanarayanan, Quantum Mechanics: Principles & Applications, 2nd ed., Createspace Independent Publication (2016).
9. Chatwal and Anand, Quantum Mechanics, Himalaya Publishing House (2012).

Teaching Learning Methods:
- Lecture Method, ICT, Assignment, Quiz, Group Discussion

Course Outcomes

On completion of the course, students should be able to

CO1: Apply the variational principle and various Perturbation theories to quantum mechanical systems

CO2: Understand the structure, properties of molecules, and effects of symmetry and asymmetry wave functions.

CO3: Develop the required solutions for various scattering phenomena.

CO4: Apply Klein Gordon and Dirac equations to study the relativistic particles.

CO5: Compare the classical and quantum field equations

Mapping of COs with PSOs & POS:

SEMESTER III	Subject Code: 22PPYC63								Title of Paper: Quantum Mechanics – II					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	2	2			3	3	2	2	3	25
CO2	3	3		3	2	3			3	3	3	2	2	27
CO3	2	3		2	1	3			3	2	3	3	3	25
CO4	3	2		3	2	2			3	3	3	2	3	26
CO5	3	3		2	3	2			2	3	3	2	3	26
Grand total of COs with PSOs and POs														129
Mean value of COs with PSOs and POs=$\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}=\left(\frac{129}{50}\right)$														2.58

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			2.58
Observation	**COs of Quantum Mechanics – II Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: M.Sc. Physics	Part	: Core-7
Semester	: III	Hours	: 90
Code	: 22PPYC73	Credits: 5	

SOLID STATE PHYSICS – I
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives

➢ To understand the concepts of crystals defects and dislocations.
➢ To acquire knowledge of electronic conduction in solids

UNIT 1   Crystal Physics   (18 hrs)
Periodic arrangement of atoms – concepts of a lattice – lattice translation vectors – primitive lattice cell – two-and three dimensional lattice types – Miller indices of crystal planes – Simple crystal structures like sodium chloride type – cesium chloride type – hexagonal and face centered close packed structures – diamond structure and cubic zinc sulphide structure. Diffraction of waves by crystals :Bragg's law – Reciprocal lattice vectors – Laue equations – Brillouin zones – Reciprocal lattices to sc, bcc and fcc lattices – Fourier analysis of the basis and structure factors of bcc and fcc lattices.

UNIT 2   Defects and Dislocations   (18 hrs)
Lattice vacancies – Diffusion – Metals – Colorcenters – F centers – Other centers in alkali halides – Frenkel defects – Schottky defects. Shear strength of single crystals – Slip – Dislocation – Burgers vectors – Stress fields of dislocations – Strength of alloys – Dislocations and crystal growth – Whiskers.

UNIT 3   Phonons   (18 hrs)
Vibrations of linear monoatomic and diatomic chains – quantization of elastic waves – phonon momentum – Plank distribution for a system of identical harmonic oscillators – Periodic boundary condition and density of states in one and two dimensions – Einstein and Debye's theories of specific heat – Anharmonicity of lattice vibrations – thermal expansion – Thermal conductivity and umklapp processes.

UNIT 4   Free Electron in Crystals and Band Theory   (18 hrs)
Energy levels in one dimensions – Fermi-Dirac distribution for a free electron gas – periodic boundary condition and free electron gas in three dimensions – Heat capacity of the electron gas – Ohm's law – Matthiessen's rule and Umklapp process – Hall effect – Wiedemann – Franz law – Nearly free electron model and the origin and magnitude of the energy gap – Bloch functions – Motion of an electron in a periodic potential – Kronig-Penny model – Bloch theorem – Approximate solution near a zone boundary

UNIT 5   Electronic Conduction in Solids   (18 hrs)
Semiconductor crystals, fermi surfaces and metals Band gap in semiconductors – Equations of motion – holes and effective mass – Intrinsic mobility – Donor and acceptor states and thermal ionization of donors and acceptor – Reduced and periodic zone schemes – Construction of Fermi surfaces – Electron orbits – Tight-Binding method for energy bands – Wigner-Seitz method and cohesive energy – Quantization of orbits in a magnetic field – De Hass-Van Alphen effect.

References:

1. Charles Kittel, 2017, Introduction to Solid State Physics, VIII Edition
   [Unit I – Ch.1 and 2 (relevant titles)

Unit II – Ch.20 and 21 (relevant titles)
Unit III – Ch.4 and 5 (relevant titles)
Unit IV – Ch.6 and 7 (relevant titles)
Unit V – Ch.8 and 9 (relevant titles)]
2. S.O.Pillai, 2005, Solid State Physics, New Age International.
3. M.Ali Omar, 2001, Elementary Solid State Physics, Addison Wesley Pub.
4. Ashcroft and Mermin, 1996, Solid State Physics –Harcourt College Publ.
5. J.P.Srivastava, 2001, Elements of Solid State Physics –Prentice Hall of India.
6. P.K.Palanisamy, 2003, SolidState Physics –SCITECH.
7. B.S.Saxena, R.C.Gupta& P.N Saxena, 2000,Fundamentals of Solid State Physics, Pragati Prakashan Publications.

Teaching Learning Methods:
- Lecture Method, ICT, Assignment, Quiz, Group Discussion

Course Outcomes
On completion of the course, the students will be able to
CO1: Describe the concepts of crystals and lattices.
CO2: Discuss the theory of defects and dislocations.
CO3: Acquire knowledge of phonons and their thermal properties
CO4: Explain the concepts of free electron in crystals and band theory
CO5: Analyse the electronic conduction in solids by various methods.

Mapping of COs with PSOs & POs:

SEMESTER III	Subject Code: 22PPYC73								Title of Paper: SOLID STATE PHYSICS – I					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	2		2	1	2			3	3	3	2	3	23
CO2	3	1		2	2	2			3	2	3	3	2	23
CO3	2	2		2	2	3			3	2	3	2	3	24
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														122
Mean value of COs with PSOs and POs=$\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}=\left(\frac{122}{50}\right)$														2.44

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 Solid State Physics – I Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: M.Sc. Physics	Part	: Core-8
Semester	: III	Hours	: 90
Code	: 22PPYC83	Credits: 5	

MOLECULAR SPECTROSCOPY
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:
  ➢ To understand the concept of rotational, vibrational and electronic spectra of the molecules.
  ➢ To acquire the knowledge of the Raman effect, NMR, ESR spectroscopies and its applications.

UNIT –I   Microwave Spectroscopy   (18 hrs)
Classification of molecules – Interaction of Radiation with rotating molecule – Rotational Spectra of rigid diatomic molecule – Isotopic effect in rotational spectra – Intensity of rotational lines – Non-rigid rotator – vibrational excitation effect – linear polyatomic molecule – symmetric top molecule – Asymmectric top molecules – Microwave spectrometer – Information derived from rotational spectra.

UNIT – II   Infrared Spectroscopy   (18 hrs)
Vibrational energy of a diatomicmolecule – Infrared Spectra – preliminaries – Infrared selection rule – vibrating diatomic molecule – diatomic vibrating rotator – Asymmetry of rotation – Vibration band – vibrations of polyatomic molecules – more about anharmonicity – fermi resonance –IR spectrophotometer – Instrumentation – Sample handling techniques – Fourier transform infrared spectroscopy – Applications: Identification of molecular constituents - characterisation of the transistion phase of ceramics

UNIT – III   Raman Spectroscopy   (18 hrs)
Introduction – Theory of Raman scattering – Rotation Raman spectra – Vibrational Raman spectra – Mutual Exclusion principle – Raman spectrometer – Sample handling techniques – Polarization of Raman scattered light –Structure determination using IR and Raman spectroscopy.
Nonlinear Raman phenomena – Preliminaries – Hyper Raman Effect – Simulated Raman scattering – Inverse Raman effect.

UNIT – IV   Electronic Spectroscopy   (18 hrs)
Introduction – Vibrational coarsestructure – Vibrational analysis of band systems – Deslandres Table – Progressions and sequences – Information derived from vibrational analysis – Franck-Condon principle – Intensity of vibrational electronic spectra – Rotational fine structure of electronic-vibration spectra – The FortratParabolae – Dissociation – Predissociation.

UNIT – V   Resonance Spectroscopy   (18 hrs)
Nuclear Magnetic resonance – NMR instrumentation – Relaxation process – Bloch equation – Dipolar interaction – Chemical shift – Indirect spin-spin interaction – NMR imaging – Electron spin resonance – Principle – ESR spectrometer –Mossbauer Spectroscopy – Recoilless emission and absorption – Experimental techniques – Isomer shift.

References:

1. Aruldhas, G., 2004, Molecular Structure and Spectroscopy, Prentice Hall of India, Edition - II.
   Unit I – Ch.6 – excluding 6.11 and 6.12;
   Unit II – Ch.7 –7.1-7.9, 7.16-7.19 (7.19.1,7.19.3);
   Unit III – Ch.8 – 8.1-8.8, 8.10, Ch.15 (15.1-15.4) ;
   Unit IV – Ch.9 – 9.1-9.10 ;
   Unit V – Ch.10 – 10.1-10.8, 10.19, Ch.11(11.1-11.3), Ch.13 (13.1-13.3).
2. Banwell and McCash, 2007, Fundamentals of Molecular Spectroscopy –Tata McGraw Hill
3. Jack D.Graybel, 1993, Molecular Spectroscopy –McGraw Hill.
4. G.M.Barrow, 2021, Introduction to Molecular Spectroscopy –Hassell Street Press.
5. Staughan and Walker, 1976, Spectroscopy –Chapman and Hall Publ.

Teaching Learning Methods:

- Lecture Method, ICT, Assignment, Quiz, Group Discussion

Course Outcomes

On completion of the course, students should be able to

CO1: Illustrate the concept of the rotational spectra of molecules.
CO2: Get an insight into the vibrational spectroscopy.
CO3: Appreciate Raman effect and its applications.
CO4: Analyse the intensity of vibrational electronic spectra.
CO5: Explain the NMR and ESR spectroscopy.

Mapping of COs with PSOs & POs:

SEMESTER III	Subject Code: 22PPYC83								Title of Paper: MOLECULAR 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		3	2	3			3	3	3	3	2	27
CO2	3	3		3	3	3			3	3	2	3	3	29
CO3	3	2		3	2	3			3	3	3	2	3	27
CO4	3	3		3	3	1			3	3	2	3	3	27
CO5	3	3		2	3	3			3	3	2	3	3	28
Grand total of COs with PSOs and POs														138
Mean value of COs with PSOs and POs=$\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}=\left(\frac{138}{50}\right)$														2.76

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 Molecular Spectroscopy Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: M.Sc. Physics	Part	: Elective-3
Semester	: III	Hours	: 90
Code	: 22PPYE33	Credits	: 4

THERMODYNAMICS AND STATISTICAL PHYSICS
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:
➢ To conceptualize the state of system at equilibrium and comprehend the statistical thermodynamic parameters.
➢ To understand the statistical distribution function and apply for various systems.

UNIT: I Thermodynamic **(18 hrs)**
The laws of thermodynamics– Combined first and second law of thermodynamics (T & V independent, T & P independent, P & V independent and Tds equations) – Properties of Van-der Walls Gas - The Helmholtz function and the Gibbs function – Thermodynamic potentials – Maxwell's relations – Stable and unstable equilibrium – Phase transition – The Clausius-Clapeyron equation – The third law of thermodynamics (Nernst Heat theorem).

UNIT: II Applications of Thermodynamics **(18 hrs)**
Chemical potential – Phase equilibrium and phase rule – The Gibbs-Duhem Equation – Dependence of vapour pressure on total pressure – Surface tension – Vapour pressure of a liquid drop – The reversible voltaic cell – Thermodynamics of Blackbody radiation – Thermodynamics of magnetism.

UNIT: III Statistical Thermodynamics **(18 hrs)**
The Statistical basis of thermodynamics –Energy states and energy levels – Microstates and macrostates – Thermodynamic probability – Ensemble: Ensemble – Canonical ensemble – Ideal gas in the canonical ensemble – Entropy and other thermodynamic functions – The Grand Canonical ensemble – The Micro canonical ensemble-Analytical nature

UNIT: IV Statistical Distribution Functions **(18 hrs)**
Statistics: Bose-Einstein statistics - Fermi-Dirac statistics - Maxwell-Boltzmann statistics – The statistical interpretation of entropy.
Distribution function: Bose - Einstein distribution function - Fermi-Dirac distribution function - Comparison of distribution functions for indistinguishable particles - Maxwell-Boltzmann distribution function - The partition function of a system – Thermodynamic properties of a system.

UNIT: V Applications of Statistical Physics **(18 hrs)**
Applications – The monatomic ideal gas – The Sackur Tetrode equation for the monoatomic ideal gas – The distribution of molecular velocities – The Principle of equipartition of energy –The quantized linear oscillator – The Einstein theory of the Specific heat capacity of a solid – The Debye theory of the specific heat capacity of solid – Black body radiation.

REFERENCE BOOKS:
1. Thermodynamics, Kinetic theory and Statistical Thermodynamics - F W Sears and G L Salinger, 3rd edition, Narosa Publishing House, 2013.
   UNIT: I : Chapter 6 : 6.1 – 6.5 & 6.8&Chapter 7 : 7.1 – 7.7
   UNIT: II : Chapter 8 : 8.1 – 8.9
   UNIT: III : Chapter 11: 11.1 – 11.4 and Ensembles* - Reference book (2)

UNIT: IV   : Chapter 11: 11.9 – 11.15

UNIT: V   : Chapter 12: 12.1 - 12.2, 12.5, and 12.6& Chapter 13:13.1 - 13.3

2. Heat Thermodynamics and Statistical Physics – S L Kakani, 2nd Edition, Sultan Chand Publishers, 2009

    Unit IV   : Chapter 13 : 13.6

3. Statistical Thermodynamics - M C Gupta, 3rd edition, New Age International Private Limited, 2021.
4. Thermodynamics and Statistical Physics - Satya Prakash, S S Singhal, J P Agarwal, Pragati Prakashan, 2020.
5. Introduction to statistical mechanics – S K Sinha, Narosa Publications, 2009.
6. Statistical Physics - F Reif, Tata McGraw Hill Education India, 2008.
7. Statistical Physics Thermodynamics and Kinetic Theory – V S Bhatia, Vishal Publishing Company, 2006.

Teaching Learning Methods:
- Lecture Method, ICT, Assignment, Quiz, Group Discussion

Course Outcomes:

CO1: To understand the laws and concepts of thermodynamics

CO2: To analyse the thermodynamic behaviour in various systems.

CO3: To describe the thermodynamics probabilities of micro state and macro state

CO4: To understand the various statistical distribution function

CO5: To apply the concepts of statistical distribution function to various system

Mapping of COs with POs and PSOs

SEMESTER III	Subject Code: 22PPYE33								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			3	3	3	3	3	28
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														135
Mean value of COs with PSOs and POs=$\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}=\left(\frac{135}{50}\right)$														2.70

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			2.70
Observation	**COs of Nanophysics Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: M.Sc. Physics	Part	: Elective-3
Semester	: III	Hours	: 90
Code	: 22PPYE33	Credits	: 4

MICROPROCESSORS & MICROCONTROLLER
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives
- ➢ To understand the concepts of microprocessors & Microcontrollers, programming and interfacing.
- ➢ To understand organizations of 8051, addressing modes, assembly language program examples using 8051 microcontrollers

UNIT 1: 8085 Microprocessor **(18 hrs)**
8085 and its architecture – ALU – registers – Data and Address bus- Pin Configuration - Opcode and Operands - Instruction Cycles – Fetch operation – Execute operation – Machine cycle and state – Instruction and Data flow – Timing Diagram – Timing Diagram for opcode fetch cycle – memory read/write – I/O read/write

UNIT 2 : Programming Techniques **(18 hrs)**
Introduction – Instruction and data formats –Ad dressing modes: Direct Addressing – register addressing – register indirect addressing – immediate addressing – implicit addressing – Introduction to 8085 instructions groups: Data transfer groups – arithmetic groups – logic groups – branch groups –stack, I/O and machine Control groups – subroutines.

UNIT 3 : Assembly Language Programs **(18 hrs)**
Introduction: Simple examples – addition/subtraction of two 8/16 bit numbers – decimal addition/subtraction of two 8 bit numbers – find one's/two's compliment of 8/16 bit numbers – to find the largest/smallest number in a data array – multiplication/divisions of two 8 bit numbers – 7 segment LED display – microprocessor based traffic control program.

UNIT 4 : 8051 Micro Controller **(18 hrs)**
Introduction – 8051 microcontroller – architecture – registers – Pins of Intel 8051 – I/O lines – 8051 Interrupts – Timer/counter 0 and Timer/Counter 1 – Boolean Processor - Instruction set –Serial Port.

UNIT 5: 8051 Micro Controller Programming Techniques & Programs **(18 hrs)**
Memory organizations of 8051 – Addressing modes – classifications of Instructions – Descriptions of 8051 Instructions – Data transfer, Arithmetic, logic and branching instructions - assembly language program examples: Addition/subtraction of two 8 bit numbers, to find largest/smallest numbers from a set of numbers, multiplication/division of two 8 bit numbers.

References:
1. Fundamentals of Microprocessors and Micro Computers – Ram, B., 2016, Dhanpat Rai Publications. (8th Edition)
   Unit – I: Sec.3.0 – 3.3.,
   Unit – II : Sec.4.1 – 4.6,
   Unit – III : Sec.6.1 – 6.12, 6.29-6.30, 9.3, 9.8,
   Unit – IV : Sec.10.1 – 10.1.9,

Unit – V: Sec.10.1.13 – 10.1.17

2. Microprocessor Architecture, Programming and application with 8085 – Ramesh Gaonkar, 2013, Penram International Publishing (6th edition).
3. Introduction to Microprocessor – Aditya P. Mathur,2018, Tata McCraw Hill (3rd Edition).
4. Microcontroller Theory & Applications - Ajay V.Deshmukh, 2017, McGraw Hill Edu.
5. Microprocessors and Interfacing, Programming and Hardware -Douglas V Hall, SSSP Rao,2017, McGraw Hill Education (3rd edition).

Teaching Learning Methods:
- Lecture Method, ICT, Demonstration, Assignment, Quiz, Group Discussion

Course Outcomes

On completion of the course, the students will be able to

CO 1: learn about 8085 microprocessor architecture and its basic principles.

CO 2: Classify the data transfer, arithmetic and logical operations.

CO 3: Write the assembly language program using different operations/instructions.

CO 4: Understand the 8051-microcontroller hardware and its functions.

CO 5: understand organizations of 8051, addressing modes, assembly language program examples using 8051 microcontrollers.

Mapping of COs with PSOs & POs:

SEMESTER III	Subject Code: 22PPYE33								Title of Paper: Microprocessors & Microcontroller					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	2	1			3	3	2	2	2	23
CO2	3	2		2	2	2			3	2	3	2	2	23
CO3	3	2		3	1	3			3	2	3	1	2	23
CO4	3	2		2	1	1			3	2	3	2	1	20
CO5	3	2		1	3	1			2	3	3	2	2	22
Grand total of COs with PSOs and POs														111
Mean value of COs with PSOs and POs=$\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}$ = $\left(\frac{111}{50}\right)$														2.22

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			2.22
Observation	**COs of Microprocessors Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: M.Sc. Physics	**Part**	: Lab - 3
Semester	: III & IV	**Hours**	: 90
Subject Code	: 22PPYP34	**Credits**	: 4

PRACTICAL – III
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives

➢ To construct and apply the physics principles of digital electronics, microprocessor, microcontroller and Arduino in the following experiments and their applications

Any 12 of the following list of experiments:
1. R-S,J-K and D-flip flops
2. Shift registers
3. Different mod counters (Scalar using IC 7490)
4. Asynchronous counters
5. Encoder / Decoder
6. Multiplexer and Demultiplexer
7. Arithmetic and logic unit
8. Karnaugh Map
9. Microprocessor – I (1 bit and 2-bit numbers shift by left and right, largest and smallest, block data transfer)
10. Microprocessor – II (1's and 2's complement subtraction, sum of series binary and decimal)
11. Microprocessor – III (seven segment display and interfacing with seven segment display).
12. Microprocessor – IV (interfacing with traffic controller and stepper motor)
13. Microprocessor – V (interfacing with DAC)
14. Microcontroller – AD & DA Converter
15. Microcontroller – Seven Segment Display
16. Microcontroller – Matrix Keyboard
17. Microcontroller – LCD & RTC
18. Arduino using Stepper motor
19. Arduino using relay control

Teaching Learning Methods:
• Lecture Method, Demonstration, Hands-on session

Course Outcomes
On completion of the course, the students will be able to
CO 1: Construct the registers and counters using flip flops
CO 2: Construct a decimal to BCD encoder and decoder
CO 3: Analyse the Arithmetic and logic units.
CO 4: Study the various operations and interfacing using microprocessor
CO 5: Use the microcontroller programming for various applications.

Mapping of COs with PSOs & POs:

SEMESTER III & IV	Subject Code:22PPYP24								Title of Paper: PRACTICAL – III					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		1	3	2	3	3	3	29
CO3	3	3		3	2	3			3	2	3	3	3	28
CO4	3	2		3	2	2		1	2	3	2	3	3	26
CO5	3	3		2	2	2			3	2	3	3	3	26
Grand total of COs with PSOs and POs														134
Mean value of COs with PSOs and POs $=\dfrac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}=\left(\dfrac{134}{52}\right)$														2.58

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			2.58
Observation	**COs of Practical – III Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: M.Sc. Physics	Part	: Core-9
Semester	: IV	Hours	: 90
Code	: 22PPYC94	Credits	: 5

SOLID STATE PHYSICS – II
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives

➢ To understand the physical significance of super conductivity and magnetism
➢ To study the concepts of dielectrics and the phenomenon of surface and interface physics.

UNIT I   Plasmons, Polaritons and Polarons and Optical processes and Excitons
(18 hrs)

Dielectric function of the electron gas – longitudinal plasma oscillation – plasmons – Electrostatic screening – Screened coulomb potential – Mott transition – Screening and phonons in metals – Polaritons and LST relation – Electron – Electron interaction – phonon interaction and polarons – Peierls instability – Kramers – Kronig dispersion relations – Frenkel and Mott – Wannier excitons – Exciton condensation – Raman effect in crystals.

UNIT II   Super Conductivity   (18 hrs)

Its occurrence and its destruction by magnetic fields – Miessner effect – Heat capacity – Energy gap – microwave and infrared properties and isotope effect – Stabilization energy of a superconductor – London theory of Meissner effect – coherence length – Basic ideas of BCS – flux quantization – Type II superconductors and vortex state – Single particle tunnelling DC and AC Josephson effects – Macroscopic quantum interference – High temperature super conducting (HTC) materials.

UNIT III   Magnetism in Solids   (18 hrs)

Langevin diamagnetism equation and quantum theory of dia-magnetism – Quantum theory of para magnetism – Hund's rules – Crystal field splitting and quenching of orbital angular momentum – Spectroscopic splitting factor – Van vleck temperature independent paramagnetism – Ferro magnetism : Curie point – Weiss molecular field theory – Saturation magnetization – Quantization of spin waves (magnons) and thermal excitation of magnons – Ferromagnetism and antiferromagnetism – Neel temperature – Ferromagnetic domain walls and origin of domains – Coercivity and hysteresis.

UNIT IV   Dielectrics   (18 hrs)

Maxwell equations- Polarization- Macroscopic electric field- Depolarization field-Local electric field at an atom- Lorentz field-Field of dipoles in cavity-Dielectric constant and polarizability- Electronic plolarizability- classical theory of electronic plolarizability- Structure phase transitions

UNIT V   Surface and Interface Physics, Alloys, Ferroelectrics   (18 hrs)

IQHE and FQHE – PN junction – Rectification – Solar cells – Photovoltaic detectors. Substitutional solid solutions – Hume Rothery rules – Elementary theory of order – Kondo effect. Ferro electric crystals – Classification – Displacive transition – Soft optical phonon – Landau theory of phase transition – first order and second order transition.

References:

1. Charles Kittel, 2017, Introduction to Solid State Physics, VIII Edition
   [Unit I – Ch.14 and 15 (relevant titles)

Unit II – Ch.10 (relevant titles)
Unit III – Ch.11 and 12 (relevant titles)
Unit IV – Ch. 16 (relevant titles)
Unit V – Ch. 16, 17and 22 (relevant titles)]
2. S.O.Pillai, 2005, Solid State Physics, New Age International.
3. M.Ali Omar, 2001, Elementary Solid State Physics: Principles and Applications, Addison Wesley Pub.
4. Ashcroft and Mermin, 1996, Solid State Physics –Harcourt Asia Publ.
5. J.P.Srivastava, 2001, Elements of Solid State Physics –Prentice Hall of India.
6. P.K.Palanisamy, 2003, Solid State Physics –SCITECH.
   B.S.Saxena, R.C.Gupta& P.N Saxena, 2000, PragatiPrakashan - Fundamentals of Solid State Physics

Teaching Learning Methods:
- Lecture Method, ICT, Assignment, Quiz, Group Discussion

Course Outcomes

On completion of the course, the students will be able to

CO1: Interpret the physical importance of excitation and optical processes in solids.

CO2: Describe the concepts of super conductivity by different theories.

CO3: Analyse the different types of magnetism and its effects in solids .

CO4: Investigate the concepts of dielectrics and its related theories.

CO5: Illustrate the phenomenon of surface and interface physics.

Mapping of COs with PSOs & POs:

SEMESTER IV	Subject Code: 22PPYC94								Title of Paper: SOLID STATE PHYSICS – II					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			3	3	3	2	3	24
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														125
Mean value of COs with PSOs and POs=$\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}$ = $\left(\frac{125}{50}\right)$														2.50

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			2.50
Observation	**COs of Solid State Physics – II Strongly related with PSOs and POs**		

Class	: M.Sc. Physics	Part	: Core-10
Semester	: IV	Hours	: 90
Code	: 22PPYD04	Credits	: 5

NUCLEAR AND PARTICLE PHYSICS
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:

➢ To understand the basics of nuclear properties, and to compare different forces, models, reactions, radio activity and sub-nuclear particles.

UNIT I   Nuclear Properties and Nuclear Forces   (18 hrs)

Charge – mass – radius – angular momentum (spin) – Magnetic dipole moment – Electric quadrapole moment – Parity – Isobaric spin (isospin) – The nuclear level – Nuclear forces : Introduction – Deuteron (properties of Nuclear force, no excited S-states, range and depth of potential – Excited states of the Deuteron) – Neutron – Proton scattering at low energies (Scattering length, Phase shift, Spin-dependence) – Proton – Proton scattering at low energies – Similarity between nn and pp forces – Non-central forces (Experimental evidence for the non-central forces, General form of this force, its properties - Meson theory of nuclear forces.

UNIT II   Radio Activity   (18 hrs)

Laws of radioactivity – radioactive equilibrium – radioactive series – isotopes - α-decay - α-particle spectra – Gamow's theory of α-decay –β-decay - β-spectroscopy (no instrumentation) – neutrino –direct method – Fermi theory – Gamma radiation – measurement of γ-ray energies (wavelength measurement by crystal diffraction)– Internal conversion (idea only) - Internal pair creation – nuclear isomerism.

UNIT III   Nuclear Models   (18 hrs)

Introduction – Fermi gas model – Liquid drop model – Shell model (Magic numbers , Extreme single particle model, (Square well of infinite depth, Harmonic Oscillator Potential, Spin-Orbit Potential), Predictions of Shell Model- Basic Concepts of Collective Nuclear Model, Unified Model, Superconductivity model.

UNIT IV   Nuclear Reactions, Fission And Fusion   (18 hrs)

Kinds of Nuclear reactions – Conservation Laws – Nuclear reaction kinematics —– Nuclear cross section – Compound nucleus – Nuclear transmutations – By alpha particles - by protons – by neutrons – by deuterons -Direct reactions (Stripping reactions, Pickup reactions), Stripping reactions and the shell model. Nuclear Fission (Types of Fission, Distribution of fission products, Neutron Emission in Fission, Fissile and Fertile materials, Spontaneous fission, Deformation of liquid drop, Bohr and Wheeler's Theory – Quantum effects) - Nuclear Fusion and Thermo nuclear reactions – Controlled thermonuclear reactions (hydrogen bomb, Different methods for the production of fusion reactions)

UNIT V   Sub-Nuclear Physics   (18 hrs)

Inroduction – Classifiation of Elementary particles – Fundamental interactions – Conservation laws – Conservation of isospin, strangeness, hypercharge, conjugation, parity, combined inversion, time reversal, CPT – Elementary particle symmetry – SU(2) group – SU(3) group – Quark.

References:

1. Tayal, D.C., 2021, Nuclear Physics, 5th Ed., Himalaya Publishing House.

Unit – I: Chapter 8,
Unit- II: Sections 2.1-2.3,2.11,2.12,5.5-5.6, 6.1-6.3, 6.5, 7.1-7.2, 7.4 -7.6,
Unit – III: Chapter 9
Unit - IV: Chapters 10, Sections 10.1-10.4, 10.7, 10.16, 10.24, 10.25, Chapter 13, Sections 13.1- 13.3
Unit V: Chapter 18, Sections 18.1- 18.4, 18.18, 18.19

2. Irving Kaplan, 2002, Nuclear Physics, Revised Ed., Addison Wesley, New York.
3. Roy and Nigam, 2014, Nuclear Physics. 2nd Ed., New Age Intl., New Delhi.
4. Fujia Yang and Joseph Hamilton, 2010, Modern atomic and Nuclear Physics, Revised Ed., McGraw Hill.
5. V. K. Mittal,2018, Introduction to Nuclear and Particle Physics, 4th Ed., PHI Learning.

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 structure, properties of nucleus and the concept of nuclear forces.

CO2: Acquire the knowledge of nuclear decays and radioactivity.

CO3: Discuss the different types of nuclear models.

CO4: Apply the knowledge of nuclear reactions for producing fission andfusion energy.

CO5: Explain the symmetry properties & Quark model of elementary particles.

Mapping of COs with PSOs & POs:

SEMESTER IV	Subject Code: 22PPYD14								Title of Paper: Nuclear And Particle 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	3	2			3	2	3	2	3	25
CO2	2	3		3	3	3			3	3	2	2	3	27
CO3	3	3		3	2	3			3	2	3	3	3	28
CO4	2	3		3	3	2			3	3	3	3	2	27
CO5	3	2		3	3	2			3	3	2	3	3	27
Grand total of COs with PSOs and POs														134
Mean value of COs with PSOs and POs= $\dfrac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}$ = $\left(\dfrac{134}{50}\right)$														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	**COs of Nuclear and Particle Physics Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: M.Sc. Physics	Part	: Core Elective-4
Semester	: IV	Hours	: 90
Code	: 22PPYE44	Credits	: 4

APPLIED OPTICS AND LASER PHYSICS
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives
➢ To study the applications of optics such as LASERs and fiber optics and the corresponding theory
➢ To describe the electro optic effects, non-linear optical effects and their applications in various crystals.

UNIT I Laser- I **(18 hrs)**
Einstein coefficients – Light amplification – threshold condition – Laser rate equations – variation of Laser power around threshold- Optimum output coupling – Line broadening mechanisms

UNIT II   Laser-II **(18 hrs)**
Modes of a rectangular cavity and the open planar resonator- Quality factor – The ultimate line width of the Laser – Mode Selection – Q- Switching – Mode locking in Lasers – General spherical resonator – High order modes

UNIT III Laser Systems & Spatial frequency filtering **(18 hrs)**
Laser System- Ruby Laser - Neodymium based Lasers – He-Ne Laser – Argon ion Laser – CO_2 Laser – Dye Laser – Excimer Lasers
Spatial frequency filtering: Introduction - Fourier Transform and some of its important properties – F.T property of a thin lens – some elementary examples of the Fourier transforming property of a lens

UNIT IV Electro-Optic Effect **(18 hrs)**
Electro-optic effect in KDP crystals: longitudinal mode & transverse mode – electro-optic effect in lithium niobate and lithium tantalate crystals- general considerations on modulator design- The index ellipsoid in the presence of an external electric field.

UNIT V Optical Fiber& Non- Linear Optics **(18 hrs)**
Optical fiber – Numerical aperture (NA) – Pulse dispersion in step index fibers.
Non-linear optics: Introduction – Self Focusing phenomenon- Second Harmonic Generation- Calculation of nonlinear polarization - Effect of deviation from the phase matching angle- Coupled equation and their solution - Generation of sum and difference frequencies.

References:
1. Ajoy Ghatak & K. Thyagarajan, 2017 (Reprint), Optical Electronics, First Edition, Cambridge University Press.
    [UNIT-I: Chapters 8.1 -8.8 Pages 201- 243
    UNIT –II Chapters : 9.1-9.7.1, 9.9, Pages 245-280,287 – 293.
    UNIT- III Chapters: 10.1-10.8 & 6.1 – 6.4 Pages 294-308, 167-169
    UNIT-IV Chapters : 15.1-15.5.3, 15.6 – 15.6.2, Pages 461-484,492 – 498.
    UNIT-V: Chapters – 13.1-13.4, 20.1-20.3, Pages 364-368 & 564-569]
2. B.B.Laud, 2011, Lasers& Non – Linear Optics, New Age International Pvt. Ltd.

3.   Senior John, M., 2014, Optical Fiber communication: Principles and Practice, 3[rd]ed., Pearson Education, New Delhi.

Teaching Learning Methods:
- Lecture Method, ICT, Assignment, Quiz, Group Discussion

Course Outcomes

On completion of the course, the students will be able to

CO1: Enhance the knowledge of comprehensive principles of Laser and its mechanisms.

CO2: Evaluate the knowledge of Q-switching and mode locked lasing phenomenon.

CO3: Understand and explain the various laser systems and Fourier transform properties of lens systems.

CO4: Discuss the electro optic effects and their applications in various crystals.

CO5: Acquire the knowledge of optical Fiber and Interpret the concepts of non-linear optics.

Mapping of COs with PSOs & POs:

SEMESTER IV	Subject Code: 22PPYE44								Title of Paper: Applied Optics and Laser 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	2	2			3	3	2	2	3	26
CO2	3	3		3	2	3			2	3	3	1	3	26
CO3	3	3		2	3	2			3	2	3	2	3	26
CO4	3	3		3	2	3			3	3	2	3	3	28
CO5	3	3		2	3	2			3	3	3	2	3	27
Grand total of COs with PSOs and POs														133
Mean value of COs with PSOs and POs=$\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}=\left(\frac{133}{50}\right)$														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	**COs of Applied Optics and Laser Physics Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics - M.Sc. (Physics) Syllabus – 2015 - 16 onwards

Class	: I PG	Part	: Core Elective - 1
Semester	: I	Credits	: 4
Code	: 22PPYE11	Hours	: 90

PHOTONICS

Objective : To understand the properties of light and the linear and non-linear interactions of light with matter.

UNIT 1 Properties and Description of Light   (18 hrs)
Properties of photons – lane waves monochromatic light – Gaussian beams – Ray matrices – Describing light polarization- Light characteristics – Statistical properties of photon fields – Interference and coherence light.

UNIT 2 Linear Interactions With Matter   (18 hrs)
Refraction and Dispersion – Absorption and Emission – Measurement of absorption – polarization in refraction and reflection – Relation between reflection, absorption, refraction – Birefringence – Optical activity – Diffraction- Light scattering processes – Optical materials.

UNIT 3 Nonlinear Interactions   (18 hrs)
Nonresonant interactions – Nonlinear polarization of the medium – Second order effects – Third order effects – Higher order nonlinear effects – Materials for nonresonant nonlinear interactions.

UNIT 4 Nonlinear Interactions Without Interactions   (18 hrs)
Homogeneous and inhomogeneous broadening – Incoherent interaction – Coherent resonant interaction – Two photon and multiphoton abortion – photoionization and optical breakdown – Optical damage – Laser material processing – Combined interactions – Materials in resonant nonlinear optics.

UNIT 5 Nonlinear Optical Spectroscopy   (18 hrs)
General procedure – Conventional absorption measurements – Conventional emission measurements – Nonlinear transmission measurements – Nonlinear emission measurements.

REFERENCE:

1. Ralf Menzel, 2001, Photonics: Linear and nonlinear interactions of laser light with matter, Springer International Edition
   [relevant sections from Ch.2, 3, 4, 5, 7]

Arul Anandar College (Autonomous), Karumathur
Department of Physics - M.Sc. (Physics) Syllabus – 2015 - 16 onwards

Class	: I PG	Part	: Core Elective - 2
Semester	: II	Credits	: 4
Code	: 22PPYE22	Hours	: 90

ASTROPHYSICS

Course Objectives:

➢ To study the properties of stars and their evolution and to understand the origin and structure of the universe.

UNIT 1 Astronomical Instruments And Space Astronomy   (18 hrs)

Introduction – Optical telescopes – Optical photometric instruments and techniques – Optical spectroscopy – Radio telescopes – Miscellaneous remarks – Infrared astronomy – Ultraviolet astronomy – X-ray astronomy – Gamma ray astronomy – The Hubble space telescope.

UNIT 2 Properties of Stars - I   (18 hrs)

Apparent luminosities of stars – Magnitude scale – measurement of apparent luminosity – various magnitude systems – Corrections for observed magnitudes – Stellar distances and absolute luminosity – Measurement of distances within the solar system – Trigonometric parallaxes of stars – The method of luminosity distance.

UNIT 3 Properties of Stars - II   (18 hrs)

Surface temperature of stars – Introduction – Laws for radiation in thermodynamic equilibrium – Application of radiation laws to stellar photospheres – Defining temperature of stars by matter laws – Spectral classification of stars – Masses and radii of stars – Kepler's third law – Binary stars – Measurement of stellar radii – Important relation between stellar parameters – Stellar energy sources (only qualitatively).

UNIT 4 Stellar Evolution   (18 hrs)

Evolution near the main sequence – Star formation – Pre-main sequence contraction – post-main sequence evolution – Nucleosynthesis – Super dense remnants – Evolution of close binary systems

UNIT 5 External Galaxies and Cosmology   (18 hrs)

Building blocks of the universe – Radio galaxies and quasars – Clusters and multiple galaxies – Cosmology – Introduction – Some specific cosmological models – Past and future of the universe.

REFERENCES:

1. K.D.Abyankar, 2001, Astrophysics : Stars and Galaxies, Universities Press,.
   [relevant titles from Chs.3,4, 5, 6, 10, 17, 18, 19, 20].
2. Bradley W.Carrol and Dale A.Ostlie, 2007, An Introduction to Modern Astrophysics, 2nd ed., Pearson International Edition.

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: M.Sc. Physics	Part	: Core – Elective - 4
Semester	: IV	Hours	: 90
Code	: 22PPYE44	Credits	: 4

MEDICAL PHYSICS
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:
➢ To understand the interaction of radiation with matter and its effects.
➢ To study radiation therapy, radiological imaging and scanning techniques.

UNIT –I: Radiation, Radiation Dosimetry and Definitions   (18 hrs)
Radiation – classification of radiation - definitions of Dosimetry Quantities (DQ) - Units and relationship between DQ – relative biological effectiveness – radiation weighting factor, equivalent dose and sievert - linear energy transfer - tissue weighting factor - charged particle equilibrium - biological effects of radiation.

UNIT – II: Interaction of gamma rays and X-rays with matter   (18 hrs)
Introduction - Types of interaction with matter – Photo electric absorption – Compton scattering – Pair production - Over all interaction of photons with matter – Linear attenuation co-efficient – Half-value thickness – Mean free path

UNIT –III: Treatment planning in radiation therapy   (18 hrs)
Photon beam treatment planning – Therapeutic response - Radiation Therapy Process - Patient Positioning and Immobilization – Pre-treatment Simulation – Conventional Simulator – Computed Tomography Simulator – Positron Emission Tomography - Electron beam treatment planning - Dosimetric Data for Clinical Electron Beams. – Depth dose profiles – Variation with beam energy – Variation with field size – off-axis dose profile – Electron beam energy specification – Isodose curves

UNIT –IV: Introduction to Radiological Images   (18 hrs)
X-ray Generator – Attenuation – Major Types of Interactions – Half-value layer and tenth-value layer – Collimator – Anti-scatter grids – screens – Photo -stimulable phosphor (PSP) – image quality measures – signal-to-noise ratio (SNR)

UNIT –V: Magnetic Resonance Imaging (MRI) and Computerized Tomography (CT)
(18 hrs)
MRI –contrasts in MRI –Physiological and functional MRI –MRI safety –future MRI applications. CT and MRI Radiotherapy: CT based treatment simulation and planning –MRI in Radiotherapy

REFERENCES:
1. Introduction to Medical Physics – Muhammad Maqbool –Springer International Publishing (2017).

Unit – I:	Chapter - 1:	Sections: 1.1
	Chapter - 2:	Sections: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.11, 2.14.
Unit – II:	Chapter - 3:	Sections: 3.1, 3.2.1, 3.2.2, 3.2.3, 3.3, 3.3.1, 3.3.2, 3.3.3.
Unit – III:	Chapter - 4:	Sections: 4.1, 4.1.2, 4.1.3, 4.1.5, 4.1.6, 4.1.6.1, 4.1.6.2, 4.1.6.4, 4.2, 4.2.2, 4.2.2.1, 4.2.2.2, 4.2.2.3, 4.2.2.4, 4.2.2.5, 4.2.2.6.
Unit – IV:	Chapter - 6:	Sections: 6.1, 6.2, 6.3, 6.3.1, 6.3.2, 6.4, 6.5, 6.6, 6.7, 6.8, 6.8.1.

Unit – V: Chapter - 9:   Sections: 9.1, 9.3, 9.4, 9.5
                 Chapter - 10:   Sections: 10.1, 10.2, 10.3.

2. R. S. Khandpur,1999, Handbook of Biomedical Instrumentation - Tata McGraw-Hill, New Delhi.
3. Glenn. F. Knoll, 2010, Radiation Detection and Measurements - John Wiley & Sons, Inc. New York.

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 quantities used to define radiation and its effects.
CO2: Analysethe characteristics of interaction of gamma rays and x-rays with matter.
CO3: Construe the protocols used in radiation therapy.
CO4: Interpret the radiological imaging techniques.
CO5: Describe the different scanning techniques like MRI and CT.

Mapping of COs with PSOs & POs:

Semester: IV	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		1	2				3	3	3	2	3	22
CO2	2	3		1	2	3			3	3	3	2	3	25
CO3	2	3		1	0	3			3	3	3	2	3	23
CO4	3	3		1	2	3			3	3	3	2	3	26
CO5	3	3		1	2				3	3	3	2	3	23
Grand total of COs with PSOs and POs														119
Mean value of COs with PSOs and POs=$\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}=\left(\frac{119}{47}\right)$														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	**COs of Medical Physics Strongly related with PSOs and POs**		

Arul Anandar College (Autonomous), Karumathur
Department of Physics

Class	: M.Sc. Physics	**Part**	: Core
Semester	: III & IV	**Hours**	: 180
Code	: 22PPYD14	**Credits: 8**	

PROJECT WORK
(For Students admitted from the Academic Year 2022-2023 onwards)

Course Objectives:
➢ To acquire the basic knowledge in the respective field of research.
➢ To identify a suitable theoretical or experimental model in the field of interest.
➢ To analyze and interpret the observations for getting suitable solution to the research problem.

Each candidate has to submit a dissertation on any topic in physics after collecting materials and working out the details during the IV semester. It may be a theoretical work or an experimental work or even a compilation of material of current interest from literature.

The dissertation is evaluated by internal and external examiners with viva on the project work

Course Outcomes

On completion of the course, students should be able to

CO1: Acquire the knowledge in the respective field of research.
CO2: Collect the related literature from the available online and offline sources.
CO3: Design a theoretical or experimental model in their field of interest.
CO4: Analyse the observations for getting suitable solution to the research problem.
CO5: Write a dissertation in the approved format in view of writing research articles.

Mapping of COs with PSOs & POs:

SEMESTER III&IV	Subject Code:22PPYD14								Title of Paper: Project Work					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			2	3	3	2	3	28
CO2	3	3		1	3	2			3	2	3	3	3	26
CO3	3	3		3	3	1			3	2	3	3	3	27
CO4	3	3		3	3	2			3	3	3	3	3	29
CO5	3	3		1	2	3			3	3	3	3	3	27
Grand total of COs with PSOs and POs														137
Mean value of COs with PSOs and POs=$\frac{Grand\ total\ of\ COs\ with\ PSOs\ and\ POs}{Number\ of\ COs\ relating\ with\ PSOs\ and\ POs}=$ $\left(\frac{137}{50}\right)$														2.74

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			2.74
Observation	**COs of Project Work Strongly related with PSOs and POs**		

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ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF PHYSICS - M.Sc. (PHYSICS) SYLLABUS
(2022 – 23 ONWARDS)

QUESTIONS PAPER PATTERN (External exam)

Section A:
Answer all the questions (MCQ)   10 x 1=10
(Each unit carry 2 questions)

Section B:
Either or Choice – Short answer question   (5)   5 x 6 =30
(2/3 problems may be asked)
(One question from each unit)

Section C:
Either or Choice – Long answer question   (5)   5 x 12 =60

                                                                 _____
                                                                 Total = 100

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF PHYSICS - M.Sc. (PHYSICS)
SYLLABUS
(2023 – 23 ONWARDS)

MARK ALLOTMENT FOR PROJECT WORK

Internal

Literature survey &Seminar presentations	20
Theory or Experiment	20
Preparation of dissertation	10

External

Viva-voce	50

_____

Total = 100

QUESTIONS PAPER PATTERN (Internal exam)

Section A:
Answer all the questions (MCQ)   8 x 1=8

Section B:
Either or Choice – Short answer question   2x 6 =12
(One problem may be asked)

Section C:
Either or Choice – Long answer question   2x 10=20

                                                    _____
                                                    Total =   40

SCHEME OF EVALUATION (Internal Marks)

Continuous Internal Assessment
Marks
Test-1   40
Test -2   40
Assignment / Seminar   20

                              Total = 100
                              ----

2. Semester Examination 100 Marks
3. Total Marks = 50% C.I.A + 50% Semester Examinations
A candidate must score a minimum of 25 marks out of 50 in the semester examination and an overall aggregate minimum of 50 marks out of 100 for a pass.

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.

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

PART	Sub. Code	PAPER	Hrs	Cr
I SEMESTER				
I	22UTAL11/ 22UHNL11/ 22UFNL11	Tamil / Hindi / French	6	4
II	22UENA11	English through Prose & Short Story (Stream-A)	5	4
	22UENB11	English through Prose & Short Story (Stream-B)		
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	Allied Biochemistry-I/	3/	3/
	22UMAB11	Allied Mathematics-1	5	4
	19UCHQ12	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	--
V	22UNSS/NCC/ YRC/PHY.EDU. /ROT/ACF/NC B12	Extension Activities NSS / NCC/Phy. Edn/ YRC/ROTARACT/AICUF/NATURE CLUB	--	--
	22UBRC11	Bridge Course		1
		Total	**30**	**20/21**
II SEMESTER				
I	22UTAL22/ 22UHNL22/ 22UFNL22	Tamil / Hindi / French	6	4
II	22UENA22	English through Prose & Poetry (Stream-A)	5	4
	22UENB22	English through Prose & Poetry (Stream-B)		
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	Allied Biochemistry-II/	3	3
	22UMAB22	Allied Mathematics-II	5	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
	22UFCE22	FC-Social Analysis and Human Rights	1	1
V	22UNSS/NCC/	Extension Activities NSS / NCC/Phy. Edn/	---	1

	YRC/PHY.EDU. /ROT/ACF/ NCB12	YRC/ROTARACT/AICUF/NATURE CLUB		
	22UCSH12	Communication Skills	1	1
		Total	**30**	**26/25**
		III SEMESTER		
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		---
			30	**20**
		IV SEMESTER		
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
	22UCHC44	Core-4 Physical Chemistry-I	6	6
III		Core Lab-II Inorganic Qualitative Analysis	3	3
	22UCHA24	Allied Chemistry-II (for Physics)		
		Allied Chemistry Lab (for Physics)		
		Allied-4 Physics	3	3
		Allied Physics Lab	2	2
IV	22UCHN24	Basic Tamil/Advanced Tamil/Non-Major Elective-2 Applied Chemistry	3	2
	22UFCH44	Bioethics, Religions and Peace Studies/ Catechism of the Catholic Church	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
			30	**27**

		V SEMESTER		
III	22UCHC55	Core-5 Organic Chemistry-II	6	6
	22UCHC65	Core-6 Inorganic Chemistry-II	6	5
	22UCHC75	Core-7 Physical Chemistry-II	5	5
	22UCHP35	Core Lab-III Organic Analysis	4	3
	22UCHP46	Core Lab-IV Organic Estimation & Preparation	4	3
	22UCHE15	Elective-1 (out of four)	4	3
	22UINT15	Internship (Holidays)		1
	22USSI16	Interview & Group Discussion Skills	1	1
			30	**26**
		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	6	5
	22UCHP46	Core Lab-V Gravimetry and Preparation	4	3
	22UCHP56	Core Lab-VI Physical Chemistry	4	3
	22UCHE26	Elective-2 (out of four)	4	3
	22USSI16	Leadership & Team Building Skills	1	1
			30	**25**

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 : Applied Chemistry

Semester:	I	II	III	IV	V	VI	TOTAL
Credits :	20/21	26/25	20	27	26	25	144*

* 144 credits from 2021-2022 onwards

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF CHEMISTRY
ORGANIC CHEMISTRY-I
(For students admitted from the Academic Year 2021-2022 onwards under the OBE Pattern)

Class	: II B.Sc. Chemistry	Part	: III Core -3
Semester	: III	Hours	: 90
Subject Code	: 22UCHC33	Credits	: 6

Course Educational Objectives

The course enables the students to
1. discuss the preparation and properties of alkanes & cycloalkanes.
2. discuss the preparation, properties of alkenes, alkadienes & alkynes.
3. identify the aromatic nature of organic compounds and predict their directing properties.
4. discuss the preparation, properties of alkyl and aryl halides
5. identify the relationship between phenols, alcohols and ethers in reactions.

SYLLABUS

Unit I: Alkanes and Cycloalkanes   (18 Hours)
Nomenclature of alkanes – Preparation of alkanes - Reduction of alkenes and alkynes -Wurtz reaction - Kolbe's reaction - Corey-House reaction - decarboxylation reactions. Properties of Alkanes - Physical properties - Chemical Properties – Free radical reactions, catalytic cracking, isomerization, aromatization.
Cycloalkanes – Preparation-Wurtz reaction -Dieckmann's ring closure reaction - reduction of aromatic hydrocarbons. Stability of Cycloalkanes - Baeyer's strain theory and its Limitations.
Conformations of ethane and butane – comparison of stability of various conformers - conformation of cyclohexane (chair and boat form) – axial and equatorial hydrogen.

Unit II :   Alkenes, Alkadienes and Alkynes   (18 Hours)
Alkenes: Nomenclature - methods of preparation – dehydration of alcohols and dehydrohalogenation of alkyl halides-dehalogenation of dihalides.Reactions of alkenes. Addition reactions – hydrogenation. Addition of halogens and hydrogen halides-Markownikov's rule and peroxide effect-Hydration – Hydroboration – ozonolysis – polymerization.
Alkadienes: Nomenclature and classification-Stability of conjugated dienes. Preparation and reactions of 1, 3-butadiene – 1,2- and 1,4-addition-Diels-Alder reaction.
Alkynes: Nomenclature-Structure of acetylene-methods of preparation-Acidity of terminal alkynes. Reactions of alkynes: addition of hydrogen, hydrogen halides and water.

Unit III: Aromatic Hydrocarbons   (18 Hours)
Nomenclature of aromatic compounds (mono and di-substituted compounds) - Structure of benzene: Kekule structure-Resonance picture of benzene.
Aromaticity and Huckel's rule. Elements of aromaticity, non-aromaticity and anti-aromaticity of simple molecules.
Preparation and properties of Benzene - Electrophilic aromatic substitution reactions – General mechanism. Mechanism of Nitration, sulphonation, halogenation and Friedel-Craft's reactions (Alkylation and Acylation reactions).
Disubstitution in benzene. Directive influence – classification of substituents – o,p- and meta- directing groups. Effect of substituents in orientation and reactivity.

Unit IV: Alkyl and Aryl Halides (18 Hours)

Alkyl Halides – Nomenclature and classification. Preparation of alkyl halides -Physical and chemical properties – Substitution reactions – S_N1 and S_N2 - Mechanism and stereochemistry – Factors affecting S_N1 and S_N2 reactions – comparison between S_N1 and S_N2 reactions. Elimination reactions - E_1 and E_2 reactions (Saytzeff and Hoffman rule).

Preparation – properties of allyl chloride – allylic substation using NBS (mechanism not required) – Preparation and properties of vinyl chloride.

Aryl Halides – Preparation, properties of chlorobenzene. Mechanism of nucleophilic aromatic substitution – S_NAr mechanism – Aralkyl halides - Preparation, properties of benzyl chloride. Distinction between nuclear and side-chain halides.

Unit V: Alcohols, Phenols and Ethers (18 Hours)

Alcohols: Nomenclature-Classification of alcohols- methods of preparation-chemical reactions of alcohols. Distinction between primary, secondary and tertiary alcohols – Lucas's test – oxidation method – dehydrogentation method – Victor Meyer's method.

Preparation and properties of allyl alcohol, ethylene glycol and glycerol.

Phenols: Nomenclature-Methods of preparation- Effect of substituent on the acidity of phenols. Reactions of Phenols- Lederer-Manasse reaction, Houben-Hoesch reaction, Libermann Nitroso reaction. Mechanism of Kolbe's reaction. Reimer-Tieman reaction and Gattermann reaction.

Ethers. Preparation – Dehydration of alcohols and Williamson Synthesis - Properties of ether – Formation of peroxide – Reaction with HI (hot and cold condition). Estimation of alkoxy group by Zeisel's method.

Course Outcomes

At the end of the course, the students will be able to

	Course Outcome	Knowledge Level
CO1	Explain the preparation and properties of alkanes and cycloalkanes and predict the stability of cycloalkanes	K2 & K3
CO2	Explain the preparation, properties of alkenes, alkadienes and alkynes	K1
CO3	Identify the aromatic nature of organic compounds and predict their directing properties.	K2 & K3
CO4	Compare and contrast the preparation, properties of alkyl and aryl halides and predict their mechanism	K2 & K3
CO5	Distinguish the acidity phenols, alcohols and ethers and examine their reaction	K2 & K3

Books for Study

1. B.S. Bahl and Arun Bahl, Text Book of Organic Chemistry, 22nd Edition. Chand (2017).
2. Raj K. Bansal, A Textbook of Organic Chemistry, 6th Edition, New Age International Publisher (2016).
3. P.L. Soni and H.W. Chawla, Text Book of Organic Chemistry, 21th Edition. Chand and company (2014).

Books for Reference

1. Morrison and Boyd, Organic Chemistry, 7th Edition. Prentice Hall (2010).
2. I. L. Finar, Organic Chemistry: Volume 1, 6th Edition. Pearson (2012).
3. Paula Yurkanis Bruice, Organic Chemistry, 8th Edition, Pearson (2020)

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	2	3	-	-	-	1	3	2	-	19
	2	2	2	-	2	2	3	2	-	-	3	2	2	-	20
	3	2	3	2	2	-	2	2	2	-	2	2	2	-	21
	4	2	2	2	-	-	2	2	3	-	2	2	-	-	17
	5	2	2	2	-	2	2	2	2	-	-	3	-	-	17
Grand total of COs With PSOs & POs															94
Mean value of COs With PSOs & POs = 94/43															2.25

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			2.25
Observation	COs of Organic Chemistry-I is strongly related with PSOs and POs		

ALLIED CHEMISTRY-I

(For students admitted from the Academic Year 2021-2022 onwards under the OBE Pattern)

Class	: II B.Sc. Physics	Part	: III Allied-3
Semester	: I	Hours	: 45
Subject Code	: 22UCHB13	Credits	: 5

Course Educational Objectives

The course aims to make the students to

- State the periodic law and explain the periodicity of elements
- Describe basic concepts in chemical bonding
- Explain the rates of chemical reactions, order and its determination
- State the principle involved in volumetric analysis
- Define the safety methods in the laboratory

SYLLABUS

Unit I   Periodic Table   (9 hours)

Mendeleev's periodic table - merits and demerits. Long form of the periodic table. Classification into s, p, d and f-block elements.

periodic variation-electronic configuration Atomic radius, ionic radius, ionization energy – factors affecting ionization energy, electron affinity, electronegativity-Applications of electronegativity Metallic Bond: Semiconductors – Intrinsic and Extrinsic, n and p- type super conductors.

UNIT II   Chemical Bonding   (9 hours)

Ionic bond, characteristics of ionic compounds-Covalent bond: Fajan's rule - concept of hybridization, geometry of molecules – CH_4, $BeCl_2$, BF_3, C_2H_2. Molecular Orbital Theory: LCAO, Bonding, anti-bonding orbital and bond order. MO diagrams of H_2, He_2, N_2, O_2 and F_2 molecules.

UNIT III   Chemical Kinetics and catalysis   (9 Hours)

Rate, order, molecularity, pseudo first order, determination of order. Half lifeperiod. Derivation of rate constant for first and second order reactions (same type of reactants only). Effect of temperature on the rate – Arrhenius equation. Energy of activation Catalysis: Types of catalysis – homogeneous and heterogeneous catalysis (preliminary ideas).

UNIT IV   Titrimetric Methods   (9 hours)

General principle of titrimetric methods of analysis – requirements – expressing concentration – molarity, molality, normality, Wt%, ppm.

Standardisation of solutions-Limitations of volumetric analysis – end point and equivalence point, weak acid – weak base – indicators – choice of indicators.

UNIT V   Safety Methods in Lab   (9 hours)

Storage and handling of chemicals – handling of toxic and poisonous chemicals, General precautions, first aid techniques - acid and alkali on eye - acid and alkali burn – bromine burns – cut by glasses - heat burns - Inhalation of toxic vapours – Precautions and first-aid procedure. Uses of different glassware – Hazard symbols – Laboratory safety measures – Waste and fume disposal.

Course Outcomes

At the end of the course, the students will be able to

	Course Outcome	Knowledge level
CO1	state the periodic law and explain the periodicity of elements	K2&K3
CO2	describe the basic concepts of chemical bonding	K2&K3
CO3	assess the rates of chemical reactions, order and its determination	K2&K3
CO4	state the principle followed in titrimetric methods of analysis	K2
CO5	define the safety methods in the laboratory	K2&K3

Textbooks

1. A Text Book of Physical Chemistry, Arun Bahl, B.S. Bahl., S. Chand & Co (2019).
2. Principles of Inorganic Chemistry, B.R. Puri, L.R. Sharma, & K.C. Kalia, Milestone Publishers (2017).
3. Principles of Physical Chemistry, B.R. Puri & L.R.Sharma & M.S.Pathania, Vishal Publishing Co (2018).

Books for Reference

1. R. D. Madan, "A Textbook of Modern Inorganic Chemistry", S.Chand & Co (2008).
2. Elements of Analytical Chemistry, R. Gopalan, P.S. Subramanian and K. Rangarajan, Sultan Chand & Sons. (2011).

Mapping

Objectives		PSO					PO								Sum of COs With PSOs & Pos
Outcome		1	2	3	4	5	1	2	3	4	5	6	7	8	
CO	1	3	2	2	2	-	3	2	2	2	-	2	2	-	22
	2	2	3	2	2	-	2	2	2	3	2	1	-	-	21
	3	2	2	-	2	2	2	2	3	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															101
Mean value of COs with PSOs & POs = 112/53															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 Allied Chemistry-I is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF CHEMISTRY
NON MAJOR ELECTIVE: CHEMISTRY IN YOUR LIFE
(For students admitted from the Academic Year 2021-2022 onwards under the OBE Pattern)

Class	: II B.A. History, Economics, RDS and Philosophy	Part	: IV NME-1
Semester	: III	Hours	: 45
Subject Code	: 22UCHN13	Credits	: 2

Course Educational Objectives

The course enables the students to
1. recognise the composition of air, water, and food.
2. recall composition of water
3. recognise composition of food
4. compare the properties of hair dyes
5. describe the preparation and properties of plastics

SYLLABUS

Unit I: Air (9 hours)
Composition of air – Role of various components present in air – Biological importance of oxygen – Air pollution – acid rain, ozone depletion, green house gases and green house effect.

Unit II: Water (9 hours)
Importance of water – Natural water – Sources of water – Drinking water – making water fit to drink – chlorination – Water pollution – Chemicals causing water contamination – contamination by fertilisers, soaps and detergents and their effect.

Unit III: Nutrients & Medicines (9 hours)
Important nutrients – carbohydrates, fats, proteins – their role in human health – Role of vitamins, minerals – iron, calcium, cobalt in human health – Medicines: Antibiotics, Analgesics, Antipyretics, Antidepressants – definition – few examples.

Unit IV: Fireworks & Cosmetics (9 hours)
Firework – Chinese invention – Basic ingredients and principle of firework – Colour of firework.
Perfumes – basic composition – Fragrances – Substances that give colour – Dyes – Hair dyes and hair colouring – Safety of hair dyes.

Unit V: Polymers (9 hours)
Definition – Classification – Applications – Teflon, Polythene, PVC, Polystyrene, Nylon.
Plastics – Definition – Thermo and thermosetting plastics – Bakelite and its uses

Text Book

1. Lakshmi, S. *Pharmaceutical Chemistry*, S. Chand and Sons, New Delhi, 1995.
2. A.K. De, *Environmental Chemistry*, New Age International Publishers, 2018.

Reference Books

1. Principle of Environmental Science, Cunninggham, W and Cunninggham, M.A., Tata McGraw Hill Publication, New Delhi, 2nd edition (2003)
2. P.L. Soni and H.M. Chawla, Text Book of Organic Chemistry, 28th Edition. Sultan Chand (2006)

Course Outcomes (CO)

At the end of the course, the student should be able to:

	Course Outcome	Knowledge Level
CO1	Explain the composition of air and air pollution.	K2
CO2	Explain the composition of air and air pollution	K2
CO3	Discuss various uses of nutrients and medicines for human health.	K2
CO4	Narrate the basic principles of fireworks and perfumes.	K1,K2
CO5	Define and classify the various polymers & plastics and their applications.	K1 & K2

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	-	3	2	-	-	2	2	-	-	16
	2	3	2	-	2	-	2	3	-	-	1	2	-	-	15
	3	2	2	-	1	-	2	2	-	-	2	2	-	-	13
	4	2	2	-	2	-	2	2	-	-	1	2	-	-	13
	5	2	2	-	2	-	2	2	-	-	2	2	-	-	14
Grand total of COs With PSOs &POs															71
Mean value of COs With PSOs & POs = 71/35															2.03

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 PSOs & POs			2.03
Observation	COs of Chemistry in Your Life is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF CHEMISTRY
SELF LEARNING COURSE: FORENSIC CHEMISTRY

(For students admitted from the Academic Year 2021-2022 onwards under the OBE Pattern)

Class	: II UG	Part	: Self Learning Courses
Semester	: III	Hours	: 45
Subject Code	: 22UCHSL3	Credits	: 02

Objectives

The course enables the students to
1. recall the various types of chemicals in chemical toxicology.
2. describe crime detection, bomb detection, metal detection and bullets.
3. identify forgery documents and signature by uv rays, fake currency notes, counterfeit coin, purity of gold and diamond.
4. describe the tool marks, paints, fibres and biological substances
5. discuss the scheduled drugs, steroid consumption, plastic surgery and metabolite.

SYLLABUS

Unit I   Chemical Toxicology

Poisons. Types and classification. Diagnosis of poisons in the living and the dead. Clinical symptoms. Heavy metal contamination of sea foods. Use of neutron activation analysis in detecting arsenic in human hair.

Unit II   Crime Detection

Explosives. Bomb detection. Metal detectors and other security devices. Composition of bullets and detecting powder burns.

Unit III   Forgery and Counterfeiting

Documents. Different types of forged signatures. Use of UV rays. Comparison of type written letters. Checking silver line and water mark in currency notes. Alloy analysis using Atomic Absorption Spectroscopy to detect counterfeit coins. Detection of gold purity. Diamond checking.

Unit IV   Tracks and Traces

Tracks and traces. Casting of foot prints. Residue prints. Tyre patterns. Glass fracture. Tool marks. Paints. Fibres. Analysis of biological substances.

Unit V   Medical Aspects

Misuse of scheduled drugs. Burns and their treatment by plastic surgery. Metabolite analysis. Detecting steroid consumption among athletes.

Text Book

1. Nanda and Tewari – Forensic Science in India A Vision for the 21st Century, Select Publisher, 2001.

Reference Books

1. T. H. James, Forensic Sciences. Stanley Thames Ltd. (2000)
2. Richard, An Introduction to Forensic Science. 8th Edition, Prentice Hall, (2004).
3. Nabar B S, Forensic Science, SVP national police academy, Hyderabad.
4. Eckert G. William – Introduction to Forensic Sciences, CRC Press, Second Edition
5. Saferstein Richard, Criminalities – An Introduction to forensic science, Prentice Hall, 5th Edition.

Course Outcomes (CO)

At the end of the course, the student should be able to:

	Course Outcome	Knowledge Level
CO1	List out and recognize the poisonous chemicals and detecting instruments	K1 & K2
CO2	Define and Identify the metal detector	K1 & K2
CO3	identify the testing for forgery signature	K1,K2
CO4	Compare and distinguish tool marks	K2
CO5	Identify the steroid consumption in athletles	K2

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	-	3	2	-	-	1	2	-	-	15
	2	3	2	-	2	-	2	2	-	-	1	2	-	-	14
	3	2	2	-	1	-	2	3	-	-	2	2	-	-	14
	4	2	2	-	2	-	2	2	-	-	2	2	-	-	14
	5	2	2	-	2	-	2	2	-	-	2	2	-	-	14
Grand total of COs With PSOs & POs															71
Mean value of COs With PSOs & POs = 71/35															2.03

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			2.03
Observation	COs of Forensic Chemistry is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF CHEMISTRY
B.Sc. Chemistry: Core – 4
PHYSICAL CHEMISTRY-I
(For students admitted from the Academic Year 2021-2022 onwards under OBE Pattern)

Class	: II B.Sc. Chemistry	Part	: III Core -4
Semester	: IV	Hours	: 90
Subject Code	: 22UCHC44	Credits: 6	

Course Educational Objectives

The course enables the students to

1. compute the molecular velocities, explain the properties of real gases and derive the expression of real gases.
2. illustrate various terminologies and concepts related to first and Zeroth law of thermodynamics and thermochemistry
3. discuss the feasibility of chemical reactions based on II law of thermodynamics
4. state and discuss third law of thermodynamics &apply the concepts of chemical equilibrium
5. derive and solve problems related to various ionic equilibrium properties along with its applications

SYLLABUS

Unit I   Gaseous State   (18 Hours)

The kinetic theory of gases –Maxwell distribution of molecular speeds and energies - Molecular velocities – Most probable, root mean square and average velocities - Collision parameters – mean free path – degrees of freedom of a molecule – principle of equipartition of energy - Deviations from ideal behavior – equation of states for real gases – Vander Waals equation of state – intermolecular forces - the critical phenomena – P-V isotherm of carbon dioxide – the Vander Waals equation and critical states – Principle of corresponding states.- liquefaction of gases.

Unit – II   First law of thermodynamics and Thermochemistry   (18 Hours)

Importance of Thermodynamics -Terminology in thermodynamics -Types of system – state variable – Thermodynamic equilibrium – Extensive and Intensive properties –First law of thermodynamics – Internal energy -State and path functions. Enthalpy – enthalpies of vaporization and fusion. Heat Capacity - Relation between C_p and C_v– Joule-Thomson effect & Joule-Thomson coefficient and its significance.
Zeroth law of thermodynamics – Absolute temperature scale.

Thermochemistry – Change in enthalpy in chemical reaction –enthalpy of neutralization – enthalpy of formation – Bond energy and heat of reaction – Variation of enthalpy of reaction with temperature – Kirchhoff equation – Hess law and its applications.

Unit – III   Second law of thermodynamics   (18 Hours)

Limitations of first law of thermodynamics – Formulation of second law of thermodynamics on the basis of Carnot cycle – Efficiency of a heat engine – The concept of entropy –Entropy changes in reversible and irreversible processes – Entropy of mixing – Entropy change in a chemical reaction - Work function – Gibbs free energy – Helmholtz free energy – Maxwell's relationship - Criteria of spontaneity - Gibbs-Helmholtz equation – Concept of chemical potential - Gibbs-Duhem equation - Clapeyron-Clausius equation –Integrated equation and applications.

Unit – IV   Third law of Thermodynamics and Chemical Equilibrium   (18 Hours)

Third law of thermodynamics: Nernst heat theorem - Formulation of third law. Determination of absolute entropy of solids.

Free energy of spontaneous reaction – Standard free energy change - Law of mass action - K_p and K_c – Relationships between K_p and K_c - Properties of equilibrium constants – Derivation of Kp and Kc for homogeneous equilibria - HI formation and Dissociation of PCl_5 – Temperature dependance of the Equilibrium constant – The van't Hoff equation – Derivation of Kp and Kc for heterogeneous equilibria - Le-Chatelier's principle – Contact Process and Haber's process.

Unit –V   Ionic Equilibria   (18 Hours)

Dissociation of weak acids and bases – Dissociation of water – Ionic product of water – The pH scale – Relationship between pH and pOH – Numerical problems involving pH – Common ion effect – Buffer solution – Henderson's equation – Mechanism of buffer action. Hydrolysis of salts – Salts of strong acids and strong bases – Salts of weak acids and strong bases – Salts of weak bases and strong acids – Salts of weak acids and weak bases -Degree of hydrolysis - Relation between K_h, K_a, K_b, K_w. Concept of solubility product – Solubility product of sparingly soluble salts – Applications.

Text Book

1. Puri, Sharma and Pathania, Principles of Physical Chemistry, 48th Edition*,* Vishal Publishing & CO (2020).
2. A.S. Negi, S.C. Anand, A Textbook of Physical Chemistry, 3rd Edition, New Age International Publisher (2022).
3. Arun Bahl, BS Bahl, G.D. Tuli, Essentials of Physical Chemistry, 28th Edition, S. Chand Publishers (2020).

Reference Book

1. R. Gurdeep Chatwal, Advanced Physical Chemistry, Joel publishing house (2016).

2. K.L. Kapoor, A Textbook of Physical Chemistry - Application of Thermodynamics, Vol 3, 5th Edition, McGraw Hill (2020).
3. G. Rajaram, J.C. Kuriacose, Thermodynamics, New edition, Shoban Lal Nagin Chand and Co (2006).

Course Outcomes (CO)

At the end of the course, students are enabled to

	Course Outcome	Knowledge Level
CO1	Compute the molecular velocities, explain the properties of real gases and derive the expression of real gases.	K2 & K3
CO2	Illustrate various terminologies and concepts related to first and zeroth law of thermodynamics and Thermochemistry	K1, K2 & K3
CO3	discuss the feasibility of chemical reactions based on II law of thermodynamics	K3
CO4	state and discuss third law of thermodynamics &apply the concepts of chemical equilibrium	K1 & K2
CO5	Derive and solve problems related to various ionic equilibrium properties along with its applications	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	3	2	2	2	2	3	2	-	-	-	2	2	2	21
	2	2	2	3	3	2	2	2	-	-	-	2	2	2	20
	3	2	2	2	2	2	2	2	-	-	-	2	2	2	20
	4	3	2	2	2	2	2	2	-	-	-	2	2	2	21
	5	3	3	2	2	2	3	2	-	-	-	2	2	2	23
Grand total of COs with PSOs & POs															105
Mean value of COs with PSOs & POs = 105/50															2.1

Mapping Scale	1	2	3
Relation	0.01-1.0	1.01-2.0	2.01-3.0
Quality	Low	Medium	Strong
			2.1
Observation	COs of Physical Chemistry-I is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF CHEMISTRY
B.Sc. Chemistry: Allied-2
ALLIED CHEMISTRY-II
(For students admitted from the Academic Year 2021-2022 onwards under the OBE Pattern)

Class	: II B.Sc. Physics	Part	: III Allied-4
Semester	: IV	Hours	: 45
Subject Code	: 22UCHA24	Credits	: 3

Course Educational Objectives

The course enables the students to
1. state the theory of photochemical processes
2. identify Structure and bonding in coordination compounds
3. explain the preparation and reactions of amino acids and carbohydrates
4. describe the principles of chemical energetics, relation between heat and work and the concept of free energy
5. explain the electrolytic conductance and electrochemical cells

SYLLABUS

Unit I   Fundamentals of Photochemistry   (9 hours)
Definition- Grothus Draper Law and Einstein's Law, Beer-lamberts law Quantum Efficiency (High and Low). Jablonski diagram. Comparison between thermal and photochemical reactions. Chemiluminescence, Fluorescence, Phosphorescence. Bioluminescence, Photosensitisation (Definitions with suitable examples)

Unit II   Coordination Chemistry   (9 hours)
Double salts – complex compounds – complex ion and coordination number Ligands and their classification. Werner's theory. Chelation- EDTA and its applications in analysis.
Valence Bond Theory and its applications (Tetrahedral and Octahedral). Limitations of VBT. Isomerism: ionization, hydrate, ligand, linkage, coordination, position, geometrical and optical isomerisms.

Unit III   Basic concepts in Organic Chemistry   (9 hours)
General Introduction- Functional groups-Structural Formulae (Fundamental ideas only). Isomerism- – Structural and stereoisomerism – types and examples. Cleavage of bonds- Homolysis and Heterolysis. Types of reagents –Electrophiles, nucleophiles and free radicals– definition and examples. Organic reactions – Types of reactions (addition, elimination, substitution, rearrangement)

Unit IV   Thermodynamics   (9 hours)
Energetics – Definition of first law thermodynamics – Types of systems – types of equilibrium Reversible, irreversible, Isothermal and adiabatic processes. Joule-Thomson effect. Enthalpy – enthalpy of fusion – enthalpy of vaporization- Need for the second law – Entropy and its significance – Free energy change in a chemical reaction – bond energy – Spontaneous processes – Criteria of spontaneity of chemical reaction.

Unit V   Electrochemistry   (9 hours)

Faraday's Law of electrolysis, specific, molar and equivalent conductance and its variation with dilution. Kohlrausch's law- Daniel cells- reference electrodes. Electrochemical series and its applications – pH determination. Conductometric titrations – Buffer and its action.

Course Outcomes

At the end of the course, the students will be able to

	Course Outcome	Knowledge Level
CO1	explain the theories of photochemistry and describe Jablonski diagram	K1 & K2
CO2	define the basic concepts and theories of coordination chemistry	K1
CO3	classify and explain the properties as well as the importance of carbohydrates, proteins, aminoacids	K2
CO4	illustrate the principles, applications of thermodynamics	K2
CO5	depict the basics of electrochemistry	K2

Textbook

1. A Text Book of Organic Chemistry, Arun Bahl, B.S. Bahl., S.Chand & Co, 22nd Edition, (2019).

Books for Reference

1. Principles of Inorganic Chemistry, B.R.Puri, L.R.Sharma, & K.C. Kalia. Vishal Publishing Co (2020).
2. Principles of Physical Chemistry, B.R. Puri & L.R. Sharma & M.S. Pathania. Vishal Publishing Co (2021).

Mapping

Objectives		PSO					PO								Sum of COs With PSOs & POs
Outcome		1	2	3	4	5	1	2	3	4	5	6	7	8	
CO	1	3	2	2	2	-	3	2	2	-	2	2	2	2	24
	2	2	2	2	-	2	3	2	2	2	-	2	2	2	23
	3	3	2	2	-	2	2	2	-	2	2	-	2	2	21
	4	2	3	2	-	2	2	2	2	-	2	2	2	2	23
	5	2	2	2	2	-	2	3	2	-	-	2	2	2	21
Grand total of COs with PSOs & POs															112
Mean value of COs with PSOs & Pos = 112/53															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 Allied Chemistry-II is strongly related with PSOs and POs		

DEPARTMENT OF CHEMISTRY
NON-MAJOR ELECTIVE: APPLIED CHEMISTRY
(For students admitted from the Academic Year 2021-2022 onwards under OBE Pattern)

Class	: II B.Sc. RDS, Mathematics & Physics	Part :	NME-2
Semester	: IV	Hours :	45
Subject Code	: 22UCHN24	Credits :	2

Course Educational Objectives

The course enables the students to
1. Recognize the nutrients and medicine for good health
2. Determine the role of nucleic acid and hormones in human.
3. List out the important polymers and their uses.
4. Discuss the cosmetic products
5. List out the important of chemical aspects of soil

SYLLABUS

Unit I: Nutrients & Medicines (9 hours)
Important nutrients – carbohydrates, fats, proteins – their role in human health – Role of vitamins, minerals – iron, calcium, cobalt in human health – Medicines – Antibiotics, Analgesics, Antipyretics, Antidepressants- definition - few examples.

Unit II: Nucleic acids (9 hours)
Nucleic acids – Elementary idea on the structure of DNA and RNA – their role – Hormones in our body – Functions and deficiency symptoms.

Unit III: Polymers (9 hours)
Definition. Classification – Applications – Teflon, Polythene, PVC, Polystyrene, Nylon. Plastics – Definition – Thermo and thermosetting plastics – Bakelite and its uses.

Unit IV: Cosmetics (9 hours)
Shampoos – principal constituents – thickeners and foam stabilizers – perfumes – preservatives – conditioning agents – antidandruff shampoos. Hair cream – composition – hair dyes – types – constituents – dye removals.

Unit V: Chemistry of soil & Plant Nutrients (9 hours)
Composition of soil - Organic and Inorganic constituents. - Chemical aspects of soil - acid, alkali and saline soil. Plant nutrients - Sources and roles of macro and micro nutrients in plant growth – Nutritional deficiency in plants - symptoms, corrective measures.

Text Books

1. P. L. Soni, H.M. Chawla, Textbook of Organic Chemistry, Sultan Chand & Sons, (2014)

2. Modern Technology of Cosmetics, Asia Pacific Business Press Inc., New Delhi, (2014)

Reference Books

1. B. R. Puri, L. R. Sharma & K. C. Kalia, Principles of Inorganic Chemistry, Vishal Publishing Co. (2020)
2. Jayashree Ghosh, A Textbook of Pharmaceutical Chemistry, S. Chand Publishing, (2010)
3. H. Kaur, Environmental Chemistry, Pragati Prakashan Publishers, Meerut (2016)
4. S. S. Dara & D. D. Mishra, A Text Book of Environmental Chemistry and Pollution Control, S. Chand & Company, New Delhi (2011)

Course Outcomes (CO)

At the end of the course, the student should be able to:

No.	Course Outcome	Knowledge Level
CO 1	discuss the various uses of nutrients and medicines for human health.	K2
CO 2	interpret the role of nucleic acid and hormones in human body	K2
CO 3	define and classify the various polymers and its applications.	K1
CO 4	discuss various use of shampoos and hair dyes	K2
CO 5	define and analyse the chemistry of soil	K1 & K2

Mapping

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	-	2	3	-	-	2	2	-	-	16
	2	2	3	-	2	-	3	2	-	-	2	2	-	-	16
	3	2	1	-	2	-	3	2	-	-	2	2	-	-	14
	4	2	2	-	1	-	2	3	-	-	2	2	-	-	14
	5	1	2	-	2	-	2	2	-	-	2	1	-	-	12
Grand total of COs With PSOs & POs															
Mean value of Cos With PSOs & POs = 72/35															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 Applied Chemistry is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF CHEMISTRY
SELF LEARNING COURSE: FOOD CHEMISTRY
(For students admitted from the Academic Year 2021-2022 onwards under the OBE Pattern)

Class	: II UG	Part	: Self Learning Courses
Semester	: IV	Hours	:
Subject Code	: 22UCHSL4	Credits	: 03

Course Educational Objectives

The course enables the students to
1. define the information food and food sources
2. illustrate about the food additives
3. describe awareness on food adulteration
4. explain the importance of quality of food
5. identify the recent food technology process

SYLLABUS

Unit-I   Food and Food Sources
Food: Definition - Classification based on nutritional values, nutritive values of cereals and nuts - oil seeds. Milk - composition of milk, water present in milk, milk protein and milk sugar. Food Sources, biological functions, deficiency diseases and Recommended Dietary Allowance (RDA) of carbohydrates, protein and fats.

Unit-II   Food Additives
Artificial sweeteners – saccharin, cyclomate, asparatame – food flavours – esters, aldehydes and heterocyclic compounds. Antioxidants.Foodcolors– changes in cooking. Restricted use. Baking powder – Yeast – Taste enhancers – MSG - vinegar**.** Beverages: Soft drinks, soda, fruit juices and alcoholic beverages (Types and content of alcohol). Composition of soft drinks. Illness of soft drinks (urinary bladder stones).

Unit- III   Food Adulteration
Types of adulterants- intentional, incidental and metallic. Common adulterants in different foods – milk and milk products, vegetableoils and fats, spices and condiments, cereals, pulses, sweetening agents and beverages.

Unit- IV   Food Preservation
Food Preservation: principle and importance - methods of preservation, freezing, canning, pickling, salting, smoking, bottling, sterilization, refrigeration, dehydration, heating, radiation and preservative agents – Quality control: Specifications and standards: PFA, FPO, FDA, drug license, WHO standards, ISI specifications.

Unit- V   Food Technology
Introduction to food technology and future foods – Biotechnology in food. Nutraceuticals. Organic foods. Low-cost nutrient supplements. Space foods.

Course Outcomes

At the end of the course, the students will be able to

	Course Outcome	Knowledge Level
CO1	categorize the major components of foods in the environment	K2
CO2	summarize food additives, pigments, flavoring agents and preservatives	K2
CO3	explain the awareness on food adulteration	K2
CO4	define the importance of quality of food	K1
CO5	Demonstrate the recent food technology process	K2

Text Books

1. Dr. M. Swaminathan, Handbook of food and Nutrition. The Bangalore Printing and Publishing Co.,5th Edition (2007)
2. B. Srilakshmi, Food Science. New Age International Publishers (2005)

Reference Books

1. H.K. Chopra and P.S. Panesar, *Food Chemistry*, Narosa Publisher, New Delhi (2010)
2. Jayashree Ghosh, *Fundamental concepts of Applied Chemistry*, S. Chand & Co. Publisheres (2006)
3. Partrasarathy, A. (Editor), *Chemistry of spices,* CAB International, Oxford shire, UK, (2008)

Mapping

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	-	2	3	-	-	2	2	-	-	16
	2	2	3	-	2	-	2	2	-	-	2	2	-	-	15
	3	2	1	-	2	-	3	2	-	-	2	2	-	-	14
	4	2	2	-	1	-	2	3	-	-	2	2	-	-	14
	5	1	2	-	2	-	2	2	-	-	2	1	-	-	12
Grand total of COs With PSOs & POs															71
Mean value of Cos With PSOs & POs = 72/35															2.03

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			2.03
Observation	COs of Food Chemistry is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF CHEMISTRY
B.Sc. Chemistry
INORGANIC QUALITATIVE ANALYSIS
(For students admitted from the academic year 2021-2022 onwards under the OBE pattern)

Class	: II B.Sc. Chemistry	Part	: Core Lab-2
Semester	: III & IV	Hours	: 45
Subject Code	: 22UCHP24	Credits: 3	

Course Educational Objectives

The course enables the students to
1. recall the principles of qualitative analysis
2. recognize the chemical reactions of acid and basic radicals
3. classify and find acid and basic radicals
4. analyze the inorganic salt mixture
5. separate and identify the cations into various groups

SYLLABUS

Semimicro Qualitative Analysis
1. Analysis of inorganic salt mixture containing interfering and non-interfering anions.
2. Simple anions: carbonate, nitrate, sulphate and bromide.
3. Interfering anions: borate, fluoride, oxalate and phosphate.
4. Elimination of interfering anions and intergroup separation of cations
5. Cations:

Group I	:	Lead
Group II	:	Copper, Cadmium, Bismuth
Group III	:	Aluminum, Iron, Chromium
Group IV	:	Cobalt, Nickel, Manganese, Zinc
Group V	:	Barium, Strontium, Calcium
Group VI	:	Magnesium
Zero group	:	Ammonium

Books for Study

1. Practical Chemistry by A.O. Thomas, Scientific Book Centre, Cannanore, 2003.
2. Venkateswaran, V. Veerasamy, R. and Kulandaivelu, A.R., *Basic Principles of Practical Chemistry*, Sultan Chand & Sons, New Delhi, 2017.

Books for Reference

1. V.V. Ramanujam, Inorganic Semi Micro Qualitative Analysis, 3rdedn., The National Publishing Company, Chennai, 1974.
2. G. Svehla, Vogel's Qualitative Inorganic Analysis, 7thedn., Pearson education, Chennai, 2012.
3. Jeyavarthana Samuel, Chemistry Practical Book, S.S. Printers, Chennai, 2018.
4. G. Svehla, Vogel's Qualitative Inorganic Analysis, 7thedn., Pearson education, Chennai, 2002.

Course Outcomes

	Course Outcome	Knowledge Level
CO1	recognize the methods of inorganic salt analysis	K1
CO2	explain the reactions involved in the salt analysis	K2
CO3	identify the tests for various anions and cations	K2
CO4	compare the properties of various group cations	K3
CO5	establish and conclude the importance of physical concepts (pH, solubility product, etc) in inorganic qualitative analysis	K3 & K4

MappingCourse 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	-	2	3	2	-	-	3	3	2	2	24
	2	2	3	3	-	2	2	2	-	-	2	3	2	3	24
	3	2	2	3	-	-	2	3	-	-	3	3	2	2	22
	4	2	-	2	3	-	2	2	-	-	2	3	2	2	20
	5	3	3	-	2	3	2	2	-	-	2	2	2	3	24
Grand total of COs with PSOs & POs															114
Mean value of COs with PSOs & POs = 114/48															2.38

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			2.38
Observation	COs of Inorganic Qualitative Analysis is strongly related with PSOs and POs		

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ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF CHEMISTRY
B.Sc. Chemistry: Allied Practical–2

ORGANIC QUALITATIVE ANALYSIS & VOLUMETRIC ESTIMATIONS
(For students admitted from the Academic Year 2021-2022 onwards under the OBE Pattern)

Class	: II B.Sc. Physics	Part	: III Allied Practical
Semester	: III/IV	Hours	: 30
Subject Code	: 22UCHR14	Credits: 2	

Course Educational Objectives

The course enables the students to
1. state the principles behind volumetric analysis.
2. detect error in handling apparatus for volumetric estimations
3. examine to prepare solutions of different concentration
4. identify on training in volumetric titration
5. infer the analysis of mono functional organic compound

SYLLABUS

I. VOLUMETRIC ANALYSIS:
1. Estimation of HCl (Oxalic acid – NaOH – HCl).

2. Estimation of Na_2CO_3 (NaOH – HCl – Na_2CO_3).

3. Estimation of NaOH (Na_2CO_3– HCl – NaOH).

4. Estimation of Oxalic acid (HCl – NaOH – Oxalic acid).

5. Estimation of FAS (Oxalic acid – $KMnO_4$ – FAS).

6. Estimation of Fe^{2+} ion (FAS – $KMnO_4$ – $FeSO_4$).

7. Estimation of Copper ($K_2Cr_2O_7$ – Thio – Cu^{2+})

II. ORGANIC ANALYSIS:
1. Detection of Elements.

2. To distinguish between aliphatic and Aromatic.

3. To distinguish between saturated and unsaturated.

4. Functional group tests for phenol, acid (mono), amine, monoamide, diamide, carbohydrate, aldehyde and ketone

5. Functional groups characterized by confirmatory test.

Course Outcomes

At the end of the course, the students will be able to

	Course Outcome	Knowledge Level
CO1	define and identify the terminology of concentration terms	K1 & K2
CO2	illustrate the basics principles and expression involved in volumetric estimation	K2
CO3	find the strength of acid by acidimetry	K3
CO4	find the strength of base by alkalimetry	K3
CO5	assess the mono functional organic compounds qualitatively	K3

Textbook

1. Venkateswaran, V. Veerasamy, R. and Kulandaivelu, A.R., *Basic Principles of Practical Chemistry*, Sultan Chand & Sons, New Delhi, 2017.

Book for Reference

1. Thomas, A.O, *B.Sc. Main Practical Chemistry*, Scientific Book Centre, Cannanore, 2003.

Mapping

Objectives		PSO					PO								Sum of COs With PSOs & Pos
Outcome		1	2	3	4	5	1	2	3	4	5	6	7	8	
CO	1	3	2	-	2	2	3	3	-	-	-	2	3	2	22
	2	3	2	3	2	2	2	2	-	-	-	2	2	3	23
	3	2	3	-	2	2	3	2	-	-	-	3	2	2	21
	4	2	3	2	3	2	2	3	-	-	-	2	2	2	23
	5	2	2	3	2	2	2	2	-	-	-	3	2	3	23
Grand total of Cos with PSOs & POs															112
Mean value of COs with PSOs & POs = 112/48															2.33

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			2.33
Observation	COs of Allied Chemistry practical is strongly related with PSOs and POs		

DEPARTMENT OF CHEMISTRY
ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

Programme Outcomes (POs)

After completion of this two-year programme, the students will be able to

PO1: demonstrate profound comprehension on the concepts, theories and principles in the disciplinary knowledge and appreciate its contextual significance.

PO2: conceptualise the theories, formulate decision making models and design solutions to the growing national needs together with the reflective analysis of its implications.

PO3: develop the skills of analytical reasoning and associate the relevance of the theoretical concepts in various perspectives.

PO4: critically evaluate the practical utility of translating theory into praxis and lab into land towards societal upliftment.

PO5: undertake creative research initiatives with innovative Trans-disciplinary approach for catering the contemporary needs of rural development.

PO6: empower themselves by digital, communication, programming and professional skills for a suitable career in this competitive globe.

PO7: engage in self-directed and life-long learning and elicit optimal personality by rising in leadership qualities active involvement in teamwork and collaboration with the members of the diverse cultural groups in the society.

PO8: emerge as responsible citizens with the awareness of their role in promoting environmental sustainability and gender equity together with the adsorption of ethical, social, moral and cultural values.

Programme Specific Outcomes (PSO) – M.Sc. Chemistry

The programme enables the students to

1. describe the scientific principles of Chemistry, develop an insight into a specialized subject and pursue higher studies

2. employ critical thinking and scientific knowledge to design chemical reactions, carry out, assess, analyze, interpret and draw conclusions from them

3. develop analytical skills and problem-solving skills required to develop new applications of chemistry and transform the learned skills to qualify competitive examinations

4. assess and interpret qualitative and quantitative data and empower themselves in recent and advanced developments in chemistry to undertake research and to get placements

5. create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF CHEMISTRY
M.Sc. Chemistry – Course Structure under CBCS

S.No.	Course	Code	Title of the Paper	Hours/Week	Credit
SEMESTER-I
1	Core	22PCHC11	Organic Reaction Mechanism & Stereochemistry	5	4
2	Core	22PCHC21	Chemical Bonding & Solid-State Chemistry	5	4
3	Core	22PCHC31	Quantum Chemistry and Group Theory	6	5
4	Elective-1	22PCHE11	Chemistry of Materials/ Industrial Waste Management	6	4
5	Core	22PCHP11	Organic Chemistry Practical – I	4	3
6	Core	22PCHP21	Inorganic Chemistry Practical – I	4	3
			TOTAL	30	23
SEMESTER-II
7	Core	22PCHC42	Conformational Analysis, Reagents and Organic Synthesis	5	4
8	Core	22PCHC52	Coordination, Organometallics and Bioinorganic Chemistry	5	4
9	Core	22PCHC62	Principles of Molecular Spectroscopy	6	5
11	NME	22PCHN12	Environmental Chemistry	4	3
12			Life Skills	2 (+2)	3
13	Core	22PCHP32	Organic Chemistry Practical - II	4	3
14	Core	22PCHP42	Physical Chemistry Practical – I	4	3
			Self-Learning (MOOC, NPTEL)		
			TOTAL	30	25
SEMESTER-III
15	Core	22PCHC73	Natural Products	6	5
16	Core	22PCHC83	Chemical Thermodynamics, Equilibria and Electrochemistry	6	5
17	Core	22PCHC93	Applications of Spectroscopy	5	4

17	Core Elective	22PCHE23	Research Methodology/Polymer Chemistry	5	3
18	Core	22PCHP53	Physical Chemistry Practical-II	4	3
19	Core	22PCHP63	Inorganic Chemistry Practical-II	4	3
TOTAL				**30**	**23**
SEMESTER-IV					
19	Core	22PCHD04	Analytical Chemistry	4	3
20	Core	22PCHD14	Photochemistry, Pericyclic reactions and Supramolecular Chemistry	5	4
21	Core	22PCHD24	Chemical Kinetics, Surface and Polymer Chemistry	5	4
22	Elective-4	22PCHE34	Biochemistry & Medicinal Chemistry / Green Chemistry	4	3
23	Core		Project Work	12	7
TOTAL				**30**	**21**

Semester	I	II	III	IV	Total
Credit	**23**	**25**	**23**	**21**	**92**

Natural Products
(Applicable to the students admitted from the academic year 2022-2023 onwards under
OBE Pattern)

Class : II M.Sc. Chemistry	Part : Core-7
Semester : III	Hours : 90
Code : 22PCHC73	Credits: 5

Course Educational Objectives
The course aims to make the students to
1. discuss the structural elucidation of terpenes and classify them (K2, K3)
2. classify and explain the structural determination of alkaloids (K3, K4)
3. discuss about the bile acids, sex hormones and color reactions of sterols and explain the structural determination of cholesterol (K2, K4)
4. discuss color reactions, classify flavonoids and design the synthesis of flavones, flavanones, isoflavones, chalcones and anthocyanidins (K2, K3, K5)
5. explain the metabolism, storage of carbohydrates, Glycogenesis, Glycolysis, Citric acid cycle and Pentose phosphate pathway (K3, K4)

Unit – I Terpenoids (18 hours)
Classification of terpenoids. Isoprene rule. General methods of structural determination of terpenes. Structure and synthesis of Myrcene, Zingiberene, Cadinene and Abietic acid.Biosynthesis of terpenoids.

Unit – II Alkaloids (18 hours)
Classification. General methods of structural elucidation – Hofmann Exhaustive methylation, Emde's Degradation, Zeisel's method. Structural determination and synthesis of Ephedrine, Atropine, Morphine. Structural elucidation of Reserpine (synthesis excluded). Biological importance of alkaloids.

Unit – III Steroids (18 hours)
Sterols-Introduction, Classification and Colour reactions. Isolation and structural determination of Cholesterol (synthesis excluded). Biological importance of bile acids. Structural elucidation of sex hormones – Progesterone, Androsterone, Estrone (synthesis excluded).

Unit – IV Flavonoids (18 hours)
Classification of flavonoids. Colour reactions. Change of colour with respect to pH.General methods of structural determination. Synthesis of flavones, flavanones, isoflavones, chalcones and anthocyanidins. Structure and synthesis of Apigenin,Luteolin, Quercetin and Caffeine.

Unit – V Carbohydrates (18 hours)
Classification- reducing and non-reducing – relationship between mutarotation and reducing property - Cellulose,Lignin and Pectin. Metabolism of Carbohydrates. Storage of Carbohydrates. Glycogenesis, Glycogenolysis, Gluconeogenesis. Oxidation – Glycolysis, Citric acid cycle and Pentose phosphate pathway.

Reference Books
1. Gurdeep R. Chatwal, "Organic Chemistry of Natural Products", Volume-I& II, Edited by Arora, Himalaya Publishing House (2018)
2. O.P. Agarwal, "Organic Chemistry Natural Products", Volume I& II, Krishna Prakashan Media (P) Ltd (2021)
3. V.K.Ahluwalia, "Chemistry of Natural Products", Vishal Publishing Co (2013)

4. I.L. Finar, Organic Chemistry- Vol 2 "Stereochemistry & The Chemistry of Natural Products", Pearson Education Limited(2018)
5. Stephen Stanforth, "Natural Product Chemistry at a Glance", Anebooks - Blackwell Science (2006)
6. Ashutosh Kar, "Chemistry of Natural Products", Volume 1& 2, CBS Publishers & Distributors (2018)
7. Anees A Siddiqui, "Precise Chemistry of Natural Products & Heterocyclic Compounds for Pharmacy & Science", CBS Publishers & Distributors, (2019)

Course Outcomes (COs)

On completion of the course, students will be able to

CO1: discuss the structural elucidation of terpenes and classify them.

CO2: classify and explain the structural determination of alkaloids.

CO3: discuss about the bile acids, sex hormones and color reactions of sterols and explain structural determination of cholesterol.

CO4: discuss its color reactions, classify flavonoids and design the synthesis of flavones, flavanones, isoflavones, chalcones and anthocyanidins.

CO5: explain the metabolism, storage of carbohydrates, Glycogenesis, Glycolysis, Citric acid cycle and Pentose phosphate pathway.

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	-	-	-	12
	2	3	2	-	-	-	2	2	2	-	2	-	-	-	13
	3	2	2	-	-	-	2	2	2	-	2	-	-	-	12
	4	2	3	-	-	-	3	2	2	-	3	-	-	-	15
	5	3	2	-	-	-	3	2	2	-	3	-	-	-	15
Grand total of COs with PSOs & POs															67
Mean value of COs with PSOs & POs = 67/30															2.23

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			2.23
Observation	COs of Natural Products strongly related with PSOs and POs		

Chemical Thermodynamics, Equilibria and Electrochemistry

(Applicable to the students admitted from the academic year 2022-2023 onwards under OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core-8
Semester	: III	Hours	: 90
Code	: 22PCHC83	Credits: 5	

Course Educational Objectives

The course aims to make the students to

1. derive and explain the concepts of equilibrium and non-equilibrium thermodynamics (K2, K4)

2. classify and derive the various types of statistical thermodynamics (K2, K3)

3. explain and justify the concepts behind in chemical and phase equilibria (K3, K4)

4. discuss and analyze the theories of electrochemistry (K2, K4)

5. discuss and explain the various models and process involved in electrochemistry (K2, K4)

Unit – I Equilibrium Thermodynamics and Non-equilibrium Thermodynamics

(18 hours)

General review of enthalpy, entropy and free energy concepts - second law of thermodynamics - concept of entropy - Gibbs function- Gibbs- Helmholtz equation- Maxwell relations - Third law and its limitations-Thermodynamics of systems of variable compositions-partial molar quantities and their determination - chemical potential - Gibbs-Duhem equation - Gibbs-Duhem-Margules equation - fugacity and its determination - choice of state. Third law and its limitation.

Non-equilibrium thermodynamics - conservation of mass and energy-entropy production-entropy production in chemical reactions-entropy production and entropy flow in open systems- Onsager's theory - validity and its verification.

Unit – II Statistical Thermodynamics **(18 hours)**

Combinatory rule - probability theorem - permutations and combinations - energy states and energy levels - macro-states and micro-states - Maxwell-Boltzmann statistics -Partition function and thermodynamic functions- molar partition function- entropy and third law - separation of partition function- translational, rotational, vibrational and electronic partition functions, combined partition function.

Quantum statistics - Bose-Einstein and Fermi-Dirac statistics - comparison of the three statistics- photon gas and electron gas according to such statistics- population inversion.

Unit – III Chemical and Phase Equilibria **(18 hours)**

Thermodynamic derivation of equilibrium constant for equilibrium involving ideal and real gases-Temperature dependence of the equilibrium constant-Vant-Hoff equation. principle of Le - Chatelier – and Braun – chemical equilibria.

Gibbs phase rule - its thermodynamic derivation - application of phase rule to three component systems - Formation of one pair, two pairs and three pairs of partially miscible liquids - Systems composed of two solids and a liquid.

Unit – IV Electrochemistry-I   (18 hours)

Ionic mobility - the Arrhenius ionisation theory- ionic activities and activity coefficients and their determination by various methods -ionic strength –- Debye-Huckel theory of Strong Electrolytes - ionic atmosphere – Mean ion activity and activity coefficient of electrolytes in solution - ion association Debye Huckel limiting law - electrochemical cells and applications of standard potentials. Applications of emf measurements-potentiometric titrations.

Unit – V Electrochemistry-II   (18 hours)

The electrical double layer - structure of electrical double layer - double layer models - Helmholtz, Guoy-Chapman and Sternmodels. Electrode kinetics - Butler-Volmer equation– one step one electron transfer kinetics - exchange current density - Tafel equation and plots - polarizable and non-polarizable interfaces- polarization and overvoltage – mechanism of hydrogen evolution and oxygen evolution reactions -primary and secondary batteries - fuel cells - corrosion and its prevention methods.

Reference Books

1. D. A. McQuarrie., J.D Simon, "Physical Chemistry: A Molecular Approach", University Science books (2011).
2. P. W. Atkins, J. Paula, "Physical Chemistry", Oxford Publications, 8th edition (2009).
3. J. O. M. Bockris& A. K. N. Reddy, "Modern Electrochemistry of Electrodics", Vol II (2001).
4. J. Rajaram, J. C. Kuriacose, "Chemical Thermodynamics", Pearson (2013).
5. I. A. Hill, "An Introduction to Statistical Thermodynamics", Dover Publications (1987).
6. I. N. Levine, "Physical Chemistry", McGraw Hill, 6th edition (2008).
7. D. R. Crow, "Principles and applications of Electrochemistry", John Wiley & sons, 2nd edition (2001).
8. A. J. Bard, F. R. Faulker, "Electrochemical methods: Fundamental & applications", Wiley 2nd edition (2000).

Course Outcomes (COs)

On completion of the course, students will be able to

CO1: derive and explain the concepts of equilibrium and non-equilibrium thermodynamics

CO2: classify and derive the various types of statistical thermodynamics

CO3: explain and justify the concepts behind in chemical and phase equilibria

CO4: discuss and analyze the theories of electrochemistry

CO5: discuss and explain the various models and process involved in electrochemistry

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	2	-	3	2	2	2	-	2	2	-	22
	2	2	3	2	2	-	2	2	2	3	2	1	-	-	21
	3	2	2	-	2	2	2	2	3	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															104
Mean value of COs with PSOs & POs = 104/50															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 Chemical Thermodynamics, Equilibria and Electrochemistry strongly related with PSOs and POs		

Applications of Spectroscopy

(Applicable to the students admitted from the academic year 2022-2023 onwards under OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core-9
Semester	: III	Hours	: 75
Code	: 22PCHC93	Credits: 4	

Course Educational Objectives

The course aims to make the students to

1. apply the UV-visible spectroscopy and IR spectroscopy to investigate the structure of organic compounds.
2. analyse and interpret the structure of organic compounds using NMR spectroscopy.
3. analyse critically the Mass spectroscopy and predict the structure of organic compounds.
4. analyse and interpret the structure of inorganic compounds using IR, Raman and NMR spectroscopy.
5. examine the NQR and Mossbauer spectra for structural elucidation of inorganic compounds.

Unit – I Organic Spectroscopy-I **(15 hours)**

UV-Vis Spectra of Organic Compounds

Characterization of organic compounds: application of Woodward-Fieser rules to conjugated dienes, α, β-unsaturated carbonyl compounds; benzene and its substituted derivatives; polycyclic aromatic hydrocarbons; polyenes; polyenes, and heterocyclic compounds.

IR Spectroscopy

Quantitative studies: calculation of force constants of IR vibrations, hydrogen bonding- intra- and intermolecular hydrogen bonding. Conformational studies: cyclic 1,2-diols and 1,3-diols, cyclohexanes. Characteristic group absorptions of organic compounds: carbon skeleton vibrations, alcohols, phenols, ethers, peroxides, ketones, aldehydes, carboxylic acids, esters, lactones, amines, amino acids; groups absorbing in the fingerprinting region, aromatic over tones and combination bands. Effect of inductive and mesomeric effects on carbonyl frequency – effect ring strain on carbonyl stretching frequency.

Unit – II Organic Spectroscopy-II **(15 hours)**

Chemical shifts: region of proton chemical shift in organic molecules; chemical shift equivalence – interchange through symmetry operations, tagging, restricted rotations, magnetic equivalence. NMR spectra of protons bonded to O, N, S: chemical exchange, hydrogen bonding. Factors influencing coupling constant – Karplus equation, simplification of complex spectra. ^{13}C NMR spectroscopy– off resonance decoupling, effect of alkyl and halogen substitution, hybridisation effects. Basic principle of 2D NMR spectroscopy, COSY, NOESY.

Unit – III Organic Spectroscopy-III (15 hours)

Mass spectroscopy

Basic principles – molecular ion peak – parent peak – fragments –meta stable ion – isotope peaks – determination of molecular weight and molecular formula – fragmentation pattern of simple organic molecules – McLafferty rearrangement – retro Diels Alder reaction.

Combined spectroscopic problems involving simple organic molecules.

Unit – IV Inorganic Spectroscopy-I (15 hours)

IR & Raman Spectroscopy

Selection rules for the linear and non-linear molecules. Rayleigh scattering, Stoke's and anti-Stoke's lines. Combined application of IR and Raman spectra for structural elucidation of CO_2, SO_2, N_2O, BF_3, cis- and trans-N_2F_2, C_2H_2, PCl_3, $POCl_3$, ClF_3. Rule of mutual exclusion. Group theoretical approach to find the IR and Raman active vibrations of simple C_{2v} and C_{3v} molecules.

NMR Spectroscopy

^{31}P NMR spectra of PF_3, PF_5, P_4S_3, H_3PO_2, H_3PO_3 and H_3PO_4.

^{19}F NMR spectra of ClF_3, PF_3, SF_4, PF_5, BrF_5 and equimolar mixture of TiF_6^{2-} and TiF_4 in ethanol.

Lanthanide shift reagents

Unit – V Inorganic Spectroscopy-II (15 hours)

NQR Spectroscopy

Quadrupole nucleus, nuclear quadrupole, electric field gradient (EFG) and asymmetry parameter, nuclear quadrupolar coupling constant (e^2qQ) – conditions to observe NQR signals – NQR spectroscopy to identify chemically inequivalent and crystallographically inequivalent NQR active sites – NQR spectra of $SiCl_4$, $PhAsCl_4$, $PFCl_4$, PCl_4Ph, PCl_5, Cl_3COCl.

Mössbauer Spectroscopy

Doppler effect, isomer shift, quadrupole splitting, magnetic interactions; magnetic and quadrupole splitting in ferromagnetic compounds, Mössbauer spectra of high- and low-spin Fe(II) and Fe(III) compounds; site symmetry of metal centers in iron complexes; differentiation of non-equivalent metal centers in polynuclear complexes; discovering oxidation states-Sn, Sn(II), Sn(IV) compounds.

Reference Books

1. P. S. Kalsi, "Spectroscopy of Organic Compounds", 6th Edition, New Age International (2007)

2. Y. R. Sharma, "Elementary Organic Absorption Spectroscopy", 5th Revised Edition, Chand & Co (2013)

3. Asim K Das & Mahua Das, "Fundamental Concepts of Inorganic Chemistry", Volume 7 (2016)

4. R. S. Drago, "Physical Methods in Inorganic Chemistry", Affiliated East-West Press (2012)

5. D. Nasipuri, Stereochemistry of Organic Compounds: Principles and Applications, 3rd Edition, New Age International (2018)

6. Jag Mohan, "Organic Spectroscopy – Principles and Applications", Narosa Publications (2009)
7. William Kemp, "Organic Spectroscopy", ELBS, 3rd Edition, Macmillan Publishers (2019)
8. Donald L. Pavia, Gary M. Lampman, George S. Kriz, James A. Vyvyan, "Introduction to Spectroscopy", 5th Edition, Cengage Learning India (2015)

Course Outcomes (COs)

On completion of the course, students will be able to

CO1: apply the UV-visible spectroscopy and IR spectroscopy to investigate the structure of organic compounds.

CO2: analyse and interpret the structure of organic compounds using NMR spectroscopy.

CO3: analyse critically the Mass spectroscopy and predict the structure of organic compounds.

CO4: analyse and interpret the structure of inorganic compounds using IR, Raman and NMR spectroscopy.

CO5: examine the NQR and Mossbauer spectra for structural elucidation of inorganic 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	3	2	3	-	2	3	2	-	-	-	-	-	18
	2	2	3	3	2	-	3	2	2	-	-	-	-	-	17
	3	3	2	2	3	-	2	3	2	-	-	-	-	-	17
	4	2	3	2	3	-	3	2	3	-	-	-	-	-	18
	5	3	2	3	2	-	2	2	3	-	-	-	-	-	17
Grand total of COs with PSOs & POs															87
Mean value of COs with PSOs & POs = 87/35															2.49

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			2.49
Observation	COs of Applications of Spectroscopy strongly related with PSOs and POs		

Research Methodology

(Applicable to the students admitted from the academic year 2022-2023 onwards under OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core Elective-1
Semester	: III	Hours	: 75
Code	: 22PCHE23	Credits: 3	

Course Educational Objectives

The course aims to make the students to

1. List the various types of research and research methods K1, K2
2. Classify the various available chemical literatures and various indexes and abstracts. K1, K2
3. Use the various tools for literature review for their research work K2, K3
4. Discuss the method of writing thesis and research articles and apply them in preparing dissertations K3, K4
5. Describe the various computational techniques in chemistry and apply them to interpret the data in research K4, K5

Unit – I Research Methodology: An Introduction   **(15 hours)**

Meaning, Objectives and motivation of research - Types of research - fundamental research, applied research, action research, historical research, experimental research. Characteristics of Research - Research Approaches: Qualitative and quantitative research - Significance of research - Research Methods versus Methodology - Research and Scientific Method. Research Process – problem identification, formulation and research design. Criteria for Good research and researcher - Problems encountered by Researchers in India.

Unit – II Chemical Literature and Abstracts   **(15 hours)**

Sources of chemical information: primary (Research article, short communications and letters), secondary (Review article, Textbooks and encyclopaedias) and tertiary sources (databases, catalogues, search engines).

Classical and comprehensive reference works in chemistry. Beilstein- compilations of data, synthetic methods and techniques, treatises, reviews.

Indexes and abstracts: Physical, chemical and biological abstracts – index chemicus - index medicus - science citation index – Thomson Reuters - indexing in Scopus and web of science.

Unit – III Online Literature Search   **(15 hours)**

Chemical Abstracts - Subject index, chemical substance index, formula index, index of ring systems, author index, patent index

Online literature search - SciFinder, Scopus, Web of Science, ChemPort, Google Scholar – As soon as publisheble (ASAP) Alerts, Chemical Abstract Alerts.

Journal homepage - American Chemical Society, Royal Society of Chemistry, Science Direct, Wiley, Springer, Taylor and Francis. Citation index – impact factor – h- index.

INFLIBNET – N-List – NDLI- e-Shodhganga. Researchgate, patent, orcid (Introductory idea only)

Unit – IV Research Reports and Thesis Writing (15 hours)

The art of scientific writing – forms of scientific writing, Research reports, Theses, Journal articles and books. Characteristics of a good report.

Format of a research report. Preface of the thesis - Title page, Researcher's declaration, Certificate of the Research Supervisor, Acknowledgements. Table of contents- List of tables - List of figures and illustrations – abbreviations, symbols & SI Units – Abstract – Introduction – Literature review – Aim and objectives – Methodology (Materials and methods) - Results and discussion, Summary & conclusion and recommendations. Citations and Bibliography – ACS, RSC and Elsevier format – Journal Abbreviations - Citation Management software (Endnote) – Mendeley - Footnotes.

Plagiarism – Plagiarism software – copyright – Self-Plagiarism.

Article submission-Journal finder, Guide for author for paper submission, abstract, graphical abstract, keywords, corresponding author, affiliation, conflict of interest, research highlights

Unit – V Computational techniques in Chemistry (MS Excel, Origin and ChemDraw)

(15 hours)

Components of MS Excel – spreadsheets, Database, chart, building formula – plotting straight line using excel- Solving simple problems and functions (exponential) using excel.

Origin – Components of origin – plotting and customizing graphs – merging graphs. Straight line fitting - Regression coefficient calculation using origin.

ChemDraw – components of ChemDraw - Drawing schemes – chemical equation schemes – Analysis and chemical properties – Templates available in ChemDraw – Chem3D. Basic knowledge about JCPDS file – interpretation of XRD data.

Reference Books

1. R. L. Dominoswki, Research Methods, Prentice Hall, 1981.
2. H. F. Ebel, C. Bliefert and W. E. Russey, The Art of Scientific Writing, VCH, Weinheim, 1988.
3. C.R. Kothari, "Research Methodology Methods and Techniques" New Age International Publishers, 2010.
4. G. Vijayalakshmi, C. Sivapragasam, "Research Methods Tips and Techniques" MJP Publishers, 2009.
5. H. M. Kanare, Writing the Laboratory Notebook; American Chemical Society: Washington, DC, 1985.
6. Gibaldi, J. Achtert, W. S. Handbook for writers of Research Papers; 2nd ed.; Wiley Eastern, 1987.

Course Outcomes (COs)

On completion of the course, students will be able to

CO1: classify the various research methodologies and research methods and apply them for the research works (K1, K2)

CO2: Use the various available chemical literatures and apply them in their research. (K1, K2)

CO3: Use the various tools for literature review for the project and research (K2, K3)

CO4: Implement the art of writing thesis in their project dissertation and also research articles. (K3, K4)

CO5: Apply and use Excel, ChemDraw, XRD interpretation in their research (K4, K5)

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	2	3	2	2	2	-	2	-	-	-	20
	2	2	2	2	2	3	2	2	3	-	3	-	-	-	21
	3	3	2	3	2	2	3	3	3	-	2	-	-	-	23
	4	2	3	2	2	2	2	2	2	-	2	-	-	-	19
	5	2	2	3	3	2	3	3	2	-	2	-	-	-	22
Grand total of COs with PSOs & POs															105
Mean value of COs with PSOs & POs = 105/45															2.33

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			2.33
Observation	COs of Research Methodology strongly related with PSOs and POs		

Polymer Chemistry
(Applicable to the students admitted from the academic year 2022-2023 onwards under OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core-Elective-1
Semester	: III	Hours	: 75
Code	: 22PCHE23	Credits: 3	

Course Educational Objectives

The course aims to make the students to

1. classify and explain the types of polymerization (K1, K2)
2. categorize and explain the techniques of polymerization (K2, K3)
3. analyse critically the molecular weight distribution of polymers (K3, K4)
4. analyse and interpret the morphology and glass transition temperature of polymers (K3, K4)
5. explain and examine the polymer degradation and stabilization by various means and methods (K3, K4)

Unit – I Classification of Polymers   (15 hours)

Addition- condensation, Chain/step growth polymerization, organic-inorganic, natural-synthetic, thermoplastic – thermosetting, polar - nonpolar polymers with suitable examples, based on applications - fibers, foams, adhesives and elastomers, based on performance – commodity and engineering polymers. Homopolymers, co-polymers, linear polymers, branched polymers, cross linked or three dimensional polymers, block and graft co-polymers, linear, branched, crosslinked types of polymers. Hyperbranched, star branched dendrimers, semiladder, ladder and layerlatties - polymers.

Unit – II Techniques of Polymerization   (15 hours)

Bulk, solution, precipitation, suspension, emulsion, inverse emulsion, melt polycondensation, solution polycondensation, interfacial polymerization, phase transfer catalyzed interfacial polymerization, solid state polymerization and gas phase polymerization. Batch, semibatch and continuous process, merits and limitations of each process and comparison of various polymerization processes with suitable commercial examples. (Polymerization in ionic liquids, in super critical media and   MW induced. Approach to combinatorial polymer synthesis).

Unit – III Polymer Molecular Weights   (15 hours)

Molecular mass of Polymers: Molecular mass distribution, Distribution curve, Polydispersity, Molecular mass average determination, Absolute and relative methods. Colligative properties: ebullioscopy, cryoscopy, end group analysis, Membrane Osmometry, Vapour phase osmometry, Light scattering, Ultracentrifugation. Solution viscosity - Intrinsic viscosity, Determination of viscosity average molecular weight, Mark-Howink equation, determination of k and a, Fractionation of polymers- Gel permeation chromatography (GPC), Relation of chromatogram shape and MWD.Polymer conformation and chain dimensions, freely jointed chains, real chains, characteristic ratio.

Unit – IV Morphology of Polymers (15 hours)

Crystalline and amorphous phase, factors affecting polymer crystallinity, XRD analysis for polymer crystallinity, crystallites, amorphous regions, spherulites, single crystal, fibrils, Orientation, transitions, glass transition temperature (Tg), factors affecting Tg of polymers, determination of Tg, TMA and DSC, interpretations of DSC thermogram, applications - Tg, Tm, heat of fusion and degree of crystallinity etc. (Principles of TMA and DSC expected).

Unit – V Polymer Degradation and Stabilization (15 hours)

Chemical degradation, physical degradation, ageing, crazing, degradation by micro organisms, Biodegradable polymers, Mechanism of degradation, secondary chain reaction, Self reaction, depolymerisation, metal catalysed degradation, Thermal oxidation, Photooxidation, Mechanical degradation, Degradation by ionizing radiation, ozone attack. Degradation of special polymers: Polyolefins, PVC, PS, PMMA. Stabilization: Chain breaking antioxidants, bound antioxidants, Radiation protection, Stabilization against biodegradation.

Reference Books

1. Fred W. Billmeyer,"Textbook of Polymer Science Polymer Chemistry" Wiley India (2008).
2. A Ravve, "Principles of Polymer Chemistry", 2nd Edition. Kluwer Academic Publisher (2000).
3. Charles E. Carraher, "Seymour/Carraher's Polymer Chemistry", 7th Edition, CRC Press (2008).
4. Fred J. Davis, "Polymer Chemistry - A Practical Approach", Oxford University Press (2004).
5. V. R. Gowariker, V. N. Vishwanathan and J. Sreedhar, "Polymer Science", Wiley-Eastern Limited (2005).

Course Outcomes (COs)

On completion of the course, students will be able to

CO1: classify and explain the types of polymerisation.

CO2: categorize and explain the techniques of polymerisation

CO3: analyse critically the molecular weight distribution of polymers.

CO4: analyse and interpret the morphology and glass transition temperature of polymers.

CO5: explain and examine the polymer degradation and stabilization by various means and methods.

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	3	2	-	-	-	-	-	17
	2	2	3	2	2	-	3	2	2	-	-	-	-	-	16
	3	2	2	2	3	-	2	3	2	-	-	-	-	-	16
	4	2	2	3	2	-	3	2	3	-	-	-	-	-	17
	5	3	2	3	2	-	2	2	3	-	-	-	-	-	17
Grand total of COs with PSOs & POs															83
Mean value of COs with PSOs & POs = 83/35															2.37

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			2.37
Observation	COs of Polymer Chemistry strongly related with PSOs and POs		

Physical Chemistry Practical - II
(Applicable to the students admitted from the academic year 2022-2023 onwards under
OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core-Lab-5
Semester	: III	Hours	: 60
Code	: 22PCHP53	Credits: 3	

Course Educational Objectives
The course aims to make the students to

1. Understand the principle of conductometry, potentiometry, kinetics and phase diagram.
2. Learn to set up the reaction set-up and to calibrate the instruments.
3. Obtain the data from the experiments and interpret them.
4. Carry out experiments with accuracy and precession.

1. General Experiments
1. Determination of rate constant for hydrolysis of methyl acetate by acid
2. Phase diagram - three component system
3. Determination of activation energy and Arrhenius factor
4. Determination of molecular weight of the substance by Rast method
5. Determination of transition temperature of a hydrated salt

2. Conductometry Experiments
1. Determination of equivalent conductance of a strong electrolyte
2. Conductometric acid-base displacement titration

3. Potentiometry Experiments
1. Potentiometric precipitation titration – Estimation of halide ions
2. Potentiometric redox titration – Estimation of iodide ions

4. Demo for UV-visible spectroscopy and IR spectroscopy
Reference Books
1. J. B. Yadav, "Advanced Practical Physical chemistry", 20th Edition. GOEL publishing House, Krishna Pakashan Media Ltd., (2001)
2. Findlay's, "Practical Physical Chemistry" Revised and edited by B. P. Levitt, 9[th]Edition, Longman, London, (1985).
3. J. N. Gurtur and R. Kapoor, "Advanced Experimental chemistry", Vol. I. Chand &Co., Ltd, New Delhi, (1987).

Course Outcomes (COs)
On completion of the course, students will be able to
CO1: perform physical chemistry experiments with high accuracy and precision
CO2: interpret the experimental data, draw graphs and draw conclusions from them
CO3: construct, develop and design new experiments from the learned skills.

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	3	-	-	-	2	23
	2	2	3	2	3	2	2	2	3	3	-	-	-	2	24
	3	2	2	2	2	2	2	2	3	3	-	-	-	2	22
Grand total of COs with PSOs & POs															69
Mean value of COs with PSOs & POs = 69/30															2.30

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			2.30
Observation	COs of Physical Chemistry Practical II strongly related with PSOs and POs		

Inorganic Chemistry Practical - II

(Applicable to the students admitted from the academic year 2022-2023 onwards under OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core-Lab-6
Semester	: III	Hours	: 60
Code	: 22PCHP63	Credits: 3	

Course Educational Objectives

The course aims to make the students to

1. recall the principles of qualitative analysis
2. recognize the chemical reactions of acid and basic radicals
3. classify and find acid and basic radicals
4. apply colorimetric techniques to estimate the given solution and interpret spectral data

1. Inorganic cation analysis

Analysis of mixtures containing two common and two less common cations.
Ions of the common metals: Pb, Cu, Mn, Cr, Al, Ni, Co, Ba, Sr, Ca, Mg
Ions of less common metals: W, Se, Te, Mo, Ce, Th, Zr, Ti, V, U, Li.

2. Colorimetric estimations

Colorimetric estimations of copper, nickel and iron using photoelectric colorimeter.

3. Spectral Interpretation

Identification of compounds using spectral data of UV and IR (Demo only).

Reference Books

1. V.V.Ramanujam, Inorganic Semimicro qualitative analysis, 3rd edition, National Publishing company, 2004
2. *R. Mukhopadhyay & P. Chatterjee, Advanced Practical Chemistry, Book & Allied (p) ltd 2007.*
3. A. I. Vogel, "Quantitative Inorganic Analysis", 7th Edition, Pearson Education, (2002)
4. G. Suehla and B. Sivasankar, Vogel's qualitative inorganic analysis (revised) pearson, 7th Edition, Orient Longman (1996)

Course Outcomes (COs)

On completion of the course, students will be able to

CO1: recognize the methods of inorganic analysis

CO2: compare the properties of various group cations

CO3: analyze and identify the test involved in cations

CO4: explain techniques involved in colorimetric estimation and interpret spectral data.

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	2	3	3	-	-	-	2	3	3	23
	2	3	2	3	2	2	2	2	-	-	-	2	2	2	22
	3	2	3	-	2	2	3	2	-	-	-	3	2	2	21
	4	2	3	2	3	2	2	3	-	-	-	2	2	2	23
Grand total of COs with PSOs & POs															112
Mean value of COs with PSOs & POs = 112/48															2.33

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			2.33
Observation	COs of Inorganic Chemistry Practical II strongly related with PSOs and POs		

Analytical Chemistry

(Applicable to the students admitted from the academic year 2022-2023 onwards under OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core-10
Semester	: IV	Hours	: 60
Code	: 22PCHD04	Credits: 3	

Course Educational Objectives

The course aims to make the students to

1. Examine the errors and analyse critically to minimize errors in chemical analysis. (K3, K4, K5)
2. Discuss the principle of titrimetric analysis (K3, K4)
3. Interpret the results of various thermal analysis of compounds (K4, K5)
4. describe and apply the various chromatographic principles in separation of organic compounds (K2, K3, K4)
5. Investigate and analyse the various compounds qualitatively and quantitatively using various electroanalytical techniques (K4, K5)

Unit – I Errors in Chemical Analysis   **(12 hours)**

Errors and treatment of analytical data – Classification of errors - Systematic and random errors – minimization and elimination of errors - Accuracy and precision - Distribution of experimental results.

Statistical treatment –Significant Figures – mean – standard deviation – variance, confidence interval. Application of statistics to data treatment and evaluation - student-t and f tests - detection of gross errors, rejection of a result-Q test – Chi square test - estimation of detection limits – signal to noise ratio – Calibration of plots - Least square analysis - correlation coefficient and its determination - numerical problems involving straight line graphs.

Unit – II Titrimetric analysis   **(12 hours)**

Stoichiometry and expressions of concentrations. Principle – titration curves of a weak dibasic acid versus strong base.

Redox titrations: Formal and standard potentials in various media – standardization - oxidizing systems: Mn(VII) and Cr(VI) - Reducing systems: Sn(II) and Fe(II).

Acid-base titrations in non-aqueous solvents: Classification – principle - auto-protolysis constant - dielectric constant and its effect. Detection of equivalence point – titrations in ethylene diamine, glacial acetic acid.

Complexometric Titrations: Stability of complexes - stepwise formation constants - titration curves - feasibility of complexation titration.

Unit – III Spectral and Thermal Techniques   **(12 hours)**

AAS and AES: Principle - Instrumentation - Types of optical instruments - components of optical instruments - sources, monochromators and detectors - Sample preparations - Applications in quantitative analyses.

Thermogravimetry (TG), Differential Thermal Analysis (DTA) and Differential Scanning Calorimetry (DSC) – Principle – instrumentation – Characteristics of TGA and DTA curves - Factors affecting TGA & DTA curves – TG-DTA curves of $CaC_2O_4. H_2O$ and $CuSO_4. 5H_2O$ – Phase transition studies using DSC.

Unit – IV Electroanalytical Techniques (12 hours)

Two electrode and three electrode system - importance of supporting electrolyte - mass transport processes - General classification of electroanalytical techniques.

Polarography – Principle – Polarographic measurements - interpretation of polarographic waves - equation for polarographic wave - half wave potential - DME - Applications.Amperometric Titrations.

Cyclic voltammetry – Principle – instrumentation – Applications of CV: prediction of reaction mechanism - redox behaviour of compounds – identification of number of electrons in redox reactions.

Ion selective electrodes – theory and applications of Potentiometry and coulometric titration.

Unit – V Chromatographic Techniques (12 hours)

Super critical fluid chromatography - Reversed phase chromatography - Ion exchange and Gel permeation chromatography.

HPLC - Principles – advantages of HPLC– instrumentation - applications of HPLC.

Gas Chromatography – Principle – Instrumentation - Carrier gas – Column – Detector – Applications.

Electrophoresis and capillary electrophoresis - principle, instrumentation and applications.

Reference Books

1. Daniel C. Harris, Charles A. Lucy, "Quantitative Chemical Analysis" W. H. Freeman, 10th Edition, 2019.
2. D. A. Skoog, D. M. West and F. J. Holler, Analytical Chemistry an Introduction, Saunders College Publishers, 2000.
3. J. Mendham, R. C. Denney, J. D. Barnes and M. Thomas, Vogel's Text book of Quantitative Chemical Analysis, Pearson Education Pvt. Ltd., 2004.
4. Douglas A. Skoog, Donald M. West, F. James Holler, Stanley R. Crouch, "Fundamentals of Analytical Chemistry", 9th Edition, Cengage Learning (2013).
5. R. A. Day Jr. A. L. Underwood, "Qualitative Analysis", 6th Edition, PHI Learning Private Limited (2012).
6. K. S. Viswanathan R. Gopalan,"Analytical Methods: Interpretation, Identification, Quantification", Universities Press (2018).
7. H. Kaur, Instrumental methods of Chemical Analysis, Pragati Prakashan, (2010).
8. James W. Robinson, Eileen M. Skelly Frame, George M. Frame II, "Instrumental Analytical Chemistry" CRC Press, (2021).
9. J. Mendham, R. C. Denney, J. D. Barnes & M. Thomas, "Vogel's Text book of Quantitative Chemical Analysis", Pearson Education (2010).

10. A. Sharma, S. G. Schulman, "Introduction to Fluorescence Spectroscopy", Wiley-Interscience, (1999).
11. C. N. Banwell and E. M. McCash, "Fundamentals of Molecular Spectroscopy", 4th edition Tata McGraw Hill (2017).
12. Vogel, A.I. "A Textbook of Quantitative Inorganic Analysis", ELBS. (2013).

Course Outcomes (COs)

On completion of the course, students will be able to

CO1: examine the errors and analyse critically to minimize errors in chemical analysis.

CO2: discuss and apply the concepts of titrimetric analysis

CO3: interpret the results of various thermal analysis of compounds

CO4: describe and apply the various chromatographic principles in separation of organic compounds

CO5: investigate and analyse the various compounds qualitatively and quantitatively using various electroanalytical techniques

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	2	3	3	2	2	3	2	-	-	2	26
	2	2	2	2	2	2	3	2	2	2	3	-	-	2	24
	3	3	2	2	2	2	2	2	2	2	2	-	-	2	23
	4	2	3	2	3	2	2	2	2	3	2	-	-	2	25
	5	2	2	2	2	2	2	3	2	2	3	-	-	2	24
Grand total of COs with PSOs & POs															122
Mean value of COs with PSOs & POs = 122/55															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 Analytical Chemistry strongly related with PSOs and POs		

Photochemistry, Pericyclic reactions and Supramolecular Chemistry
(Applicable to the students admitted from the academic year 2022-2023 onwards under
OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core-11
Semester	: IV	Hours	: 75
Code	: 22PCHD14	Credits: 4	

Course Educational Objectives

The course aims to make the students to

1. identify the coordination complexes having photochemical properties in energy conversion applications (K3, K4, K5)

2. illustrate the applications of photochemistry in organic reactions and rearrangements (K4, K5)

3. describe and illustrate the orbital correlation of pericyclic reactions with selectivity (K2, K3, K4)

4. explain the bonding forces in supramolecules and classification of supramolecules (K2, K3)

5. examine the synthetic route to assemble various types of supramolecules and applications of supramolecules in catalysis (K2, K3, K4)

Unit – I   Photochemistry – I   (15 hours)

Laws of photochemistry - photophysical processes - Jablonski diagram - fluorescence - phosphorescence - Kasha's rule - Stern-Volmer relationship-Stoke's shift - types of electronic transitions in transition metal complexes - photochemistry of Cr(III) complexes - photosubstitution - photoaquation - Adamson's rules - photorearrangement – isomerisation– racemisation - photoredox reactions - solar energy conversion – photogalvanic cell – splitting of water to evolve hydrogen and oxygen.

Unit – II   Photochemistry – II   (15 hours)

Fundamental concepts - Jablonskii diagram - - Intersystem crossing - Energy transfer - Molecular orbital view of excitation - The geometry of excited states - Reactivity of electronically excited ketones - α- cleavage - γhydrogen transfer Norrish Type I and Type II-Paterno Buchi reaction – photochemistry of alkenes and dienes - photochemistry of enones and Dienones, photo reduction, photochemical oxidation (di-pi methane or Zimmerman rearrangement), Oxa-di-pi methane rearrangement-Barton reaction –photo Fries rearrangement - photo chemistry of α , β unsaturated carbonyl compounds – photo chemistry of arenes.

Unit – III   Pericyclic reactions   (15 hours)

Pericyclic reactions: Concerted reactions – orbital symmetry and correlation diagram approach – FMO and PMO approach, Woodward-Hofmann rules – Electrocyclic reactions (1,3-butadiene-cyclobutene and 1,3,5-hexatriene-cyclohexadiene systems) – cycloadditions [2+2] and [2+4] systems (ethylene-cyclobutane, ethylene and 1,3-butadiene-cyclohexene

systems) – selection rules – cycloreversion (reterocycloaddition reactions) – 1,3-dipolar cycloaddition - sigmatropic rearrangements – Sommelet-Hauser, Cope, Fries and Claisen rearrangements.

Unit – IV   Fundamentals of Supramolecular Chemistry   (15 hours)

Origins to supramolecular chemistry – various types of non-covalent interaction – Nature and importance of supramolecular assemblies- ion-ion, ion-dipole, dipole-dipole, H-bonding, cation-p, anion-p, p-p, van der Waals interactions, Solvation and hydrophobic effects. Classification of supramolecules – Molecules with specific shape – Rotaxane, catenane, Dendrimers Molecules recognizing a partner molecule by lock and key and guest-host chemistry – crown ethers, macrocyclic polyamines, cyclodextrin, calixarene.

Unit – V Synthesis and Applications of Supramolecules   (15 hours)

Template synthesis of Schiff bases – synthesis of calixarenes, crown ethers and cryptands- Salient features of supramolecular catalysis Product selectivity, stereospecificity – Supramolecular polymers - Main chain supramolecular polymers, side-chain supramolecular polymers, examples of stimuli responsive supramolecular polymers and selfhealing polymers- Applications of Dendrimers.

Reference Books

1. Jagdamba Singh & Jaya Singh, "Photochemistry and Pericyclic reactions", New Age International (2005)
2. K. K. Rohotgi-Mukherjee, "Fundamentals of Photochemistry", 3rd Edition, New Age Publishers (2017)
3. Satyajit Dey, Nirmal Hazra, "Pericyclic Reactions & Organic Photochemistry", Techno World (2019)
4. A.K. Das, M. Das, "An Introduction to Supramolecular Chemistry", CBS Publishers & Distributors Pvt Ltd (2020).
5. P.S. Kalsi, J.P. Kalsi, Ashu Chaudhary, Bioorganic, Bioinorganic and Supramolecular Chemistry, 4th Edition, New Age International Publisher (2020).
6. J.M. Lehn, Supramolecular Chemistry Concepts and Perspectives, Wiley Publisher (2018).
7. K. K. Rohatgi and Mukerjee, Fundamentals of Photo Chemistry, Wiley Eastern Ltd (1986)
8. J. W. Steed and J. L. Atwood, "Supramolecular Chemistry", John Wiley & Sons (2013)

Course Outcomes (COs)

On completion of the course, students will be able to

CO1: identify the coordination complexes having photochemical properties in energy conversion applications

CO2: illustrate the applications of photochemistry in organic reactions and rearrangements

CO3: describe and illustrate the orbital correlation of pericyclic reactions with selectivity

CO4: explain the bonding forces in supramolecules and classification of supramolecules

CO5: examine the synthetic route to assemble various types of supramolecules and its applications.

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	2	-	3	2	2	-	2	2	2	2	24
	2	2	2	2	-	2	3	2	2	2	-	2	2	2	23
	3	3	2	2	-	2	2	2	-	2	2	-	2	2	21
	4	2	3	2	-	2	2	2	2	-	2	2	2	2	23
	5	2	2	2	2	-	2	3	2	-	-	2	2	2	21
Grand total of COs with PSOs & POs															112
Mean value of COs with PSOs & POs = 112/53															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 Photochemistry, Pericyclic reactions and Supramolecular Chemistry strongly related with PSOs and POs		

Chemical Kinetics, Surface and Polymer Chemistry

(Applicable to the students admitted from the academic year 2022-2023 onwards under OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core-12
Semester	: IV	Hours	: 75
Code	: 22PCHD24	Credits: 4	

Course Educational Objectives

The course aims to make the students to

1. Discuss the various theories of reaction rate to understand mechanism involved in reactions (K3, K4)
2. Explain the kinetics of complex, fast and polymerization reactions (K3, K4)
3. Examine the kinetics in solution and homogeneous catalytic reactions (K3, K4)
4. Discuss the basic concepts of surface chemistry and deduce the kinetics of surface reactions (K4, K5)
5. Describe the sources of cheminformatics and discuss the various aspects of polymers (K3, K4)

Unit – I Theories of Reaction Rate   (15 hours)

Basic kinetic concepts – Arrhenius equation – potential energy surfaces and reaction coordinates – Theories of reaction rates – Collision theory of bimolecular gaseous reaction – Transition State theory (ARRT) – Thermodynamic derivations of ARRT – Eyring equation - estimation of free energy, enthalpy and entropy of activation and their significance - Theories of unimolecular reactions – Lindemann andHinshelWood treatments. Elementary idea of RRK, RRKM and Slater's treatments.

Unit – II Kinetics of Complex, fast and polymerization Reactions   (15 hours)

Kinetics of complex reactions – rate expression for opposing, parallel and consecutive reactions. Chain reactions - chain length, Rice-Herzfeld pyrolysis of acetaldehyde - kinetics of decomposition of HI&anthracene dimerization reactions in benzene (Photochemical reactions).

Kinetics of fast reactions - Methods of studying fast reactions- flow methods - relaxation technique, flash photolysis.

Kinetics of polymerization reactions – Principle of polymerization kinetics – molecular and free radical mechanisms

Unit – III Kinetics in Solution and Catalysis   (15 hours)

Application of ARRT to solution kinetics-effects of solvents, double sphere model, effect of ionic strength on ionic reactions –kinetic isotope effect.

Catalysis – Introduction – selectivity – promotors – catalytic poisoning – deactivation of catalyst – inhibitors - auto catalysis – turnover number.

Homogeneous catalysis - Hammett acid-base catalysis – rate of acid and base catalysis – acidity function - Bronsted catalysis law - Enzyme catalysis: Brief introduction on enzymes – advantages – Michaelis-Menten kinetics -Lineweaver Burk plot – The Eadie-Hofstee Method - enzymatic inhibitor – Influence of pH and temperature.

Unit – IV Surface Chemistry **(15 hours)**

Adsorption – Physisorption and Chemisorption – Adsorption isotherms - Freundlich, Langmuir, BET and Gibbs adsorption isotherms – surface area determination - Adsorption from solution – surface film. Electro-kinetic phenomena – zetapotential.

Kinetics of surface reactions: Langmuir-Hinshelwood mechanisms – unimolecular and bimolecular surface reactions.

Micelles – formation, critical micellar concentration (CMC), factors affecting CMC in aqueous media, micellar catalysis – reverse micelles.

Unit – VPolymer Chemistry and Cheminformatics **(15 hours)**

Polymers – Monomers, Oligomers, polymers and their characteristics - Classifications of polymers – Bonding in polymers – primary and secondary forces in polymers - Molar masses of polymers – number average and mass average molar mass – Glass transition temperature – factors influencing glass transition temperature – Determination of molar masses – Polymerization reactions – Mechanism of addition, condensation, free radical polymerization. Zeigler Natta Polymerization – step growth polymerization – gas phase polymerization.

Introduction to cheminformatics –evolution of cheminformatics –prospects and applications of cheminformatics – data, relational database management - introduction to molecular modelling and drug design.

Reference Books

1. K. J. Laidler, "Chemical Kinetics", 3rd edition, Tata McGraw Hill (2008)
2. Tim Clark, "A Handbook of Computational Chemistry", John Wiley, New York (1985)
3. Vasanth R. Gowariker, N. V. Viswanathan, Jayadev Sreedhar, "Polymer Science" New Age International (2005)
4. P. W. Atkins, "Advanced Physical Chemistry", 7thedition, Clarendon (2002)
5. S. M. Bachrach, "Internet for Chemists". ACS Publications. Washington (1996)
6. A. R. Leach, "Molecular Modelling Principles & Applications", 2nd edition, Prentice Hall (2001)
7. J. C. Kuriacose and J. Rajaram, Kinetics and Mechanisms Transformations, Macmillan & Co (1993)
8. S. K. Basandra, "Local Area Networking". Galgotia (1999)
9. A. S. Tanenbaum, "Computer Networks". Prentice Hall of India (1996)

Course Outcomes (COs)

On completion of the course, students will be able to

1. Examine the theories of reaction rate to elucidate the mechanism of reactions (K3, K4)
2. Derive the rate expression for fast, complex and polymerization reactions and validate its mechanism of similar other reactions (K3, K4)
3. deduce the kinetics of reactions in solution and propose the mechanism of homogeneous catalytic reactions (K3, K4)

4. Apply the underlying concepts of surface chemistry to deduce the kinetics of surface reactions (K4, K5)
5. Explain the various preparation and properties of polymers and describe the sources of cheminformatics (K3, K4)

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	3	3	2	2	2	-	-	-	24
	2	2	3	3	2	2	2	2	3	2	3	-	-	-	24
	3	3	2	2	2	2	3	2	2	3	2	-	-	-	23
	4	2	2	2	3	2	2	3	2	2	2	-	-	-	22
	5	2	2	2	2	3	2	2	3	2	2	-	-	-	22
Grand total of COs with PSOs & POs															115
Mean value of COs with PSOs & POs = 115/50															2.3

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			2.3
Observation	COs of Chemical Kinetics, Surface and Polymer Chemistry & Cheminformatics strongly related with PSOs and POs		

Biochemistry & Medicinal Chemistry

(Applicable to the students admitted from the academic year 2022-2023 onwards under OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core-Elective-3
Semester	: IV	Hours	: 60
Code	: 22PCHE34	Credits: 3	

Course Educational Objectives

The course aims to make the students to

1. Outline the basic principles and approaches to new drug design and select the proper drug design method (K2, K3)
2. Describe the importance of enzyme and to explain the chemistry of drugs and drug action drug action (K2, K3)
3. Classify and to recognize chemotherapy and antimicrobial agents (K2, K3)
4. identify the catalytic power, specificity and regulation properties and uses of enzymes
5. Assess the chemistry of co-enzymes, and biotechnological applications and clinical uses and uses of coenzymes in various fields (K3, K4)

Unit – I Physical Principles (12 hours)

Structure and activity – Relationship between chemical structure and biological activity (SAR) – Receptor Site Theory. Approaches to drug design – Introduction to combinatorial synthesis in drug discovery – Factors affecting bioactivity – Relationship between Free-Wilson analysis and Hansch analysis.

Unit – II Drug Action (12 hours)

Pharmacodynamics – Introduction – elementary treatment of enzymes stimulation – enzyme inhibition – sulfonamides – membrane active drugs – drug metabolism – xenobiotics – biotransformation – significance of drug metabolism in medicinal chemistry.

Unit – III Antibiotics and Antibacterials (12 hours)

Introduction, Antibiotic β-Lactam type - Penicillins, Cephalosporins, Antitubercular. Streptomycin, Ciprofloxacin, Norfloxacin. Broad spectrum antibiotics. Tetracyclines – Anticancer – Dactinomycin (Actinomycin D) – Synthesis & drug action, antibacterial drug.

Unit – IV Nucleic Acids (12 hours)

Double helical structure of DNA – structure of RNA. DNA replication - semi-conservative nature of replication – RNA transcription – Genetic code and biosynthesis of proteins. Recombinant DNA-Cloning vectors – restriction enzymes for cloning – techniques of restriction mapping – construction of a restriction map – construction of chimeric DNA – molecular probes – construction and screening of genomic and CDNA libraries.

Unit – V Vitamins and Co-Enzymes (12 hours)

Co-Enzyme Chemistry. Cofactors as derived from vitamins – coenzymes – prosthetic groups – apoenzymes. Structure and biological functions of coenzyme A – thiamine pyrophosphate, pyridoxal phosphate, NAD^+, $NADP^+$, FMN, FAD, lipoic acid, vitamin B12. Enzyme Models – Host-guest chemistry – chiral recognition and catalysis – molecular recognition – molecular

asymmetry and prochirality. Biotechnological Applications of Enzymes – Use of enzymes in food and drink industry – brewing and cheese making. Enzymes as targets for drug design – Clinical uses of enzymes, enzyme therapy.

Reference Books

1. John M. Beale, Jr., John H. Block. Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry, 12th Revised Edition (2010)
2. S.S. Pandeya& J.R. Dimmock, An Introduction to Drug Design, New Age International (1997)
3. U. Satyanarayana, U. Chakrapani, Biochemistry, 5th Edition, Elsevier (2020)
4. J. L. Jain, Sunjay Jain and Nitin Jain, Fundamentals of Biochemistry, 7th Edition, S Chand; (2016)
5. R.B. Silverman, The Organic Chemistry of Drug Design and Drug Action, Academic Press, 2nd Edition, 2004.
6. D. Lednicer, Strategies for Organic Drug Synthesis and design, John Wiley, 2nd Edition, 2008.
7. Donald Voet, Judith G. Voet& Charlotte W. Pratt, "Principles of Biochemistry", 3rd Edition, John Wiley & Sons (2004)
8. Ivano Bertini, Harry B. Gray, Stephen J. Lippard and Joan Selverstone Valentine, "Bioinorganic chemistry", University Science Books (1994)
9. A. L. Lehninger, D. L. Nelson & M.M. Cox, "Principles of Biochemistry", CBS Publishers, Delhi, 4th Edition (2004).
10. P.K. Gupta, Elements of Biotechnology, Rastogi Publications, 1st Edn.,(1994).

Course Outcomes (COs)

On completion of the course, students will be able to

CO1: outline the basic principles and approaches to new drug design and select the proper drug design method

CO2: describe the importance of enzyme and to explain the chemistry of drugs and drug action drug action

CO3: classify and recognize chemotherapy and antimicrobial agents

CO4: identify the catalytic power, specificity and regulation properties and uses of enzymes.

CO5: assess the chemistry of co-enzymes, and biotechnological applications and clinical uses and uses of coenzymes in various fields.

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	3	2	2	3	2	2	2	-	-	2	25
	2	2	2	2	2	3	3	2	2	2	2	-	-	2	24
	3	3	2	2	2	2	2	2	3	2	3	-	-	2	25
	4	2	2	3	2	2	2	2	2	2	2	-	-	2	23
	5	2	2	2	3	2	2	2	2	3	2	-	-	2	24
Grand total of COs with PSOs & POs															121
Mean value of COs with PSOs & POs = 121/55															2.2

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	-	-	2.2
Observation	COs of Biochemistry and Medicinal Chemistry strongly related with PSOs and POs		

Green Chemistry

(Applicable to the students admitted from the academic year 2022-2023 onwards under OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core-Elective-3
Semester	: IV	Hours	: 60
Code	: 22PCHE34	Credits: 3	

Course Educational Objectives

The course aims to make the students to

1. To learn the principle and importance of green chemistry
2. To understand about the green solvents and green chemistry strategies for designing the chemical synthesis.
3. Acquire knowledge in ionic liquids and phase transfer catalyst.
4. To study about the supercritical CO_2 in green synthesis.
5. explain the metabolism, storage of carbohydrates, Glycogenesis, Glycolysis, Citric acid cycle and Pentose phosphate pathway.

Unit – I Introduction to Green Chemistry (12 hours)

Green chemistry - Introduction - need for green chemistry - goals of green chemistry - Anastas twelve principles of green chemistry –Limitations and the progress of green chemistry. Atom economy. Designing a green synthesis - choice of starting materials, solvents, catalysts, reagents, processes with suitable examples.

Unit – II Microwave and Ultrasound Assisted Organic Synthesis (12 hours)

Microwave activation - advantages of microwave exposure –Difference between conventional heating and microwave heating. Microwave assisted reactions, condensation reactions - oxidation, reduction reactions, multicomponent reactions.

Sonochemistry– uses, acoustic cavitation - saponification - substitution, addition, oxidation reactions, reductions by sonochemical method.

Unit – III Ionic liquids - Phase Transfer Catalyst (12 hours)

Ionic liquids - synthesis, physical properties of ionic liquids - applications in alkylation, epoxidation, Friedal-Crafts reaction - Diels-Alder reactions – Knoevengal condensations and Wittig reactions.PTC–Crown ethers, Quaternary ammonium salt. Definition - advantages, types of PTC reactions - synthesis of PTC, applications of PTC in organic synthesis - Michael reaction - alkylation of aldehydes and ketones. Wittig, generation of dihalocarbene, elimination reaction.

Unit – IV Biocatalyst and Supercritical CO_2 in Green Synthesis (12 hours)

Solid supported synthesis - use of biocatalysts in green chemistry - advantages - biochemical (microbial) oxidation and reduction reactions.

Supercritical CO2- uses in extracting natural products, dry cleaning, bromination, Kolbe-Schmidt synthesis - Friedel-crafts reaction. Dimethyl carbonate as a methylating agent in green synthesis.

Unit – V Industrial case studies (12 hours)

Methyl Methacrylate (MMA)- Greening of Acetic acid manufacture, Vitamin-C – Leather manufacture- Types of Leather- Difference between Hide and Skin- Tanning – Reverse tanning- Vegetable tanning- Chrome tanning- Fat liquoring- Dyeing- Application- Polyethylene-Ziegler Natta Catalysis, Metallocene Catalysis- Eco friendly Pesticides- Insecticides.

Reference Books

1. Paul T. Anastas and John C. Warner, "Green Chemistry", Oxford University Press, Indian Edition, 2008.
2. V. K. Ahluwalia and M. Kidwai, "New Trends in Green Chemistry", Anamaya Publishers, 2nd Edition, 2007.
3. V. Kumar, "An Introduction to Green Chemistry", Vishal Publishers, 1st Edition, 2013.
4. V. K. Ahluwalia and R. S. Varma, "Green Solvents", Narosa Publishing, 1st Edition, 2009.
5. V.K.Ahluwalia and Renu Aggarwal, "Organic Synthetic Special Techniques", Narosa, 2nd Edition, 2009.

Course Outcomes (COs)

On completion of the course, students will be able to

CO1: Have the knowledge on twelve principles of green chemistry.

CO2: Apply the attractive techniques in green chemistry.

CO3: Use of ionic liquids and phase transfer catalyst in green synthesis.

CO4: Use of biocatalyst and supercritical CO_2 synthesis in green chemistry

CO5: Have a knowledge on Applications of green 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	3	3	2	2	3	3	3	2	2	3	-	-	-	26
	2	2	2	3	3	2	2	2	2	2	2	-	-	-	22
	3	3	2	2	3	2	2	3	2	2	2	-	-	-	23
	4	3	2	2	3	2	3	2	2	2	2	-	-	-	23
	5	2	3	3	2	3	2	3	2	2	2	-	-	-	24
Grand total of COs with PSOs & POs															118
Mean value of COs with PSOs & POs = 118/50															2.36

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			2.36
Observation	COs of Green Chemistry strongly related with PSOs and POs		

Project
(Applicable to the students admitted from the academic year 2022-2023 onwards under OBE Pattern)

Class	: II M.Sc. Chemistry	Part	: Core
Semester	: IV	Hours	: 180
Code	:	Credits: 7	

Course Educational Objectives
The course aims to make the students to
1. review and analyse the literature reviews and identify the research problem (K2, K3, K4)
2. formulate and construct a research plan and carry out the research experiments (K4, K5)
3. produce evidences for the research work using spectral and theoretical data and integrate and analyse the experimental results (K4, K5)
4. interpret the experimental results critically, compare the experimental results with theoretical conceptsand draw conclusions (K4, K5, K6)
5. justify, criticize the research work and present ideas clearly and coherently to defend their research work (K4, K5)

Suggested Area of Research:
Synthetic Organic Chemistry, Coordination Chemistry, Corrosion Studies, Environmental Chemistry, Polymer Chemistry, Phytochemistry, Nanochemistry, Physical Chemistry, Theoretical Chemistry, Material Chemistry.

Research Supervisors will be allotted for each student. A specific problem will be assigned to the students or they will be asked to choose a problem from their area of interest. The topic/area of work will be finalized at the end of III semester, allowing scope for the students to gather relevant literature. The research work can be carried out in the college or at any other organization approved by the guide and the HoD. The project will require practical work with the submission of a project report. It should include experimental lab work or theoretical results derived from software. The duration of the project work is between 3 and 6 months. The project report should be submitted in the prescribed format containing a minimum of 40 pages. The report should be enhanced with graphs, spectra, tables and/ or photographs.

Each candidate must prepare 4 hard copies of the thesis - 1 copy for the candidate and 3 copies for the department. The project should be submitted on the scheduled date prescribed by the Department. Upon submission of the project report to the office of the Controller of Examinations, the viva-voce examination will be conducted by the supervisor, Head of the Department and an external expert suggested by the supervisor. In the absence of internal examiner, Head of the Department can act as internal examiner. The Project report and the viva-voce will be evaluated for 100 marks (50 internal + 50 external).

Methodology: Each project should contain the following details:

- Brief introduction on the topic
- Review of Literature
- Materials and Methods
- Results and Discussions – evidences in the form of figures, tables and photographs
- Conclusion / Summary
- Bibliography

Course Outcomes (COs)

On completion of the course, students will be able to

CO1:   review and analyse the literature reviews and identify the research problem

CO2:   formulate and construct a research plan and carry out the research experiments

CO3:   produce evidences for the research work using spectral and theoretical data and integrate and analyse the experimental results

CO4:   interpret the experimental results critically, compare the experimental results with theoretical concepts and draw conclusions

CO5:   justify, criticize the research work and present ideas clearly and coherently to defend their research work

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	2	3	3	2	2	-	-	-	25
	2	3	2	2	2	2	2	2	2	3	2	-	-	2	24
	3	2	3	2	3	2	3	2	2	2	3	2	-	2	28
	4	3	3	3	3	2	2	2	2	3	2	2	-	2	29
	5	3	2	3	3	2	2	2	2	3	2	2	-	2	28
Grand total of COs with PSOs & POs															136
Mean value of COs with PSOs & POs = 136/57															2.39

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			2.39
Observation	COs of Project strongly related with PSOs and POs		

DEPARTMENT OF
RURAL DEVELOPMENT SCIENCE

DEPARTMENT OF RURAL DEVELOPMENT SCIENCE
M.Sc. Dairy Science and Rural Management

SEM	Category	Sub.Code	Paper	Hours	Credits
I	Core	22PDMC11	Livestock Production Techniques	4	3
		22PDMP11	Livestock Production Techniques - Practical	2	2
		22PDMC21	General Microbiology	4	3
		22PDMP21	General Microbiology - Practical	2	2
		22PDMC31	Principles of Rural Management	6	5
		22PDMC41	Research Methodology	6	5
	Core Elective	22PDME11	IRD Practical – 1	6	4
	Total			30	24
II	Core	22PDMC52	Dairy Chemistry and Dairy Microbiology	4	3
		22PDMP32	Dairy Chemistry and Dairy Microbiology – Practical	2	2
		22PDMC62	Soil and Fodder Management	4	3
		22PDMP42	Soil and Fodder Management – Practical	2	2
		22PDMC72	Social Statistics and Computer Applications	6	5
	NME*	22PDMN12	Social Problems and Intervention Strategies	4	4
	Core Elective	22PDME22	IRD Practical – 2	6	2
		22PDMI12	Block Placement		2
		22PLFS12	Life Skills	2+2*	2
			MOOC / SWAYAM		2**
	Total			30	25
III	Core	22PDMC83	Entrepreneurship Development	4	3
		22PDMP53	Entrepreneurship Development – Practical	2	2
		22PDMC93	Watershed Management	4	3
		22PDMP63	Watershed Management - Practical	2	2
		22PDMD03	Dairy Products and Packaging -I	4	3
		22PDMP73	Dairy Products and Packaging -I Practical	2	2
		22PDMD13	ICT for Rural Development	6	5
	Core Elective	22PDME33	IRD Practical – 3	6	4
			MOOC / SWAYAM		2**
	Total			30	24 + 2**
IV	Core	22PDMD24	Dairy Products and Packaging -II	4	3
		22PDMP84	Dairy Products and Packaging II- Practical	2	2
		22PDMD34	Energy and Environment	4	3
		22PDMP94	Energy and Environment - Practical	2	2
		22PDMD44	Project Work	12	5
	Core Elective	22PDME44	Dairy Business Management	6	4
	Total			30	19
	*NME (Non-Major Elective is offered to the students of other Disciplines)				

Semester	I	II	III	IV	Total	Extra Credit
Credit	24	25	24	19	92	4**

Self-Learning Courses :
(By MHRD, Govt. of India)
* represents practical outside the class hour
** Extra Credit Course
MOOC/SWAYAM (2 credits for each course, maximum of 2 courses)
1. **MOOC – SWAYAM – I (I Year - II Semester) syllabus**
2. MOOC – SWAYAM – II (II Year – III Semester) syllabus

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE

Class	: II M.Sc., DSRM	Part : Core- Elective-4
Semester	: IV	Credit : 4
Sub.Code	: 20PDME44	Hours : 60

Dairy Business Management

Educational Course Objectives

1. To make the students to understand the basic economic concepts of Dairy farm.
2. To impart knowledge on dairy management practices.
3. To prepare young minds and enthusiastic students to start Dairy related enterprises.
4. To gain organizational skills involved in functioning the Dairy cooperative societies.
5 To inculcate and motivate the students to apply the marketing strategies and financial management.

Unit- I Introduction   (10 Hours)

Definition, Concepts, Characteristics of Dairying, Scope, Importance and Principles of Dairying, Economic Viability for different sizes of Dairy Enterprises, Various Economic Principles to support the Dairy Industries.

Unit –II Milk Procurement   (10 Hours)

Planning for Milk Collection, Mode Milk procurement, Measures to enhance Milk Procurement during Lean season, Strategies to improve Milk Procurement, transportation routes, system of milk Pricing, Pricing of milk and Milk products.

Unit –III Dairy Development Programmes   (10 Hours)

Dairy Development Programmes. White Revolution- Aims and Achievements-Impact on Individual Dairy Farmers, National Technology Mission for Dairy Development.

Unit- IV Dairy Cooperatives   (15 Hours)

History of Cooperative Movement in India, Cooperative Movement in Dairy Industry. Milk Cooperatives, Functioning of Private Milk owners and their cost benefit analysis, Roles and functions of District Milk Union. Role of State Milk Cooperative Federations, Records and Registers in a Milk Society, Coordination with other Institutions concerned with Dairy Development. Role of insurance and its importance.

Unit –V Marketing and Dairy Accounts   (15 Hours)

Definition, concept, Nature, importance and Principles of Marketing. E-Marketing, Determinants, Purchase and sales of Milch Animals, Marketing Strategies for Milk and Milk Products, Role of Advertisement for Market Promotion, Analysis of Consumer Demand and Acceptance, General Principles of Account Keeping, Single and Double Entry System, Maintenance of Financial Records, Preparation of Balance Sheet Auditing.

Books for Reference

Jagdish Prasad, 2016   Principles & Practices of Dairy Farm Management.

Bath Donald & Others, 1985 Dairy Cattle Principles, Practice, Problems and Profit Philadelphia Publication.

R.S.Gupta, 1995 Book Keeping & Accounts –. Sulthan Chand Publication.

Nataraj, B.S. 2007. Marketing of Milk and Milk Products: Opportunities for Entrepreneurship. In: Souvenir, National Workshop on Entrepreneurship Development in Dairy and Food Industry, NDRI, Karnal,

Pandey, I.M. 2004. Financial Management.9th ed. Vikas Publ. House. New Delhi.

Dairy India Year Book. 2007. P.R. Gupta Publ., New Delhi.

E-Resources

http://www. business@mapsofindia.com

http://www.technopark.com.

http://www.nddb.org

http://www.dahd.nic.in/dahd/reports/compendium-of-schemes.aspx

http://www.123helpme.com/producer-company-concept-view.asp?id=166965

http://ecoursesonline.iasri.res.in/mod/page/view.php?id=4864

Teaching Learning Methods

- PPT Presentations.
- Lab Practical
- Hands on Training
- Video Presentations
- Record Work

C.O.NO.	Course Outcome	Knowledge level upto
1	Learn the economic importance of dairy enterprises	
2	Able to undertake routine operation in the Dairy farm.	**K2**
3	Explore the avenues and programmes that facilitate the dairy enterprises.	**K3**
4	Guided to establish dairy farm and encourage to register their own Dairy farm with the prevailing Government Schemes	**K4**
5	Acquired practices to market the Dairy products and maintain the accounts.	**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
CO1	3				2				3	2	2	2	3	17
CO2	3		3	2	2				3	2	2	2	3	22
CO3	2		3	2	2				3	2	2	2	3	21
CO4	2		3	2			3		3	2		3	3	21
CO5	2		3	2			3	2	3	2			3	20
Grand Total of COs with POs & PSOs														101
Mean Value of COs with POs & PSOs = $\dfrac{Grand\ Total\ of\ Cos\ with\ POs\ \&\ PSOs}{Number\ of\ Cos\ relating\ with\ POs\ \&\ PSOs} = \dfrac{101}{40}$														2.52

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			**2.52**
Observation	COs of DAIRY BUSINESS MANAGEMENT are strongly correlated with POs & PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE
VALUE ADDED COURSES

Semester   : III

HERBAL MEDICINE

Course Educational Objectives

❖ To import develop skill in identification of traditional system of medicine.
❖ To enable the students to understand the medicinal value of some medicinal plants.
❖ To learn the economic importance and useful parts of medicinal plants.
❖ To capacity the students to understand herbal preparation and extraction of medicinal plants.
❖ To develop skill in marketing techniques and supply management

Unit:-I

Traditional systems of medicine

Traditional systems of medicine–AYUSH. Ethnomedicine with reference to Tamil Nadu. Classification of medicinal plants on the basis of morphology and pharmacology.

Unit-II

Morphology and medicinal uses

Study of the following medicinal plants with special reference to Botanical name, Family, morphology of the essential part and medicinal uses of Turmeric, Aloe, Vetiver, Black cumin, Saffron, Kattunelli and Kasakasa.

Unit-III

Economic importance of medicinal plants

Economic importance: Study on the morphology, essential parts, method of use for specific ailments of the following: rhizome (Acorus, Ginger), Bulb (Garlic, Onion), Root (Hemidesmus, Vinca), Bark (Saraca, Cinnamomum), Leaf (Adhatoda, Vitex), Flower (Cassia, Clove), Whole plant (Phyllanthus, Azadirachta).

Unit -IV

Herbal preparation and Extraction methods

Herbal preparation: decoction, infusions, essential oils, shampoos, powders. Extraction methods and medicinal uses of following volatile oils: Jasmine oil, Sandal wood oil, Clove oil and Lemon grass oil.

Unit -V

Entrepreneurship and Marketing techniques

Entrepreneurship opportunity, Necessity to promote Indian Traditional health Concept, Demand and opportunity for Herbal products Retailing, Marketing techniques Sales and Promotion, Customer Service, Demand and Supply management.

Practical:

1. To identify and to study the medicinal value and the morphology of the essential parts in the plants specified in the syllabus.
2. Preparation and extraction of medicinal plants
3. To identify essential oils and their medicinal values specified in the syllabus.
4. Phtyochemical analysis of medicinal plants
5. Field visit and observation of herbal garden
6. To maintain a record notebook for external evaluation

Book for References:

1.Gala, D.R. Dhiren Gala & Sanjay Gala. 2000. Nature cure for common diseases, Navneet Publications Ltd., Mumbai.

2.John Jothi Prakash.E. 2003, Medicinal and Aromatic plants. JPR publications, Neyyoor.

3.John Jothi Prakash.E. 2004, Medicinal Botany and Pharmacognosy. JPR publications, Neyyoor.

4.Vaidya Bhagwandush, B. 1999, Herbal cure. Jain publishers, New Delhi.

5.Yoganarasimhan. 2000, Medicinal plants of India, Cyber media, Bangalore.

6.Textbook of Pharmacognosy by C. K. Kokate, Purohit, Ghokhale, Nirali Prakashan

7.Cultivation of Medicinal Plants by C.K. Atal & B.M. Kapoor.

E-contents

https://www.youtube.com/watch?v=IguJZgpBg4U

https://www.youtube.com/watch?v=zV9X8IyK9e0

https://www.youtube.com/watch?v=xvakf3P3yoA

https://www.youtube.com/watch?v=zVMylD7GZ4o

https://www.youtube.com/watch?v=H_2et6m1AQM

Teaching and learning methods

- Class Lecture
- Digital Presentation
- Practical model demonstration
- Field visit and observation of herbal science
- Learning through exposure

Course outcome

S. No	Course outcome	Knowledge level (Bloom's Taxonomy)
CO1	To discern knowledge of traditional medicinal system.	K1
CO2	To know and understand the botanical name, Family, morphology, essential parts and medicinal uses of various spices.	K2
CO3	To illustrate and articulate the morphology of the essential part and uses of various medicinal plants	K2

CO4	To learn and infer about the extraction of medicinal oils	K3
CO5	To develop skill in marketing techniques, customer Service and supply management	K4

K1 = knowledge; K2 = Understanding; K3 = Application; K4 = Analysis; K5 = Synthesis & Evaluation

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 COs with POs & PSOs
CO1	3	3	2	2	2	3			3	2			2	22
CO2	3	2	2		3	2			3	2				17
CO3	3	2	3	2	2		2	3		3	2			22
CO4	3	3	2	2	3			2	3		2			20
CO5	3	3	2	3	2	3			3	2		2		23
Grand Total of COs with POs & PSOs														104
Mean Value of COs with POs & PSOs = = 104/42														2.47

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			**2.47**
Observation	**COs of Herbal Sciences are strongly correlated with POs & PSOs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF RDS
VALUE ADDED COURSES
Ornamental Fish culture

Semester IV

Course Educational Objectives

- To inculcate importance of ornamental fish farming in relation with entrepreneurship development.
- Study about different species of exotic and indigenous ornamental fishes and their feeds
- To learn about construction, set up and maintenance of ornamental aquarium fish tanks,
- Study about breeding of selected species of live bearers and egg laying fishes.
- Study about health and disease management in ornamental fishes.

Unit 1   **15 hours**

Introduction to aquaculture-definition and scope- History of aquaculture: Present global and national scenario - World trade of ornamental fish and export potential

Unit 2   **15 hours**

Varieties of exotic and indigenous ornamental fishes-Aquarium types and aquarium accessories - Profile of selected ornamental fishes in world- knowledge and profile of selected indigenous Indian ornamental fishes-Live and synthetic fish feeds for maintenance of ornamental fish.

Unit 3   **15 hours**

Constructionof ornamental fish tanks- setup and maintenance of aquarium tanks - Engineering aspect in ornamental fish tank construction-Water filtration system types - biological, mechanical and chemical- Types of filters and accessories.

Unit 4   **15 hours**

Breeding of live bearer ornamental fishes.- Guppies, Mollies and Swordtail fish - Breeding of selected egg layer ornamental fishes -Goldfish, Zebrafish, Tetras and Barbs - hatchery management system for live bearers and egg laying fishes.

Unit 5   **15 hours**

Ornamental fish diseases and symptoms- Health management and medicines used in ornamental fish farms and aquariums.

Practicals:

Identification of live bearers and egg laying ornamental fishes - Profiling of selected ornamental fishes using online sources – Demonstration of breeding in live and ornamental fishes – Demonstration of aquarium tank construction – Identification of fish diseases and management.

References:

- Hand Book of Fresh Water Fishes of India By Beaven C.R. – Narendra Pub. House.
- Text Book of Fish Biology and Indian Fisheries By Dr. R. P. Parihar, Central Pub. House,
- Aquaculture – Principles and Practices by Pillay,T.V.R
- Fish & Fisheries by Chandy – National Book Trust.
- Fish & Fisheries in India – By Jhingran V.G. – Hindustan Pub. Corporation – New Delhi.

Online Sources:

https://www.fishbase.de/home.htm
https://www.catalogueoflife.org/data/dataset/1010
https://www.thesprucepets.com/diy-glass-aquarium-plans-2924662
https://www.youtube.com/watch?v=mGmIvhtIM9k
https://www.aquariumsindia.com/best-aquarium-fishes-for-beginners/

Teaching and learning methods

- Class Lecture
- Digital Presentation
- Practical model demonstration
- Field visit to Aquarium dealers and breeders
- Learning through exposure
-

Course outcome

S. No	Course outcome	Knowledge level (Bloom's Taxonomy)
CO1	To discern knowledge of ornamental fish culture in relation entrepreneurship	K1
CO2	To know and understand the different species of exotic and ornamental fishes and their feeds	K2
CO3	To develop skill in construction and maintenance of Aquarium fish tanks	K2
CO4	To learn and infer about breeding of selected ornamental fishes	K1
CO5	To develop skill in marketing techniques, customer Service and supply management	K1

K1 = knowledge; K2 = Understanding; K3 = Application; K4 = Analysis; K5 = Synthesis & Evaluation

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 COs with POs & PSOs
CO1	3	3	2	2	2	3			3	2			2	22
CO2	3	2	2		3	2			3	2				17
CO3	3	2	3	2	2		2	3		3	2			22
CO4	3	3	2	2	3			2	3		2			20
CO5	3	3	2	3	2	3			3	2		2		23
Grand Total of COs with POs & PSOs														104
Mean Value of COs with POs & PSOs = = 104/42														2.47

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			**2.47**
Observation	**COs of ornamental fish culture are moderately correlated with POs & PSOs**		

DEPARTMENT OF
FOOD SCIENCE & TECHNOLOGY

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

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

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: Imparting knowledge on the field of Food Science, Nutrition, Food Engineering, Food Marketing and Food Technology.

PSO2: Proficiency in culinary skills and to describe role of ingredients in food during food preparation.

PSO3: Enables to understand food composition and its nutritional, chemical and microbiological aspects and effects of common food preparation methods and food storage conditions on survival and growth of microbial contaminants.

PSO4: Familiarize the students with the technology of pulses, oilseeds, spices, fruits, meat products processing and preservation.

PSO5: Emphasize the importance of food safety, food quality, food plant sanitation, food laws and regulations and food engineering

B.Sc., Food Science and Technology

(Under Choice-Based Credit System from the Academic year 2022-2023 onwards)

PART	SUB. CODE	PAPER	Hrs	Cr
		I SEMESTER		
I	22UTML11/ 22UHNL11/ 22UFNL11	Tamil/ Hindi/ French	6	4
II	22UENB11	English through Prose & Short Story (Stream B)	5	4
III	22UFSC11	Core-1Principles 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-1Principles of Food Production	3	3
	22UFSQ11	Allied Lab-1Food 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		-
		Total	**30**	**24**
		II SEMESTER		
I	22UTML22/ 22UHNL22/ 22UFNL22	Tamil/ Hindi/F rench	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
		Total	**30**	**24**
		III SEMESTER		
III	22UFSC53	Core-5Food Engineering	5	4
	22UFSC63	Core-6 Technology of Cereal Grains, Pulses, and Oilseeds	5	4
	22UFSP33	Core Lab-3 Food Engineering & Technology Cereal Grains, Pulses and Oilseeds and Food Safety Lab	4	2
	22UFSC73	Core-7 Food Safety and Toxicology	4	3

	22UFSA33	Allied-3 Bakery and Confectionery Products	3	3
	22UFSQ33	Allied Lab -3 Bakery and Confectionery 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		
		Total	**30**	**22**
IV SEMESTER				
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, Vegetables 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
		Total	**30**	**24**
V SEMESTER				
	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 Lab	4	2
III	22UFSD35	Core-13 Food Quality Testing and Evaluation	6	6
	22UFSP65	Core Lab-6 Food Quality Testing Lab	3	2
	22UFSE15	Core Elective1–Food Quality Management /Food Laws and Regulations	4	3
IV	22USSI16	Soft Skill	2	
		Total	**30**	**24**
VI SEMESTER				
	22UFSD46	Core14 Technology of Sea Foods	6	6
	22UFSP76	Core Lab-7 Technology of Sea Foods Lab	3	2

	22UFSD56	Core 15-Project Management and Entrepreneurship	5	5
III	22UFSD66	Core16-Project Work/In-Plant Training	10	8
	22UFSE26	Core Elective–2 Food Product Development & Marketing/Food Packaging and Labelling	4	3
IV	22USSI16	Soft Skill	2	2
		Total	**30**	**26**

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 Processing	3
VI	22UFSSL6	Food Laws and Regulations	3

Carrier-Oriented Courses

Sem	Sub. Code	Title of the Course	Credits
III		Life Cycle Nutrition	-
IV		Dietetics	-

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code & Title	Food Engineering (22UFSC53)		
Class: II FST	Semester III	Hours-75	Credit-4
Course Educational Objective	The course aims at enabling the students to gain knowledge on various food processing operations and the engineering concepts behind the processing techniques.		

Unit	Content	No. of Hours
I	Introduction-Concept of Unit operation-Units and dimensions – Mass, weight, Volume, density and specific gravity, dimensional analysis, Mass and Energy Balance. Design of food plant-Important considerations for designing of food plants – Construction and design-Types of layout. Grinding and mixing-Principle and equipment used in food industry.	15
II	Fluid Flow in Food Processing. Liquid Transport systems. Properties of Liquids. Newton's Law of Viscosity. Principle of capillary tube androtationalviscometer.NewtonianandNon-Newtonianfluids–Properties. Flow characteristics, Reynolds Number, Bernoulli's Equation. Principles of Flow Measurement devices.	15
III	Refrigeration and Freezing- Concept and selection of a refrigerant. Description of a Refrigeration cycle. Pressure Enthalpycharts and Tables. Application of Plank's equation to specific food system. Frozen food storage.	15
IV	Heat and Mass Transfer. Systems for heating and cooling food products. Thermal Properties of Food Modes of heat transfer. Application of steady state heat transfer, over all heat transfer coefficient. Design of tubular heat exchanger.	15
V	Psychrometrics - Properties of Dry Air, water vapour. Psychrometric Chart. Steam, Evaporation and Dehydration - Generation of steam. Construction and functions of fire tube and water tube boilers. Boiling point elevation. Types of evaporators. Basic Drying Process -Moisture content on wet basis and dry basis. Dehydration systems.	15
Text books	1. Rao, D. G. (2010). Fundamentals of Food Engineering. PHI Learning Pvt. Ltd.. 2. Paul Singh, R., & Heldman, D. R. (2009). Introduction to Food Engineering. 3. Dennis R. Heldman (2019). Handbook of Food Engineering. CR Press. 3rdRevised edition.	
Books for Reference	1. Rao, C. G. (2006). Essentials of Food Process Engineering. BS Publications. 2. Dr. B. Sreenivasula Reddy. (2021). Textbook of Food Engineering. Indian Council for Agriculture and Research. 3. Lozano, J. E., Anon, C., Barbosa-Canovas, G. V., & Parada-Arias, E. (2000). Trends in food engineering. CRC Press.	

Course Outcome

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGELEVEL (Bloom'sTaxonomy)
CO1	Understand and explain the various food plants and Basic Unit Operations in various Food Industries	K2
CO2	HaveIn-depth knowledge about the fluid properties and Its application in food Industry	K3
CO3	Explain about Refrigeration cycles and its derivations with application in Food Industry	K4
CO4	Correlate about mode and nature of heat transfer and its application in food Industry.	K3
CO5	Understand about water vapour mixture and how it has Been used in Food Industries.	K2

K1=Remembering, K2=Understanding, K3=Application, K4=Analysis and K5=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	
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
Grand Total of COs with PSOs and POs **Mean Value of Cos with PSO and POs** =---=(122/51) **Number of Cos relating with PSOs and POs**														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	**COs of Food Engineering related to a strongly extent with PSOs and POS**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code & Title	Technology of Cereal Grains, Pulses, and Oilseeds (22UFSC63)		
Class : II UG	Semester III	Hours - 60	Credit - 4
Course Educational Objective	The course enables the students to acquire knowledge and skills on cereals, pulses and oil seeds processing and the equipments involved in the processing operations.		

Unit	Content	No. of Hours
I	Technology of Cereals: Wheat -Types, Physiochemical properties, milling, flour grade, flour treatments -bleaching, maturing, types of flour for baking, technology of dough development, Macroni products. Rice -Physicochemical properties, milling - mechanical & solvent extraction, parboiling, Rice products and utilization of by-products.	12
II	Technology of Cereals and Millets: Corn - Milling (wet and dry), cornflakes. Barley- Milling, Malting, Processing of beer. Oats - Milling (oatmeal, oat flour& oat flakes). Technology of millets: Millets -Major millets –Pearl Millet, Sorghum, Finger Millet and Foxtail Millet – Milling Minor Millets –Kodo Millet, Proso Millet, Little Millet, Banyard Millet – Milling. Uses of Millets.	12
III	Technology of Pulses& Oilseeds: Red gram, Green gram, Black gram - Milling (Dry & wet), Improved milling method. Anti-Nutritional factors in pulses. Technology of Oilseeds: Oil Extraction methods, Refining of Oil, Rancidity of oil. Soya Products - Defatted flour, Protein Concentrates and Isolates, Texturized vegetable protein – Definition.	12
IV	Equipments used for cereals, Pulses and Oilseeds processing: Principles and Application of: Dryers- Solar Dryer, Fluidized Bed Dryer, Spray Dryer, Cabinet Dryer Milling Equipments- Rubber Roll Sheller, Pin Mill, Hammer Mill Seperators- Gravity separator, Intended Cylinder Seperator, cyclone separator Single screw extruder and Twin screw extruder Oilseeds - Seed sheller, Filter press, Oil Refinery unit	12
V	Storage of Cereal grains , Pulses and Oilseeds: Packaging materials and methods of packaging, Different types of storage structure, biochemical changes during storage, losses due to insects and rodents.	12
Textbooks	1. Avantina, Sharma. (2018) Textbook of Food Science and Technology. CBS Publishers. 2. Srilakshmi, B. (2018). Food Science. New Age International, 5, 328-329. 3. Earle, R. L. (2013). Unit operations in food processing. Elsevier. 4. Manay S, Shadaksharaswami M. (2004). Foods—Facts and Principles. New Delhi, India: New Age International Publishers. 5. Barr, S. (2019). Technology of cereals, pulses and oilseeds. Scientific e-Resources.	

Books for Reference	1. Marshall, W. E., and Wadsworth, J. I. (1994). Rice Science and Technology. Marcel Dekker: New York. 2. Owens, G. (Ed.). (2001). Cereals processing technology (Vol. 53). CRC Press. 3. Kulp, K., & Ponte, J. G. (2000). Handbook of cereal science and technology. CRC Press. 4. Kudra, T., & Raghavan, G. S. V. (1991). Post Harvest Technology of Cereals Pulses and Oilseeds: Oxford IBH Publishing Co. Pvt Ltd. New Delhi, 1988. Drying Technology, 9(2), 527-528.

Course Outcome

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO$_1$	Acquire knowledge about cereal and cereal products processing	K2
CO$_2$	Learn about the processing of millets	K1
CO$_3$	Understand about the processing of pulses and oilseeds	K2
CO$_4$	Gain Knowledge on various equipments involved in food processing	K2
CO$_5$	Understand about various technologies involved in packaging and storage of cereal grains, pulses and oilseeds.	K2

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K$_5$= 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		1	3	2	21
CO2	3	3	1	3	3		2	3	3		1	3	3	28
CO3	3	3		2	3	3		3	3		2	3	2	27
CO4	3	3		3	3	3	3		3		3	3	2	29
CO5	3	3		2	1	3			3		2	3	2	22
Grand total of COs with PSOs and POs														127
Grand Total of COs with PSOs and POs **Mean Value of COs with PSO and POs** = -- = **(127/ 48)** **Number of COs relating with PSOs and POs**														**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	**COs of Technology of Cereals Pulses and Oilseeds related to a strongly extent with PSOs and POs**		

Course Code &Title	Food Safety and Toxicology (22UFSD25)			
Class	III-FST	Semester III	Hours-90	Credit-6
Cognitive Level	**K-1** Knowledge **K-2** Understanding **K-3** Application			
Course Educational Objective	The course aims at enabling the students to gain knowledge on various hazards that affect foods and management of hazards			

UNIT	Content	No. of Hours
I	**Food Safety:** Introduction and Definition, Factors affecting Food Safety. Importance of Safe Foods. FSSAI. **Food Hazards**-Definition and Types of Food Hazards-Physical, Chemical and Biological. Impact on health. Control measures.	18
II	**Biological Hazards:** Introduction, Indicator Organisms. Food borne pathogens: bacteria, viruses, eukaryotes, parasites and mycotoxins. Basic steps in detection of food borne pathogens. Water Analysis.	18
III	**Microbiological Criteria** –Microbial Risk Assessment (MRA). Sampling techniques of Microbial analysis. Microbiological standards and limits (processed food, water). Microbiological Assessment of various categories of food-Meat and Meat Products, Dairy, Fruits and Vegetables. Assessment of Surface.	18
IV	**Management of Hazards:** Need, Control Parameters – pH, water, Air, Temperature control. Hygiene and Sanitation in Food Service Establishments -Sources of contamination. Personal Hygiene. Hazard Control methods using physical and chemical agents. Waste Disposal. Pest and Rodent Control. Food Safety Measures.	18
V	**Food Storage, preservation and safety**: Preservation process and food storage. Recent developments in food safety- Food Storage and food preservation aspects.	18
Textbooks	1. Marriott, N. G., Gravani, R. B., & Schilling, M. W. (2006). Principles of food sanitation (Vol. 22). New York: Springer. 2. Lawley, R., Curtis, L., & Davis, J. (2012). The food safety hazard guidebook. Royal Society of Chemistry. 3. Forsythe, S. J. (2020). The microbiology of safe food. John Wiley & Sons.	

Course Outcome

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Learn and Interpret about the basics of food Safety and Hazards	K3
CO2	Detect various Biological Hazard and disease pathogens in food	K4
CO3	Attributes to Hazard Analysis in detail	K3
CO4	Apply knowledge about Safety and Hygiene Measures in food industry	K3
CO5	Detect the recent outbreaks in food safety and food laws	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	3	3	1	3		3	1	3	32
CO2	3	3	1	3	3	3	3		3		3	1	3	29
CO3	3	3	1	3	3	3	3		3		3		3	28
CO4	3	3	2	3	3	3	3		3	3	1	1	3	31
CO5	3	3	3	3	3	3	3	3	3		1		3	31
Grand total of COs with PSOs and POs														151
Grand Total of Cos with PSOs and POs **Mean Value of CoS with PSO and POs** = $\dfrac{\text{Grand Total of Cos with PSOs and POs}}{\text{Number of CoS relating with PSOs and POs}}$ = (151⁄56)														2.7

Strong –3, Medium–2, Low–1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of Cos with PSOs and POs			2.7
Observation	**Cos of Food Safety and Toxicology related to a strong extent with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code &Title	Food Engineering & Technology of Cereal Grains, Pulses and Oilseeds Lab (22UFSP33)		
Class: II UG	Semester III	Hours-60	Credit-2
Course Educational Objective	The course aims at imparting skills on measurement of certain functional properties cereals, pulses and oilseed products and to impart knowledge on engineering properties of foods.		
Content			

Food Engineering Laboratory

1. Food processing Plant layout, Current Good Manufacturing Practices, material of construction and corrosion, waste utilization.

2. Determination of viscosity of Newtonian and non - Newtonian fluids.

3. Effect of temperature on viscosity of food samples.

4. Determination of freezing characteristics in food samples.

Cereals, Pulses and oil seeds Laboratory

5. Physical characteristics of Cereal grains.

     (i) Rice (ii) Wheat (iii) Maize (iv)Sorghum (v)Finger millet (vi) Little millet

6. Moisture content of Cereals Grains, Pulses and Oilseeds

     1. Rice, Wheat, Maize, Pearl Millet, Finger Millet

     2. Red gram, Green gram, Black gram

     3. Gingelly seeds, Sun flower seeds, Mustard seeds

7. Estimation of gluten content of different types of flour.

     1. Whole wheat flour

     2. Refined wheat flour

8. Determination of refractive index of fats and oils

     (i) Ground nut oil (ii)Butter(ii) Gingelly oil

     (iv)Coconut oil   (v)Ghee   (vi)Olive oil

9. Determination of smoke point of different fats and reused oils.

     (i) Groundnut oil(ii)Coconut oil   (ii)Gingelly oil

     (iv) Vanaspathi   (v)Ghee   (vi)Butter

10.   Visit to Food Processing Industry

Food Safety Laboratory

11.   Microbiological examination of different food samples.

12.   Bacteriological analysis of water.

13.   Biochemical tests for identification of bacteria

Course Outcome

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGELEVEL (Bloom's Taxonomy)
CO1	Understand and learning the importance food Processing layout	K2
CO2	Determining therefractiveindexofatsandoils	K3
CO3	Explain about smoking point of oil	K2
CO4	Estimation of physical characteristics of cereals, pulses and oilseeds	K4
CO5	Learn about the industrial processes in relevance with cereal grains, pulses and oilseeds processing	K4

K1=Remembering, K2=Understanding, K3=Application, K4=Analysis 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	2		3	3	1		3		1	3	2	24
CO2	3	3		3	3		2	3	3		1	3	3	27
CO3	3	3	2	2	3		3	3	3	2	2	3	2	31
CO4	3	3		3	3	3	3		3	2	3	3	2	31
CO5	3	3		2	1	3	1	1	3	1	2	3	2	25
Grand total of CoS with PSOs and POs														138
Grand Total of CoS with PSOs and POs **Mean Value of CoS with PSO and POs** =--=(138/55) **Number of CoS relating with PSOs and POs**														**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	**CoS of Technology of Cereals Pulses and Oilseeds related to a strongly extent with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code & Title	Bakery and Confectionery Products (22UFSA33)		
Class: II UG	Semester: III	Hours: 45	Credit : 3
Course Educational Objective	The course aims at enabling the students to gain knowledge on preparation methods and types of bread, cakes, cookies, pies, tarts, chocolate and puff pastry.		

Unit	Content	No. of Hours
I	History of baking. Basic principles of baking. Bakery organization structure. Bakery equipment and their uses. Bakery terms. Raw materials used in Bakery. The Baking process – Formation and expansion of gases. Trapping of gases in air cells. Coagulation of proteins, gelatinization of starches, evaporation of water. Melting of shortenings. Browning of sugar and crust formation. Staling – Protecting the product from air. Adding moisture retainer to the formula. Freezing. Characteristics of good baking	9
II	Breads, dough and fillings. Bread types. Mixing methods – straight dough, modified straight dough method for rich dough, sponge method- Steps in dough production. Fillings & toppings for sweet dough products, Good Quality Bread– Internal and External Characteristics.	9
III	Cakes and Cake decoration. Sponges: Preparation methods, types Icings: Types (Fondant, butter creams, foam. Flat, fudge, royal icing, marzipan, meringues, glazes, fillings). Assembling and icing cakes: Selection of icing, procedure for assembling layer cakes. Factor affecting the quality of cakes. Cake decoration: Colour, design, templates, texture, equipment, casting molds, lettering, monogram, stencils.	9
IV	Cookies, Pies and Tarts. Cookies: Characteristics & causes, mixing methods, types & make-up, panning, baking and cooling, formulas for bar cookies, macaroons, lace cookies, sandwich cookies. Pies: Types, mixing pie dough, pie crust, procedure for making small fruit tarts, assembling, baking & filling, common problems in fruit pies. Tarts & tartlets: Preparation and types	9
V	Puff Pastry and Chocolates. Puff pastry; Preparation and types. Faults in pastry making. Chocolate: Manufacture & processing of chocolate, types & uses of chocolate, cocoa butter, white chocolate, liquor chocolates, fondant chocolates, gummies& toffees.	9
Textbooks	1.Yogambal, A.K. (2018). Bakery and confectionery. PHI Learning Private Limited. 2.Ziegler, G. R., & Talbot, G. (2009). Science and Technology of Enrobed and Filled Chocolate, Confectionary and Bakery Products.	

	3.Philip E Philip, (2003). Modern Cookery: For Teaching and the Trade. Orient Blackswan.
Books for Reference	1. Piper Davis and Ellen Jackson. (2009). The Grand Central Baking Book: Breakfast Pastries, Cookies, Pies, and Satisfying Savories from the Pacific Northwest's Celebrated Bakery, Ten Speed Press.

Course Outcome

S.No.	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Gain knowledge about basic methods used in bakery	K1
CO2	Understand the techniques involved in bread making	K2
CO3	Organize the steps in cake preparation and cake decoration	K3
CO4	Distinguish the preparation of cookies, pies and tarts.	K3
CO5	Have in depth knowledge about puff pastry and chocolate manufacture	K1

K1=Remembering, K2=Understanding, K3=Application, K4=Analysis 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	1		3				3	3				15
CO2	3	3	1	2	3	2			3	3	1	2	1	24
CO3	3	3		2	3	3			3	3		2	1	23
CO4	3	3		2	3	3			3	3		2	1	23
CO5	3	3		2	3	3	1	1	3	3		2	2	26
Grand total of COs with PSOs and POs														111
Grand Total of CoS with PSOs and POs **Mean Value of CoS with PSO and POs** =--=(54⁄46) **Number of CoS relating with PSOs and POs**														**2.4**

Strong –3, Medium–2 & Low–1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of Cos with PSOs and POs			2.4
Observation	**Cos of Bakery and Confectionary Products related to a strongly extent with PSOs and POS**		

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ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Bakery and Confectionary Products Laboratory (22UFSQ33)		
Semester III	**Hours - 30**	**Credit - 1**
• The course aims to provide practical knowledge on preparation and techniques involved in bakery and confectionery products		
Content		
A. Bakery products 1. Bread – White Bread, Wheat Bread, Fruit Bread 2. Cakes – Sponge Cake, Black Forest and Honey Cake 3. Muffins 4. Croissant 5. Danish pastry 6. Cookies 7. Doughnuts 8. Brownies 9. Cheese straws **B. Confectionery Products** 10. Chocolate mousse 11. Chocolate 12. Melting moments 13. Marshmallows 14. Fondant 15. Fudge **C. Visit to a bakery unit**		

Course Outcome

SL.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Gain knowledge about methods used in baking	K1
CO2	Understand the techniques involved in bread making	K2
CO3	Organize the steps in cake preparation and cake decoration	K3
CO4	Distinguish the preparation of cookies, pies and tarts.	K3
CO5	Have in depth knowledge about puff pastry and Chocolate manufacture	K1

K1=Remembering, K2=Understanding, K3=Application, K4=Analysis 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	1		3				3	3				16
CO2	3	3	1	2	3	2	1		3	3	1	2	1	25
CO3	3	3		2	3	3	1	1	3	3		3	3	28
CO4	3	3		2	3	3			3	3		2	3	25
CO5	3	3		2	3	3	1	1	3	3		2	2	26
Grand total of COs with PSOs and POs														120
Grand Total of CoS with PSOs and POs **Mean Value of Cos with PSO and POs** =--=(120⁄49) **Number of CoS relating with PSOs and POs**														2.4

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of Cos with PSOs and POs			2.4
Observation	**Cos of Bakery and Confectionary Products related to a strongly extent with PSOs and POs**		

Strong –3, Medium–2 &Low–1

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code &Title	Non-Major Elective: Basics of Food Science (22UFSN13)		
Class: II BA History, Economics, Philosophy	Semester-III	Hours-45	Credits- 2
Course Educational Objective	• The course aims to inculcate knowledge on basic food groups, nutritive value of foods and it's functions in our body.		

UNIT	Content	No. of Hours
I	Food –Definition, Functions and Classification of Foods based on sources and functions- Basic Five Food Groups - Food Guide Pyramid. My Plate. Different Processing methods.	9
II	Nutrients - Types- Major nutrients (Carbohydrates, Proteins Fat) , Water, Micronutrients (Vitamins A, D, E, K and B Complex Vitamins&C, Minerals-Ca, Fe, I) - Functions and Sources.	9
III	Cereals and Millets - Rice, Wheat, Maize, Ragi, Bajra – Nutritional composition. Pulses –Types and nutritional composition	9
IV	Fruits and Vegetables-Classification based on pigments - Selection of fruits and vegetables- Nutritional value and composition - role of vegetables and fruits in cookery.	9
V	Milk and Milk products –Nutritional composition- Role of Milk in Cookery, Flesh foods- Meat, Fish, Poultry –Nutritional composition and selections. Sugar and Jaggery – Uses.	9
Text Books	1. Avatina Sharma, (2006), Food Facts and Principles, CBS Publishers. 2. Srilakshmi, B. (2018). Food science. New Age International.	
Books for Reference	1. Manay S, Shadaksharaswami M. (2004). Foods—Facts and Principles. New Delhi, India: New Age International Publishers.	

Course Outcome

S.NO	COURSE OUTCOME (After completion of the course, students should be able to)	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Understanding about the basics of Food Science	K1
CO2	Know the Nutrients and their Deficiency Disorders	K1
CO3	Correlate the different food products and their functions	K2

CO4	Understand the role of fruits and vegetables	**K2**
CO5	Get knowledge about the role of Milk and their By-Products	**K1**

K1=Remembering, K2=Understanding, K3=Application, K4=Analysis 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	1		3				3		2	1		16
CO2	3	3	3		3				3		2	3		20
CO3	3	3	1		3	3	2		3		1	2	3	24
CO4	3	3	2	1	3	3			3	1	2	3	1	25
CO5	3	3	2		3	3		1	3		3	2	2	25
Grand total of Cos with PSOs and POs														**110**
Grand Total of Cos with PSOs and POs **Mean Value of Cos with PSO and POs** =--=(110⁄45) **Number of CoS relating with PSOs and POs**														**2.4**

Strong –3, Medium–2 & Low–1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of Cos with PSOs and POs			2.4
Observation	**Cos of Basics of Food Science Products related to a strongly extent with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code &Title	BASICS OF FOOD PREPARATION (22UFSSL3) (Self Learning)		
Class	II-FST	Semester - III	Credits - 1
Cognitive Level	**K-1** Knowledge **K-2** Understanding **K-3** Application		
Course Objective	The course aims to provide the basic knowledge on food preparation and food handling techniques.		
UNIT	**Content**		
I	**FoodPreparation**- Food-Definition, Functions, Basic 5 food group. Preliminary preparations, Methods of mixing foods, Measuring and weighing of Foods, Standard Vegetable Cuts.		
II	**Methods of cooking food**- Cooking-Definition &Objective, Dry heat and Moist heat cooking methods – boiling, steaming, baking, frying, sauteing.		
III	**Basic Cookery**– Role of Cereals, Pulses, Milk & Milk Products, Fruits &Vegetables. Stocks, Soups, Sauces-Thickening Agents. Various role of food in cookery- Thickening agent, leavening agent, Glazing agent, souring agent, Binding agent		
IV	**Bakery & Confectionary**- Baking Process. Pies, Pastries, and Cookies. Cakes and Frosting. Quick Bread, Yeast Bread. Chocolates & candies- Types and Methods. Role of ingredients in baking.		
V	**Safe Food Handling** - Kitchen Fire Prevention Tools and Equipment, Identification and Use of Common Kitchen Tools and Equipment. Manners/Etiquette-Table Setting, Serving Food, Table Manners for Dining,		
Books for Reference	1. Srilakshmi, B. (2018). Food science. New Age International. 2. Philip, T. E. (2003). Modern Cookery: For Teaching and the Trade. Orient Blackswan.		
Course Outcomes	On completion of the course, students should be able to **CO1:**Understand the basics about food and its preparation methods. **CO2:**Know about various methods of cooking. **CO3:**Learn about basics of cookery from different food groups. **CO4:**Get indepth knowledge about bakery and confectionary process. **CO5:**Know the required safety in food handling.		

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	1		2	3	3		3		3	3	1	24
CO2	3	3		2	2	3	3	2	3		3	3	1	28
CO3	3	3		2	3	3	3		3	2	3	3		28
CO4	3	3		1	1	3	3	2	3	2	3	3	2	30
CO5	3	3		1	1	3	3	2	3	1	3	3	1	27
Grand total of Cos with PSOs and POs														137
Grand Total of Cos with PSOs and POs **Mean Value of Cos with PSOs and POs** = ———————————————— =(137∕55) **Number of Cos relating with PSOs and POs**														2.49

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			2.49

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code &Title	Food Processing and Engineering (22UFSC84)		
Class: II UG	Semester: IV	Hours-75	Credit-4
Cognitive Level	K-1 Knowledge K-2 Understanding K-3 Application		
Course Objective	To understand the principles, processing along with its application in food industries and processing units.		

Unit	Content	No. of Hours
I	Important aspects of product and process development Thermal Processing- Thermal Processing Principles & application– Blanching, Pasteurization, Sterilization, Ultra high temp sterilization, Aseptic processing, Canning and bottling.	15
II	Drying- Significance: Natural drying- Solar drying, Artificial drying- Hot air drying, Drum drying, Spray drying, Dehydro freezing, Freeze drying Pretreatments blanching, Sulphuring. Irradiation - Source of ionization irradiation, Dose & Dosimetry, Mode of action, Scope of irradiation.	15
III	Freezing, freezing rate. Quick freezing. Slow freezing. Air blast freezing, Contact freezing, Immersion freezing, Cryogenic freezing. Quality of frozen foods-Retrogradation, Protein denaturation, Freezerburn.	15
IV	Refrigeration and cold storage –Principles and applications, Effect of low temperature on Fresh Fruits, Vegetables, Meat & Fish products, Chilling injury.	15
V	Recent trends in Processing of Food and Food Products-Pulsedelectric fields, High pressure technology, Ohmic heating, Microwave heating, Hurdle technology, 3D Food printing	15
Text Books	1. Sun, D. W. (2014). Emerging technologies for food processing. 2. Ramaswamy, H. S., & Marcotte, M. (2005). Food processing: principles and applications. CRC Press.	
Books for Reference	1. Berk &Zeki, D. B. (2018). Food Process Engineering and Technology, Academic Press. 2. Romeo, Rakesh, & Fabin. (2004). Fundamentals of Food Process and Engineering. Springer.	

Course Outcome

After completion of the course, students should be able to do

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Explain the various thermal processing Methods	K2
CO2	Understand the various drying process and its application in Food Industry	K2
CO3	Describe the various freezing techniques used in Food Industry.	K3
CO4	Interpret the preservation and fermentation methods.	K2
CO5	Outline the emerging thermal processing methods used in Food Industry	K3

K1=Remembering, K2=Understanding, K3=Application, K4=Analysis 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	1		1	2	2		1	3	2	18
CO2	2			2	1		1	2	2		1	3	2	16
CO3	2			3	2	1	2	2	2		2	2	2	20
CO4	2			3	1		1	2	1		1	2	2	15
CO5	3			3	1		1	2	1		2	3	2	18
Grand total of COs with PSOs and POs														87
Grand Total of Cos with PSOs and POs **Mean Value of Cos with PSOs and POs** =---=(87/46) **Number of Cos relating with PSOs and POs**														1.89

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		1.89	
Observation	**CoS of Food Processing and Engineering 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 Fruits, Vegetables and Plantation Crops(22UFSC94)			
Class: II UG	Semester: IV	Hours-60	Credit-3	
Course Objective	To provide knowledge about basic preparation, processing and preservation of Fruits, vegetables and Plantation crops.			

UNIT	Content	No. of Hours
I	Fruits and Vegetables Production at Global, National and Regional level, Food Preservation-Definition, Principles and Methods of Preservation – Preservation by High temperature, Low temperature,Chemicals,Drying,Carbonation,Fermentation,Antibiotics, Irradiation,Canning and Natural Preservatives. Food Spoilage – Definition and Causes- Microbial Spoilage, Enzymatic Spoilage, Spoilage by insects and rodents, Characteristics and Storage conditions of food and Spoilage by Mechanical damage.	12
II	Fruit Products: Fruits Beverages-Processing of Fruit juices. Preservation of Fruit juices - Pasteurization, Chemical preservation, Freezing, Drying, Tetra-packing and Carbonation. Jam, Jelly, Marmalade, RTS (Ready to serve), Squash, Crush, Cordial, Nectar, Concentrates and Fruit Powder – essential constituents, Processing, FSSAI Specification. Role of pectin, Determination of pectin. Defects in jam and jelly.	12
III	Vegetable Products- Processing Tomato products – Processing of tomato juices, Tomato puree, Paste, ketchup, sauce and soup. Other vegetable products – Pickles, Chutney, Sauerkraut, Kimchi, Vegetable papad– processing Canning of vegetables – Processing.	12
IV	Dehydration of fruits and vegetables-Sundrying of different fruits, Mechanical dehydration-process variation of fruits and vegetables. Packing and Storage–Heat treatment and Fumigation.	12
V	Technology of Plantation Products - Spices -Processing of major and minor spices, Essential oils & Oleoresins. Tea Processing-Black tea, Green tea, Oolong tea. Coffee Processing, Coffee Making - Percolator coffee, Vacuum coffee, Drip Coffee, Steeped coffee, Espresso coffee, Iced coffee. Cocoa Processing - Cocoa powder, cocoa butter and Chocolate.	12

	1.	Manay S, Shadaksharaswami M. (2004). Foods—Facts and Principles. New Delhi, India: New Age International Publishers.
Text books	2.	Afoakwa, E. O. (2016). Chocolate science and technology. John Wiley & Sons.
	3.	Sinha, N. K., Hui, Y. H., Evranuz, E. O., Siddiq, M., & Ahmed, J. (2010). Handbook of vegetables and vegetable processing. John Wiley & Sons.
Books for Reference	1.	W.B.Crusess. Commercial Unit and Vegetable Products. W.V.Special Indian Edition, Pub:Agrobios, India.
	2.	Girdharilal, Siddappaa,G.S and Tandon,G.L. (1988). Preservation of fruits & Vegetables, ICAR, New Delhi.

Course Outcome

After completion of the course, students should be able to

S.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Understand Food Preservation and Food Spoilage	K2
CO2	Have In-depth knowledge about the Processing of Fruit Beverages and Tomato products.	K4
CO3	Explain about the types, processing & technology involved in the preparation of Jam, Jelly and Marmalade	K3
CO4	Correlate the Dehydration of fruits and vegetables and its Packaging and Storage	K3
CO5	Understand about the Technology of Plantation Products-Spices, tea, coffee and cocoa.	K2

K1=Remembering, K2=Understanding, K3=Application, K4=Analysis 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	2	1	2					2	2		1	3	2	15
CO2			1	3			3	1	2		1	3	2	16
CO3	1			2	2			1	2		2	2	2	14

CO4		2		3	1		3	1	1		1	2	2	16
CO5		3		2	1	2		1		1		2	3	2	17

Grand total of COs with PSOs and POs	78

Grand Total of Cos with PSOs and POs **Mean Value of COs with PSOs and POs** =--=**(78⁄42)** **Number of COs relating with PSOs and POs**	**1.85**

Strong –3, Medium–2 & Low-1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of Cos with PSOs and POs		1.85	
Observation	**CO of Technology of Fruits Vegetables and Plantation Crops related to a medium extent with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code &Title	Dairy Technology (22UFSD04)		
Class: II UG	Semester: IV	Hours-60	Credit-4
Course Objective	• The main objective is to gain knowledge about basic processing of milk and milk products. This helps to develop better understanding about composition, Nutritive value and quality of milk		

Unit	Content	No. of Hours
I	Milk - Definition, different milking breed, milk production in global and national level, composition of milk, important characteristics of major constituents of milk i.e. milk fat, milk proteins, lactose and minerals and minor constituents of milk. Factors affecting the quality and quantity of milk produced by milk animals. Physical, chemical and nutritive properties of milk. Effect on Milk during processing	12
II	Market Milk-Brief introduction to Standard milk, Toned milk, Double toned milk, flavored milk, Vitamin enriched milk, Reconstituted milk, Skimmed milk and Recombined milk. Legal and ISI standards of milk. Adulterations of milk and its detection. Common preservatives used in milk and their detection. Collection, transportation and distribution of milk. Clean milk production.	12
III	Milk Processing-Processes of straining, Filtration and clarification. Standardization-Definition of standardization, purpose and uses of standardization process. Homogenization Definition, Effect of homogenization of milk. Uses of homogenization and Checking the effectiveness of homogenization. Pasteurization in milk: Purposes and objects of pasteurization – LTLT, HTST &UHT processes of pasteurization. Test for Milk. Equipments involved in milk processing-Homogenizer, Pasteurizer, Paneer Press, Centrifugal separator, Batch Freezer – Principles and applications.	12
IV	Milk Products- Cream-Different types, Composition and Preparation. Cheese – Classification, Commercial Preparation methods of cheddar cheese, Different processing method of Cheese. Processing of Paneer, Khoa, Butter and Ghee, Microorganism in Milk processing	12

		Ice cream- Different types of ice creams and their composition. Ingredients used and their role in processing. Defects in ice cream.	12
V		Indigenous milk products – Preparation of Kulfi, Srikhand&Lassi. Processing of condensed milk and milk powder, By-products of Milk processing – Whey, Butter Milk and Ghee residue	
Textbooks		1. Patange, D. D., & Kamble, D. K. (2018). Text Book on Milk and Milk Products. Jaya Publishing House. 2. Robinson, R. (2012). Robinson: Modern Dairy Technology: Volume 1 Advances in Milk Processing. Springer Science & Business Media. 3. Robinson, R. K. (2012). Modern dairy technology: Volume 2 advances in milk products. Springer Science & Business Media.	
Books for Reference		1. Warner JN. (1976). Principles of Dairy Processing. Wiley Science Publishers, USA. 2. Singh, S. (2014). Dairy Technology-Vol. 02: Dairy Products And Quality Assurance (Vol. 2). New India Publishing.	

Course Outcome

After completion of the course, student should be able to do

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Acquire knowledge on basics of dairy technology.	K2
CO2	Distinguish types of market milk with preservatives and adulterants.	K3
CO3	Explain standardization, Homogenization, and pasteurization of milk	K4
CO4	Gain knowledge on the processing of cheese, butter, and ghee	K2
CO5	Outline the steps in the preparation of various types of ice cream.	K3

K1=Remembering, K2=Understanding, K3=Application, K4=Analysis 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	2	1	2						1		2			8
CO2			1	3	1				1	1	1	2	1	11
CO3	1			2	2		2		1	2	2	2	2	16
CO4		2		3	1			2	1	2	2	2	2	17
CO5		3		2	1	2			1	2	2	2	2	17
Grand total of COs with PSOs and POs														69
Grand Total of Cos with PSOs and POs														1.72

Mean Value of CoS with PSOs and POs

$$= \frac{\text{Grand Total of Cos with PSOs and POs}}{\text{Number of CoS relating with PSOs and POs}} = (69/40)$$

Strong–3, Medium–2 & Low–1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of Cos with PSOs and POs		1.72	
Observation	**Cos of Dairy Technology related to a medium extent with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code &Title	Food Processing & Engineering, Technology of Fruits, Veg. and Dairy Technology Lab (22UFSP44)		
Class: II UG	Semester: IV	Hours-60	Credit-2
Course Objective	• To provide practical experience on fruits and vegetable processing and milk and milk products processing		

Content

Food Processing and Engineering Laboratory

1. Comparison of conventional and microwave processing of food.
2. Experimentation Osmotic Dehydration.
3. Drying of food using Hot air oven.

Technology of Fruits, Vegetables and Plantation Crops Laboratory

4. Estimation of TSS, pH value of fruit products
5. Estimation of brix:acidityratio of fruit products
6. Estimation of ascorbicacid and vitamin A using spectrophotometer.
7. Estimation of Pectin in fruits.
8. Preparation of Jam, Jelly, Marmalade.
9. Dehydration of fruits and vegetables.
10. Adulteration of spices– pepper, turmeric and chilly.
11. Visit to Fruits and Vegetable Processing Industry

Dairy Technology Laboratory

12. Analysis of milk–acidity, COB, MBRT, SNF, Specificgravity
13. Estimation of milk protein
14. Estimation of milk fat by Gerber method.
15. To prepare case in and calculation of yield.
16. Processing of Milk Pasteurization and Homogenization.
17. Detection of Milk Adulteration
18. Preparation of Paneer
19. Visit To Dairy Industry

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code &Title	Food Microbiology (22UFSA44)		
Class:II UG	Semester: IV	Hours: 45	Credit: 3
Cognitive Level	**K-1** Knowledge **K-2** Understanding **K-3** Application		
Course Objective	• The students will be able to differentiate various spoilages in food by microorganisms and gain knowledge on preservation methods, beneficial effect of microbes and their application.		

Unit	Content	Unit
I	History and Development of Food Microbiology -Definition and Scope of food microbiology, Inter-relationship of microbiology with other sciences. Types of microorganisms and Nomenclature.	I
II	Bacterial growth curve, Factors affecting the growth of microorganisms in food. Foodborne Diseases - Types – food borne infections, food borne intoxications - Origin, symptoms and prevention.	II
III	Microbial Food Spoilage. Sources of Microorganisms in foods. Spoilage of specific food groups- Cereal and cereal products, Milk and dairy products, Meat, poultry and sea foods, Fruits and vegetables and Canned products.	III
IV	Food Fermentation – definition and importance. Fermented vegetable and meat products – pickle, sauerkraut, tempeh, sausage and salami Fermented milk products-cultured buttermilk, Yogurt, Bulgarian sour milk, Butter, Cheese, types of cheese.	IV
V	Trends in Food Microbiology- Rapid Methods of Microbes Detection. Single Cell Protein (SCP), Single Cell Oil (SCO), Probiotics, Prebiotics & Synbiotics.	V
Textbooks	1. Ramesh, K. V. (2019). Food microbiology. MJP Publisher. 2. Adams, M. R., Moss, M. O., & McClure, P. (2016). Food Microbiology. UK: The Royal Society of Chemistry.	
Books for Reference	1. Pelczar, M. J., & Reid, R. D. (1958). Microbiology. Krishna Prakashan Media. 2. Jay, J. M., Loessner, M. J., & Golden, D. A. (2008). Modern food microbiology. Springer Science & Business Media.	

Course Outcome

After completion of the course, students should be able to do

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Understand the basics of food microbiology	K2
CO2	Have knowledge about microorganisms present in food	K1
CO3	Understand the role of microbes in food spoilage.	K2
CO4	Correlate microbes with food borne diseases.	K3
CO5	Know the recent trends in food microbiology.	K1

K1=Remembering, K2=Understanding, K3=Application, K4=Analysis 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	2	1							1	1				5
CO2		3	2						2	1	1			9
CO3	1	2	2						1	1	2		1	10
CO4	1		1	1			2				1		1	7
CO5					1			2		2		3	1	9
Grand total of COs with PSOs and POs														40
Grand Total of Cos with PSOs and POs														1.4

$$\text{Mean Value of Cos with PSOs and POs} = \frac{\text{Mean Value of Cos with PSOs and POs}}{\text{Number of Cos relating with PSOs and POs}}$$

Strong- 3, Medium- 2 & Low–1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of CoS with PSOs and POs		1.4	
Observation	**CoS of Food Microbiology related to a medium extent with PSOs and POS**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Class	:B.Sc., Food Science and Technology	Part III:AlliedLab-4	
Semester	:IV	Hours :30	
Subject Code	:22UFSQ44	Credit :1	

Food Microbiology Laboratory

Course Objective	• Students will be exposed to hands-on experience on handling equipments, media, and procedure to find various microbes.
Content	

A. Handling of Instruments and Equipments
  1. Microscope
  2. Autoclave
  3. Laminar Air Flow
  4. Incubator
  5. Hot Air Oven
  6. Micropipettes
  7. Petriplates
  8. Inoculationloop
  9. L-Rod
  10. Preparation of cotton plug
B. Preparation of culture medium
C. Isolation and Plating
  11. Gram staining method
  12. Streak plate method
  13. Pour plate method
D. Microbial analysis of water
  14. MPN method
  15. Presumptive test
  16. Hanging drop method	

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code &Title	Non-Major Elective: Basics of Nutrition (22UFSN24)		
Class - II B.Sc., Phy, Chem, Mat, CS, RDS	Semester:IV	Hours-45	Credits-2
Course Objective	• The course aims at students getting to know basic nutrients and its functions, menu planning, different methods of cooking, education and recent concepts in nutrition		

UNIT	Content	No. of Hours
I	**Introduction to Nutrition science**: Definition of the term- Food, Nutrients, Health, Nutrition, Malnutrition, Under Nutrition, Over Nutrition, Balance diet. Food as a source of macro (Carbohydrate, fat & protein) and micronutrients (Vitamins & Minerals).	9
II	Nutrients - Types- Macronutrients (Carbohydrates, Proteins and Fat) and Micronutrients (Vitamins A, D, E, K, C and B Vitamins, Minerals-Ca and I) - Functions, Sources and Deficiency	9
III	Functions of food, Basic five food group - Food guide pyramid- My plate.	9
IV	Types of diet – clear fluid, full fluid and soft diets. Therapeutic diet – Tuberculosis, Influenza, Ulcer. Diet for weight loss and weight gain.	9
V	Health education – Principle, Steps in planning health and nutrition education, Assessment of nutritional status, Mobile and digital health intervention. Recent concepts- Definition - Food fortification, biofortification and Functional foods	9
Text books	1. Srilakshmi, B. (2018). Evaluation of food quality, Textbook of nutrition Science. New Age International, 5, 328-329. 2. Shubhangi. J. (2002). Nutrition and Dietetics. 2 nd edition, Tata McGraw – Hill publishing company Limited, New Delhi.	
Books for Reference	1. Sunetra Roday, Food Science & Nutrition. Oxford University process ISBN 13- 978-0199489089	

Course Outcome

S.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Acquire knowledge about the basics of Nutrition	K2
CO2	Able to classify the nutrients and identify specific deficiency disorders	K2
CO3	Aware about the terms and techniques in the field of food nutrition	K2
CO4	Able to formulate various types of diet for communicable and non-communicable diseases	K2
CO5	Acquire Knowledge on health intervention, education and recent concepts related to food nutrition	K3

K1=Remembering, K2=Understanding, K3=Application, K4=Analysis 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		1						1		2	1		8
CO2	2	1	2		1				1	1	2	1		11
CO3	3	1	1				2		1		1	2		11
CO4	3	2	2	1						1	2	3	1	15
CO5	2	1	2		1			2	2		3	2		15
Grand total of COs with PSOs and POs														60
Grand Total of CoS with PSOs and POs														**1.66**
Mean Value of CoS with PSO and POs =---= (60/36) **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		1.66	
Observation	**CoS of Basics of Food Science related to a medium extent with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Course Code & Title	FOOD PRESERVATION (22UFSSL4)
Class	III-FST
Cognitive Level	**K-1** Knowledge **K-2** Understanding **K-3** Application
Course Objective	To study about basics of food preservation, different preservation methods and to get awareness regarding usage of preservatives.

UNIT	Content
I	**Introduction to food preservation**- Objective and techniques of food preservation- Definition of food spoilage and food preservation- Importance of Food preservation.
II	**Preservation by low temperature**- Refrigeration, freezing and freeze-drying, Introduction to thawing, changes during thawing and its effect on food.
III	**Preservation by high temperature**- Drying, Dehydration, Canning, Pasteurization, Sterilization, Blanching.
IV	**Preservation by preservatives**- Objective, Principles, Types of preservatives- Class I and Class II Preservatives, advantages and limitations Preservation by osmosis – sugar, salt, curing and pickling.
V	**Trends In Food Preservation** – Hurdle Technology, Active Packaging, High Pressure Processing, Ohmic Heating, Pulsed Electric Field, Role of Microorganisms in Food Preservation. Food irradiation –Definition, types, advantages and limitations
Books for Reference	1. Srilakshmi, B. (2018). Food Science. New Age International. 2. Meyer. (2004). Food Chemistry, New Age publishers. 3. Frazier WC and Westh off DC. (1988). Food Microbiology, TMH Publication, New Delhi. 4. Potter, N. N., & Hotchkiss, J. H. (2012). Food science. Springer Science & Business Media.
Course Outcomes	On completion of the course, students should be able to **CO1:**Understand the Objective and techniques of food preservation. **CO2:**Know about techniques involved in low temperature preservation. **CO3:**Learn about high temperature preservation. **CO4:**Getting depth knowledge on usage preservatives. **CO5:**Know the trends used in high osmotic pressure.

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	1		2	3	2		2	1	3	2		22
CO2	3	3		2	2	3	3	2	3		3	3	1	29
CO3	3	3			3	3	3		3	2	3	3		26
CO4	3	3		2	1	3	2	2	3	2	3	3	2	27
CO5	3	3		1	1	3	3	2	1	1	3			23
Grand total of Cos with PSOs and POs														132
Grand Total of Cos with PSOs and POs **Mean Value of Cos with PSOs and PO** =--(132⁄52) **Number of Cos relating with PSOs and POs**														2.53

Strong –3, Medium–2 & Low–1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of Cos with PSOs and POs			2.53

Department of Food Science and Technology

Carrier Oriented Course on Lifecycle Nutrition

Semester: III

OBJECTIVES:

To enable the students to

- Learn the principles of meal planning, diet therapy; provide appropriate nutritional care, prevention and treatment of various diseases.

UNIT I

Definition – Lifecycle Nutrition, Recommended Dietary Allowance, Basal Metabolic Rate

Stages of Lifecycle, Process of Aging and Factors influencing the process of Aging.

Meal Planning – Definition, Principles; Steps involved in planning diet.

UNIT II

Expectant mothers – Physiological changes Pre conceptual Nutrition, Nutritional requirements, Complications.

Lactacting Women – Role of Hormones in Milk Production, Nutritional requirements.

UNIT III

Old Age – Process of ageing, Nutritional Requirements, Food Requirements, and Nutritional related Problems in old age

Nutrition and food requirements for Adults

UNIT IV

Adolescents - Nutritional Requirements, Food Requirements, Nutritional Problems

Nutrition and food requirements for School children

Nutritional Requirements, Food Requirements, Packed Lunches, School lunch Programme.

UNIT V

Infants - Growth and Development during Infancy, Nutritional Requirements, Food Requirements, Low Birth Weight, Pre-term Baby, Weaning.

Pre-school Children - Nutritional Requirements, Food Requirements, Nutritional related problems of Pre – Schoolers, Feeding Programmes.

Book for Study:

Srilakshmi. B, (2018), Dietetics, New Age International (P) Ltd, Publishers, Chennai, 5th Edition.

Robinson, C.H (1977), Normal and the Therapeutic Nutrition, The Oxford and IBH Publishing Co.

Gopalan. C., and Balasubramanian, S.C. Ramasastri, B.V. and Viswesvera Rao (1970), Diet Atlas of India, ICMR, New Delhi.

Book for Reference:

Shubangini A Joshi, (1998), Nutrition and Dietetics, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi.

National Institute of Nutrition, (2005): Dietary Guidelines for Indians – A Manual, Hyderabad.

Course outcomes

After completion of the course, students should be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO$_1$	Understand the basic terms and concepts in Lifecycle Nutrition	K2
CO$_2$	Acquire knowledge about the nutritional status and nutrient needs of Expectant and Lactating Mothers	K3
CO$_3$	Gain knowledge about the nutritional status and nutrient needs of Adult and Old age	K4
CO$_4$	Able to comprehend the nutritional needs and nutritional status of Adolescent and School children	K2
CO$_5$	Know about the nutritional status and nutritional needs of Infants and Pre-school children	K3

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K$_5$= Synthesis

SEMESTER : III

OBJECTIVES:

- Planning of normal diet, therapeutic diet for different disease conditions.

1. Planning, Preparation and calculation of diet for man and women

    a. Normal

    b. Moderate

    c. Sedentary

2. Planning, Preparation and calculation of diet for pregnant women'

3. Planning, Preparation and calculation of diet for lactating mother

4. Planning, Preparation and calculation of diet for infant

5. Planning, Preparation and calculation of diet for school going children.

6. Planning, Preparation and calculation of diet for adolescents.

7. Planning, Preparation and calculation of diet for old age.

Department of Food Science and Technology

Carrier Oriented Course on Dietetics

Semester: IV

OBJECTIVES:

To enable the students to:

1. Understand the role of nutrition for good health and obtain knowledge on different therapeutic diets and their preparation.

Unit I

Dietetics - Definition

Dietitian - Definition, Classification, Code of Ethics and Responsibility

Introduction to Therapeutic Diets:

Definitions of Normal diet, Therapeutic diet, Objectives of Diet Therapy.

Special feeding methods, Tube feeding- types, advantages and disadvantages, Parenteral feeding.

Unit II

Causes, symptoms and dietary management of:

Obesity – Aetiology, Theories, Assessment, types, Treatment

Underweight - Aetiology, Theories, Assessment, types, Treatment

Febrile diseases -Typhoid, Influenza, Malaria, Tuberculosis, Covid

Unit III

Nutritional Anaemia - Prevalance, Causes, types – Iron Deficiency Anaemia, Megaloblastic Anaemia, Differentiating Anaemia, Prevention.

Diabetes mellitus – Types, Aetiology, symptoms, Diagnois, Treatment. Gestational Diabetes mellitus.

Unit IV

Cardio vascular Disease - Prevalance, Clinical effects, Risk Factors, Dietary Management, Hyper tension, Hyper cholesterolemia.

Routine Hospital diets – clear fluid diet, full fluid diet, soft diet, regular normal diet, pre-operative diet, Post-operative diet.

Unit V

Gastro Intestinal Diseases - Peptic Ulcer, Constipation, Diarrhoea, Lactose intolerance, coeliac Disease, irritable bowel syndrome, Intestinal gas and flatulence, Diverticular disease.

Kidney Diseases - Glomerulonephritis, Nephrotic Syndrome, Acute Renal Failure, Chronic Renal Failure.

Book for Study:

1. Davidson S, Passmore R, Breck JFT (1975), Human Nutrition and Dietetics, The English Language, Book Society and Churchill Livingston, 2nd edition.
2. Kathleen ML and Escott S (2002), Krause's Food, Nutrition and Diet Therapy, Saunders Company Pennsylvania, 9th edition.
3. Thomas B. Manual of Dietetic Practice (1988), Blackwell Scientific Publications, Oxford, London.
4. Robinson CH (1972), Normal and Therapeutic Nutrition, Oxford Publishing Co, Bombay.

Book for Reference:

1. Erdman JW, Macdonald IA and Zeisel SH (2012),Present Knowledge in Nutrition, Applicable from 1st June, International Life Sciences Institute Press, Washington DC, 10th edition.
2. Shills ME, Olson JA, Moshe S and Ross CA (2006), Modern Nutrition in Health and Disease, Lippincott Williams and Wilkins Publications.
3. Gibney MJ, Macdonald IA and Roche HM (2003), Nutrition and Metabolism, BlackwellPublishing, UK.
4. Gibney MJ,Elia M, Ljungqvist O and Dowsett J (2005), Clinical Nutrition, Blackwell Publishing,UK.
5. Park K (2011), Text Book of Preventive and Social Medicine, BanarsidasBhanotPublishers, Jabalpur, India, 2nd edition.

Course outcomes

After completion of the course, students should be able to

SL.NO	COURSE OUTCOME	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO$_1$	Understand the relationship between healthy eating and prevention of illness and disease.	K2
CO$_2$	Gain knowledge about diet therapy in the treatment of illnessand disease.	K3
CO$_3$	Gain knowledge about the management of non-communicable diseases by therapeutic diet	K4
CO$_4$	Understand the management of cardiovascular disorders by therapeutic diet	K2
CO$_5$	Acquire knowledge in primary care managing dietary needs in Gastro intestinal and renal disorders	K3

K1= Remembering, K2= Understanding, K3 = Application, K4= Analysis and K$_5$= Synthesis

COC PRACTICAL ON DIET THERAPY

SEMESTER :IV

OBJECTIVES:

- Planning of normal diet, therapeutic diet for different disease conditions.

1. Planning, Preparation and display of Therapeutic diet

   a. Soft diet

   b. Clear diet

   c. Full liquid diet.

2. Planning, Preparation and display of diet for fever

   a. Typhoid

   b. Tuberculosis

   c. Malaria

3. Planning, Preparation and display of diet for

   a. Obesity

   b. Under weight.

4. Planning, Preparation and display of diet for

   a. Diabetes

   b. Peptic ulcer

5. Planning, Preparation and display of diet for cardio vascular disease.

   a. Atherosclerosis

   b. Hypertension

6. Planning, Preparation and display of diet for gastro intestinal disorder

   a. Ulcer

   b. Diarrhoea

   c. Constipation

7. Planning, Preparation and display of diet for Kidney disease.

   a. Nephritis

   b. Renal calculi.

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
		I Semester		
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	5
	22UTLC21	Core: 2 இலக்கணம் - நன்னூல் - எழுத்து	06	5
	22UTLA11	Allied – 1. கணினித் 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	-	-
			30	**24**
		II Semester		
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
			30	**24**
		III Semester		
I	22UTAL33/ 22UHNL33/ 22UFNL33	Tamil /Hindi /French	06	4
II	22UENA33 22UENB33	English through Literature – I – Stream – A English through Literature – I – Stream – B	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	-	-
			30	**22**
		IV Semester		
I	22UTAL44/ 22UHNL44/ 22UFNL44	Tamil /Hindi /French	06	4
II	22UENA44 22UENB44	English through Literature – II – Stream – A English through Literature – II – Stream – B	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
			30	**25**
		V Semester		
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
			30	**24**
		VI Semester		
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
			30	**25**

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

இளங்கலைத் தமிழ்

பருவம் : மூன்றாம் பருவம்   பகுதி : III- Core - 5

பாடம் : பக்தி இலக்கியம்   நேரம் : 75 மணிகள்

குறியீடு : 22UTLC53   மதிப்புப் புள்ளிகள் : 4

நோக்கங்கள்

· தமிழின் பக்தி இலக்கியப்பரப்பு குறித்த அறிமுகம் பெறுதல்.

· பல்சமய இலக்கியங்களின் வாயிலாக தமிழ் இறைநெறி இயங்கியலை உணர்தல்.

· பல்சமய இலக்கியங்கள் முன்வைக்கும் அறங்களின் தன்மைகளை மதிப்பிடுதல்.

· பக்தி இலக்கியச்சுவை நுகர்தல். பக்திச் சிறப்புகள் குறித்த புரிதல் பெறுதல்.

· பக்திமை முன்வைப்புகளை மதிப்பிட்டு சமூகக்கூறுகளைப் பகுத்தாய்தல்.

அலகு - 1   (15 மணிகள்)

• சைவசமய இலக்கியவரலாறு

• திருஞானசம்பந்தர் - தேவாரம் - முதலாம் திருமுறை
திருபிரமபுரப் பதிகம் - 10 பாடல்கள் (தோடுடையசெவியன்...)

• திருநாவுக்கரசர் - தேவாரம் - நான்காம் திருமுறை
திருவதிகைவீரட்டானப் பதிகம் - 10 பாடல்கள் (கூற்றாயினவாறுவிலக்கல்லீர்...)

• மாணிக்கவாசகர் - திருவாசகம் - குலாப்பத்து - 10 பாடல்கள் (ஓடும் கவுந்தியமே...)

அலகு - 2   (15 மணிகள்)

• வைணவ இலக்கியவரலாறு

• பெரியாழ்வார்திருப்பல்லாண்டு
12 பாடல்கள் (பல்லாண்டுபல்லாண்டுபல்லாயிரத்தாண்டு...)

• ஆண்டாள் - திருப்பாவை
பாசுரங்கள் 474 முதல் 503 வரை - (மார்கழித் திங்கள் மதிநிறைந்தநன்னாளால்...)

• நம்மாழ்வார் - திருவாய்மொழி
2791 முதல் 2802 வரை - (உயர்வறஉயர்நலம் உடையவன்...)

அலகு - 3   (15 மணிகள்)

• சமயசன்மார்க்கஇலக்கியவரலாறு

• தாயுமானவர் - எங்கும் நிறைபொருள்
1-10 பாடல்கள் - (அவனின்றிஒருஅணுவும் அசையாதெனும்...)

• வள்ளலார் - திருவருட்பா - ஆறாம் திருமுறை - பற்றறுத்தல்
சத்தியம் தொடங்கிதெய்வம் பலபலசிந்தைசெய்வாரும் எனமுடியும் 11 பாடல்கள்

• அருணகிரிநாதர் - திருப்புகழ் 6 (திருவருணை) - (முத்தைத்தருபத்தித் திருநகை...)

அலகு - 4   (15 மணிகள்)

• சித்தர் இலக்கியவரலாறு

• பட்டினத்தார் - முதலாவதுகோயிற்றிருவகவல் "பிறந்தன இறக்கும் இறந்தனபிறக்கும்"
எனத்தொடங்கி"நினைமின் மனனே" எனமுடியும் - 08 பாடல்கள்

• கடுவெளிச்சித்தர் - ஆனந்தக்களிப்பு - "பாபஞ் செய்யாதிருமனமே"
எனத்தொடங்கி"செய்திடில் சேர்ந்திடும் தொண்டு" எனமுடியும் - 20 பாடல்கள்

• அகப்பேய் சித்தர் - "சமயமாறுமடிஅகப்பேய்..." எனத்தொடங்கி"அகப்பேய்
போகாதேஉன்னைவிட்டு." எனமுடியும் (21-30) - 10 பாடல்கள்

- பிறசமய இலக்கியவரலாறு (சமணம்,பவுத்தம்,கிறித்தவம், இசுலாம்)
- வீரமாமுனிவர் -தேம்பாவணி - மகவருள் படலம் - திருமகன் பிறப்பு
  *"பொதிர்தரும் களிபொழிந்து"*எனத் தொடங்கும் 05 பாடல்கள் (92 முதல் 97 வரை)
- சதாவதானிசெய்குத்தம்பிபாவலர் - நபிகள் நாயகமான்மியமஞ்சரி - *"வையமெலாம் வாழ்த்தெடுப்பவந்தநபி"*எனத்தொடங்கும் காப்புச் செய்யுள் முதலானமுதல் 10 பாடல்கள்
- பவுத்தம் - மணிமேகலை -அரவணர் தொழுதகாதை
  *"இருள்பரந்துகிடந்தமலர்த்தலைஉலகத்து"*எனத்தொடங்கும் 75ஆம் அடிமுதல் *"மாதர் நின்னால் வருவன இவ்வூர்"*எனமுடியும் 100வது அடிவரையிலானபாடல்கள்.
- குண்டலகேசி- அறநிலைப் படலம் - *"விருந்தினால் பொலிந்த இல்லம்"*எனத் தொடங்கும் 1115ஆம் அடிமுதல் *"தத்துவமுதன்மைப் பாவாய் தாங்குக இவற்றையென்று"*எனமுடியும் 1120 அடிவரையிலானபாடல்கள்.

பாடநூல்கள்
- ❖ முனைவர் பாக்கியமேரி,தமிழ் இலக்கியவரலாறு,பூவேந்தன் பதிப்பகம்,சென்னை, 2022
- ❖ பன்னிருதிருமுறைகள் - கழகவெளியீடு, 1989.
- ❖ நாலாயிரதிவ்வியபிரபந்தம்,கழகவெளியீடு,சென்னை
- ❖ சித்தர் பாடல்கள்,மணிவாசகர் பதிப்பகம்
- ❖ தேம்பாவணி
- ❖ நபிகள் நாயகமான்மியமஞ்சரி
- ❖ மணிமேகலைமணிவாசகர் பதிப்பகம்
- ❖ குண்டலகேசிமணிவாசகர் பதிப்பகம்

கற்றல் கற்பித்தல் வழிமுறைகள்
1. சமய இலக்கியப் பரப்பினை நூலக வழிஅறிமுகம் செய்தல்.
2. பல் சமயங்களின் சிறப்புகளைவிளக்கியுரைத்தல்.
3. ஆன்மிகக் கருத்துக்களின் தன்மைகள் குறித்துகலந்துரையாடல்.
4. காணொலிக் காட்சி மூலம் விளக்குதல்.
5. சமயப் பின்பற்றுவழக்குகள் குறித்துஉரையாடுதல்.

கற்றல் கற்பித்தலின் விளைவுகள்

வ.எண்	கற்பித்தல் கற்றல் விளைவுகள்	புளும்சு மதிப்பீடு
1	பல் சமய இலக்கியங்களை அறிதல்	K1, K2
2	சமய இலக்கியங்களைத் தற்காலச் சூழலோடு பொருத்திக்காட்டிப் பகுத்தாய்தல்	K1, K2, K3, K4,
3	சமய அடியவர்களின் பக்திச் சிறப்புகளை இலக்கிய வழி அறிதல்	K2, K3
4	பக்தி இலக்கியங்களின் வழியாகச் சமயநல்லிணக்கச் சிந்தனைகளைஒப்பிட்டுணர்தல்.	K1, K2, K3,K4, K5
5	சமய இலக்கியங்களின் வழியாகவாழ்வியலைப் புரிந்துணர்தல்.	K2, K3, K5

- 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, PSOs &Pos
CO1	3	3	2	3	1	3	1	3	2	2	1	2	1	27
CO2	3	2	3	2	1	3	1	3	3	2	1	1	1	26
CO3	3	2	3	2	1	3	1	2	2	2	1	1	1	24
CO4	3	3	2	3	1	3	1	3	3	2	1	2	1	28
CO5	3	2	2	2	1	3	1	3	3	2	2	2	1	27
														132
Mean Value of Cos with PSO and Pos														2.03

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			2.03
Observation	COs of Strongly related with PSOs and Pos		

அருள் ஆனந்தர்கல்லூரி (தன்னாட்சி),கருமாத்தூர் - 625 514
இளங்கலைத் தமிழ் இலக்கியம்

வகுப்பு : இளங்கலைத்தமிழ்   பாடம் : இலக்கணம் - யாப்பு, அணி
பருவம் : மூன்றாம் பருவம்   நேரம் : 90 மணிகள்
குறியீடு : 22UTLA33   மதிப்பெண் : 100
மதிப்புப்புள்ளி : 4

நோக்கங்கள்

- யாப்பிலக்கணம்,அணியிலக்கணம் வரலாற்றினைஅறிமுகம் செய்தல்.
- செய்யுளின் உறுப்புக்களைஅறிந்துயாப்பிலக்கணப் பயிற்சிபெறுதல்
- பாவின் வகைகளையும் இனங்களையும் அணியின் வகைகளைக் கண்டறிந்துவகைப்படுத்துதல்.
- பழந்தமிழ் நூல்களில் காணலாகும் யாப்பு,அணிவகைகளைப் பகுத்துவிளக்கியுரைத்தல்.
- கவிதையில்யாப்பு,அணிநலன்களைப் பயன்படுத்தபயிற்சிஅளித்தல்

அலகு - 1   (18 மணிநேரம்)
யாப்பிலக்கணம்,அணியிலக்கணம்வரலாறு
யாப்பருங்கலக்காரிகை -உறுப்பியல்
உறுப்பியல்:எழுத்து - அசை - சீர் - தளை - அடி - தொடை.

அலகு - 2   (18 மணிநேரம்)
யாப்பருங்கலக்காரிகை - செய்யுளியல்:பாவுக்குரியஅடியும் ஓசையும் - வெண்பாவும் அதன் இனமும் - ஆசிரியப்பாவும் அதன் இனமும் - கலிப்பாவும் அதன் இனமும் - வஞ்சிப்பாவினமும் வஞ்சிப்பாவிற் கீறாமாறும் - மருட்பா.

அலகு - 3   (18 மணிநேரம்)
தண்டியலங்காரம் - பொதுவணியியல்
செய்யுள் வகை- முத்தகச் செய்யுள்,குளகச் செய்யுள்,தொகைநிலைச் செய்யுள்,தொடர்நிலைச் செய்யுள்.செய்யுள் நெறி - 1.வைதருப்ப நெறி 2.கௌட நெறி.

அலகு - 4   (18 மணிநேரம்)
தண்டியலங்காரம் -பொருளணியியல்
தன்மையணி - உவமையணி - உருவகவணி - தீவகவணி - பின்வருநிலையணி - முன்னவிலக்கணி - வேற்றுமைப்பொருள் வைப்பணி - வேற்றுமையணி - விபாவனையணி - ஒட்டணி - அதிசவணி - தற்குறிப்பேற்றவணி - ஏதுவணி - நுட்பணி - இலேசவணி - நிரனிறையணி - ஆர்வமொழியணி - சுவையணி - தன்மேம்பாட்டுரையணி - பரியாயவணி - சமாகிதவணி - உதாத்தவணி - அவநுதியணி - சிலேடையணி -ஒப்புமைக்கூட்டவணி - விரோதவணி - மாறுபடுபுகழ்நிலையணி - புகழாப் புகழ்ச்சியணி - நிதரிசனவணி - புணர்நிலையணி - பரிவருத்தனையணி - வாழ்த்தணி - சங்கீரணவணி - பாவிகவணி.

அலகு - 5   தண்டியலங்காரம் - சொல்லணியியல்   (18 மணிநேரம்)
மடக்கு - சொல் மடக்கு,அடிமடக்கு,எழுத்துமடக்கு,சித்திர கவி,வழுக்கள்,மலைவுகள்.

கற்பித்தல்,கற்றல்முறைகள்

- கரும்பலகைப் பயன்பாடு
- காணொலிக் காட்சிவழிக் கற்பித்தல்
- எடுத்துக்காட்டுதந்துவிளக்குதல்
- கலந்துரையாடல்
- வினாடிவினாமுறை

பாடநூல்கள்

- சுபாஷ்சந்திரபோஸ் ச. (உரை),யாப்பருங்கலக் காரிகை,இயல் வெளியீடு,தொப்புள் பிள்ளையார்கோவில் தெரு,தெற்கலங்கம்,தஞ்சாவூர், 2017 (இ.ப)

- சுபாஷ் சந்திரபோஸ் ச. (உரை.),தண்டியலங்காரம், இயல் வெளியீடு,தொப்புள் பிள்ளையார்கோவில் தெரு,தெற்கலங்கம்,தஞ்சாவூர், 2018 (நா.ப.)

பார்வை நூல்கள்

- வேங்கடசாமிநாட்டார்ந.மு. (உரை.),யாப்பருங்கலக் காரிகை,கழகவெளியீடு,சென்னை, 2004 (28ஆம் ப.)
- சுன்னாகம் குமாரசாமிப்புலவர் (உரை.),அமிதசாகரர் இயற்றியயாப்பருங்கலக்காரிகை, இந்துசமயகலாசாரஅலுவல்கள் திணைக்களம், இல.98,வோட் பிளேஸ்,கொழும்பு, 1938 (மூ.ப.)
- மணிகண்டன் ய. (பதி.),அமிதசாகரனார் இயற்றியயாப்பருங்கலம்,சரசுவதிமகால் நூலகம்,தஞ்சாவூர், 2005
- குமாரசாமிப் புலவர் அ. (உரை.) தண்டியலங்காரம் மூலமும் உரையும்,சுன்னாகம் கு. அம்பலவாணபிள்ளைபதிப்பு, 1926.

வ.எண்	கற்றலின் விளைவு	மதிப்பீட்டுநிலை
1.	யாப்பிலக்கணம்,அணியிலக்கணம் கற்கும் முறைகளைஅறிந்துகொள்ளுதல்.	**K1**
2.	செய்யுளின் யாப்புக் கட்டமைப்பு,அணிப் பயன்பாடுகுறித்ததெளிவுபெறுதல்.	**K1, K2**
3.	அசைபிரிப்புமுறைகளைப் புரிந்துபயன்படுத்துதல்	**K3, K4**
4.	செய்பியுளில் காணலாகும் அணிவகைகளைக் கண்டறிந்துபயன்படுத்தக் கற்றல்	**K1, K4**
5.	யாப்புமரபைப் புரிந்துகொண்டு,மரபுக்கவிதைஎழுதும் ஆற்றல் பெறுதல்	**K3, K5**

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	2	1	3	1	1	2	3	2	3	2	27
CO2	3	1	3	3	1	3	3	2	2	3	1	2	1	28
CO3	3	1	3	3	1	2	1	1	1	3	3	2	1	25
CO4	3	1	3	3	1	2	1	1	1	2	3	2	1	24
CO5	3	1	3	3	1	3	1	1	2	3	2	3	1	27
											Grand Total of COs with PSOs and Pos			131
											Mean Value of Cos with PSO and Pos			2.01

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			2.01
Observation	COs of Strongly related with PSOs and Pos		

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி),கருமாத்தூர் - 625 514.
இளங்கலைத் தமிழ் - மூன்றாம் பருவம்
மக்கள் தகவல் தொடர்பியல்

வகுப்பு: இளங்கலைத் தமிழ்
பகுதி : III (Core Elective-1)

பருவம்: மூன்றாம் பருவம்
நேரம் : 60மணிகள்

குறியீடு : 22UTLE13
மதிப்புப்புள்ளி: 3

நோக்கங்கள்

❖ மக்கள் தகவல் தொடர்புஊடகம் குறித்துஅறிமுகம் செய்தல்.

❖ அச்சுவழித்தொடர்பு,மின்வழித் தொடர்புஊடகங்களின் வரலாற்றையும் தகவல் சனநாயகத்தையும் கற்பித்தல்.

❖ மின்னணுஊடகங்களையும் அவைகள் தகவல் கொடுப்பதில் ஏற்படுத்தும் மாற்றங்களையும் பகுத்தாய்தல்.

❖ ஊடகங்களில் வெளிப்படும் மொழிப் பயன்பாட்டைஎடுத்துரைத்தல்.

அலகு -1 **மக்கள்தகவல் தொடர்பும் ஊடகமும்**

மக்கள் தகவல் தொடர்பியல் விளக்கம் - தனிமனிததகவல் தொடர்பின் வகைகள் - தகவல் தொடர்புசெய்முறைகள் - தொடர்பியல் கூறுகள் - செய்தித் தடைகள் - மீள் தொடர்பு - மீள் தொடர்பின் வகைகள் - தகவல் தொடர்பின் பாதிப்புகள் - தகவல் தொடர்பின் ஊடகங்களின் பங்கு - ஊடகங்களின் வகைகள் - ஊடகங்களின் இன்றியமையாமை

அலகு -2 **அச்சு வழிஊடகங்கள்**

இதழியல் சொல் விளக்கம் - அச்சுவழிஊடகங்களின் (இதழியல்) தோற்றமும் வளர்ச்சியும் - இந்திய இதழ்கள் வரலாறு— 19ஆம் நூற்றாண்டு இதழ்கள் - தமிழ் இதழ்கள் வரலாறு - இதழ்களின் தனிச்சிறப்புகள் - இதழ்கள் வகைகள் - இதழ்களின் பகுப்புகள் - பொறுப்பு—கொள்கைகள் - பணிகள் - அமைப்புமுறை— செய்தியின் வகைகள் - உள்ளடக்கங்கள் - செய்திகளைப்பெறும் வழிமுறைகள் - செய்திஎழுதும் முறை - செய்திகளைஎழுதும் பொழுதுகடைப்பிடிக்கவேண்டியவேண்டியவைகள் - புகைப்படங்கள் - படங்களின் வகைகள் - கருத்துப்படங்கள் - படத்துணுக்குகள் - கேலிச்சித்தரங்கள் - விளம்பரங்கள் - நூல் மதிப்புரை—துணுக்குகள் - ஆசிரியருக்குக் கடிதங்கள் மொழிநடை - செய்தியாளர் அல்லது இதழியலாளர் - செய்தியாளரின் பண்புகள் - தகுதிகள் - கடமை - பொறுப்பு

அலகு -3 **மின்வழிஊடகங்கள்**

வானொலி - வானொலியின் வரலாறு - ஒலிபரப்புநிலையங்கள் - பல்வேறுவகையானவானொலிநிகழ்ச்சிகள் (செய்திஒலிபரப்பு - முறைசாராக் கல்வி - வேளாண்மைசார்ந்தநிகழ்வுகள் - இசைநிகழ்ச்சிகள் -இலக்கியஒலிப்பரப்புகள் - கவியரங்கம் - நாடகம் - நினைவுச் சொற்பொழிவுகள் - வானொலியில் நேர்காணல்) - தொலைக்காட்சி - தொலைக்காட்சியின் தோற்றமும் வளர்ச்சியும் - இந்தியாவில் தொலைக்காட்சிவரலாறு - தொலைக்காட்சியின் நிகழ்ச்சிகள் (தொலைக்காட்சிசெய்திகள் - கல்விநிகழ்ச்சிகள் - பேட்டிகள் (நேர்காணல்) - தொலைக்காட்சியின் செல்வாக்கு)

அலகு-4 **மின்னணுஊடகங்கள்**

கணிப்பொறி - கணினியின் வரலாறு - கணினியின் வகைகள் - கணினியின் செயல்பாடு - கணினியின் பயன்பாடு - கணினிஅச்சு - கணினிவைரஸ் - குறுவட்டு - சி.டி.ராம் - ∴பிளாப்பிதட்டு - கடினத்தட்டு - விண்டோஸ் - இணையம் - இணையத்தின் தோற்றுமும் வளர்ச்சியும் - தமிழில் இணையம் - இணையத்தின் கட்டுப்பாட்டகம் - இணைய இணைப்பினைவழங்கும் நிறுவனங்கள் - இணையமுகவரி—வலைபின்னலின் வகைகள் - இணைய இதழ்கள் - வலைப்பூ- மின்னணுஅஞ்சல் - கூகுள் - முகநூல் - ஆர்க்குட் - டுவிட்டர் - புலனம்

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அலகு-5 **ஊடகத்துறையில் மொழியின் பயன்பாடு**

அச்சுவழிஊடகங்களின் மொழியின் பயன்பாடுஅச்சுப்படிதிருத்துதல் - அச்சுப்பிழைதிருத்துவோரின் பொறுப்புகள் - அச்சுப்பிழைத் திருத்தும் முறைகள் - அச்சுப்படியைத் திருத்துபவர் பின்பற்றவேண்டியநெறிமுறைகள் - அச்சுப்பிழைதிருத்தக் குறியீடுகள் - மின்வழிஊடகங்ளில் மொழியின் பயன்பாடு- மின்னணுஊடகங்களில் மொழியின் பயன்பாடு

கற்றல் கற்பித்தல் வழிமுறைகள்

❖ மக்கள் தொடர்புச் சாதனங்களைபற்றிஅறிமுகம் செய்தல்

❖ அச்சகம்,தொலைக்காட்சிநிலையம்,வனொலிநிலையம் போன்றவற்றிற்குமாணவர்களைஅழைத்துச்சென்றுபார்வையிடச்செய்தல்.

❖ மாணவர்களைச் கையெழுத்து இதழ் வெளியிடச்செய்தல்

❖ அச்சுப்பிழைதிருத்தம் செய்யவழிகாட்டல்; பயிற்சிஅளித்தல்.

❖ மாணவர்களின் படைப்பாற்றல் திறன்களைவெளிப்படுத்தும் வகையில்,எழுதும் வகையில் பயிற்சிகொடுத்தல்.

வ.எண்	கற்றல் விளைவுகள்	புளூம்சு மதிப்பீடு
1.	மக்கள் தகவல் தொடர்புச் சாதனங்கள் குறித்துஅறிமுகத்தைப் பெறுவர்	K1, K2
2.	பத்திரிகைகளுக்குகவிதை,கட்டுரை,துணுக்குஎழுதும் திறன் பெறுவர்.	K4, K5
3.	தகவல்களைச் சேகரித்து இதழ் வெளியிடும் உத்திகளையும் தொழில் நுட்பத்தையும் பெறுவர்.	K2, K3, K5
4.	தொலைக்காட்சி,பத்திரிகைகள் போன்றஊடகங்களில் செய்தியாளராகப் பணிசெய்யும் தகுதியும் திறமையும் பெறுவர்.	K3, K4, K5
5.	மொழியைப் பிழையில்லாமல் பேசவும் எழுதவும் திறன் பெறுவர்.	K3, K4, K5

K1 = தகவல் பெறுதல்,

K2 = புரிதல் பெறுதல்,

K3 = பயன்படுத்துதல்,

K4 = பகுத்தாய்தல்,

K5 = ஒருங்கிணைத்து மதிப்பிட செய்தல்

பார்வை நூல்கள்

1. டாக்டர் அ.சாந்தா,டாக்டர் வீ.மோகன்- மக்கள் ஊடகத் தொடர்பியல் அடிப்படைகள்,மக்கள் ஊடகத் தொடர்பியல் மீடியாப்பிளிக்கேஷன்ஸ்,மதுரை,2000.
2. டாக்டர் த. ரெஜித்குமார்,ஊடகவியல்,நியூ செஞ்சுரிபுக் ஹவுஸ்(பி) லிட்., 2017
3. டாக்டர் அ.சாந்தா,டாக்டர் வீ.மோகன்,புதியபரிமாணங்கள்,மீடியாப்பிளிக்கேஷன்ஸ்,மதுரை.
4. முனைவர் ச.ஈஸ்வரன்மற்றும்முனைவர் இரா.சபாபதி, இதழியல்,பாவைபதிப்பகம்,சென்னை,2009.
5. டாக்டர் மா.பா.குருசாமி, இதழியல் கலை, குரு-தேமொழி,திண்டுக்கல்,2006

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	2	1	2	3	2	3	1	2	2	1	1	25
CO2	1	1	2	2	2	1	2	2	2	2	2	2	2	23
CO3	2	2	1	2	2	2	2	2	2	3	2	2	2	26
CO4	1	2	1	2	2	2	2	2	2	1	2	1	2	22
CO5	2	1	2	1	1	2	2	2	2	3	3	2	3	26
Grand Total of COs with PSOs and Pos														122
Mean Value of Cos with PSO and Pos														1.87

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		1.87	
Observation	**COs of Strongly related with PSOs and Pos**		

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி),கருமாத்தூர் - 625 514.
இளங்கலைத் தமிழ் இலக்கியம் - மூன்றாம் பருவம்
கிறித்தவமும் தமிழும்

வகுப்பு : இளங்கலைத்தமிழ் இரண்டாமாண்டு   பகுதி : (Non Major Elective-1)
பருவம் : மூன்றாம் பருவம்   நேரம் : 45 மணிகள்
குறியீடு: 22UTLN13   மதிப்புப்புள்ளி: 2

நோக்கங்கள்
- கிறித்தவம் தமிழ் மொழிக்குச் செய்தபணிகளைஅறிதல்
- கிறித்தவத் தொண்டர்களின் தமிழ்ப் பணிகளைப் பகுத்தாய்தல்.
- கிறித்தவ இலக்கியங்களின் சிறப்புகளைஅறிதல்
- கிறித்தவசமயக் கருத்துக்களைத் தற்காலச்சூழலோடுபொருத்திப்பார்த்தலும் அதன் விளைவுகளைக் கற்றலும்
- கிறித்தவ இலக்கியம் வழியாகத் தற்காலத்திற்குஏற்றவையைப் பொருத்துதல்

அலகு 1.   ஐரோப்பியர் வருகை - காலம் - நோக்கம் - போர்த்துகீசியர் - டச்சுக்காரர் - பிரெஞ்சுக்காரர் - ஆங்கிலேயர் - தமிழ் பெற்ற நன்மைகள்.
கிறித்தவத் தொண்டர்களின் தமிழ்ப்பணி - அயல்நாட்டார் ,தமிழ்நாட்டார் தமிழ்த்தொண்டு

(9 மணிகள்)

அலகு 2.   காப்பியம்- வீரமாமுனிவர்- தேம்பாவணி (வளன் சனித்தபடலம்)

(9 மணிகள்)

அலகு 3.   நாடகம்-தந்தைசி.மணிவளன் சே.ச.- புதியபெத்தலகேம் குறவஞ்சி

(9 மணிகள்)

அலகு 4.   நாவல் - ஐசக் அருமைராஜன் - கீறல்கள்

(9 மணிகள்)

அலகு 5.   சிறுகதைகள் :மாற்கு - மறுபடியும்

(9 மணிகள்)

பாடநூல்கள்
1. வீரமாமுனிவர் - தேம்பாவணி (உரையாசிரியர் பேரா. மரியஅருட்பிரகாசம்) நொபிலிபுத்தகநிலையம்,கோ. புதூர்,மதுரை.
2. அருள் தந்தைமணிவளன் சே.ச., - புனித ஜெர்மேனம்மாள் சிறுமணிளென்னும் அம்மணிநாடகம்,கிறித்தவஆய்வுமையம்,திருச்சி.
3. மயிலைசீனிவேங்கடசாமி,கிறித்தவமும் தமிழும்,பாரிநிலையம்,சென்னை.

பார்வைநூல்கள்
1. வெ.கிருட்டிணசாமி,சமயமும் சிற்றிலக்கியமும்,தமிழ்த்துறைவெளியீடு,அருள்ஆனந்தர் கல்லூரி,கருமாத்தூர்.
2. மரியசெல்வம்,தேம்பாவணியில் காப்பியஉத்திகள்,முனைவர்ப்பட்டஆய்வேடு,மதுரைகாமராசர் பல்கலைக்கழகம்,மதுரை.

கற்றல் கற்பித்தல் வழிமுறைகள்
- கிறித்தவ நூல்களை அறிமுகம் செய்தல்
- கிறித்தவ சமயம் தொடர்பான செய்திகளை எளிய கதைகளுடன் எடுத்துக்கூறல்

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❖ கிறித்தவ தமிழிலக்கியங்கள் வழி அறக்கருத்துக்களை விளக்குதல்
❖ கலந்துரையாடல்.
❖ கட்டுரையாக்கப் பயிற்சியளித்தல்.

வ.எண்	கற்றல் விளைவுகள்	மதிப்பீட்டுநிலை
1	தமிழ் கிறித்தவ இலக்கியஅறிமுகத்தைபெறுதல்	K1, K2
2	கிறித்தவசமயக் கோட்பாடுகளைப் பற்றியஅறிமுகம் பெறுதல்	K1, K4, K2
3	தமிழ்மொழிவளர்ச்சிக்கானகிறித்தவர்களின் பங்களிப்பினைஅறிதல்	K2, K3, K5
4	தமிழ் கிறித்தவ இலக்கியஉள்ளடக்கங்களை ஆயந்தறிதல்.	K1, K2, K3, K5
5	தமிழ்ச் சூழலில் கிறித்தவம் ஆற்றியப் பணிகளின் விளைவுகளைக் புரிந்துகொள்ளுதல்	K2, K3, K5

K1 = தகவல் பெறுதல்,

K2 = புரிதல் பெறுதல்,

K3 = பயன்படுத்துதல்,

K4 = பகுத்தாய்தல்,

K5 = ஒருங்கிணைத்துமதிப்பீடுசெய்தல்

அருள் ஆனந்தர் கல்லூரி (தன்னாட்சி),கருமாத்தூர் - 625 514.
இளங்கலைத் தமிழ் இலக்கியம்
சிற்றிலக்கியம்

வகுப்பு : இளங்கலைத் தமிழ்   பாடம் : Core - 6
பருவம் : நான்காம் பருவம்   நேரம் : 75 மணிகள்
குறியீடு : 22UTLC64   மதிப்பெண் : 100
மதிப்புப்புள்ளி : 5

நோக்கங்கள் :

- சிற்றிலக்கியவகைகளைஅறிமுகம் செய்தல்
- சிற்றிலக்கியஉள்ளடக்கம்,அமைப்புகளைக் கற்றுணரச் செய்தல்
- சிற்றிலக்கியங்களைசமூக,சமயச் சூழல் வழியில் விளங்கவைத்தல்
- பல்வகைச் சிற்றிலக்கியங்களைப் பகுத்தாய்தல்
- சிற்றிலக்கியங்களில் மிளிரும் விழுமியங்களைமதிப்பீடு செய்தல்

அலகு–1 தஞ்சைவாணன் கோவை(வரைவியல் முழுவதும்)   15 மணிகள்
1. சிற்றிலக்கியவகைமைகள் - அமைப்பு - வரலாறு
2. வரைவியல்
   1. வரைவுமலிவு   - 7 பாடல்கள்
   2. அறத்தொடுநிற்றல்   - 17 பாடல்கள்
   3.உடன்போக்கு   - 17 பாடல்கள்
   4.கற்பொடுபுணர்ந்தகங்கை   - 26 பாடல்கள்
   5.மீட்சி   - 6 பாடல்கள்
   6.தன்மனைவரைதல்   - 4 பாடல்கள்
   7.உடன்போக்கு இடையீடு   - 6 பாடல்கள்
   8.வரைதல்   - 1 பாடல்

அலகு–2 மதுரைமீனாட்சியம்மைபிள்ளைத்தமிழ்   15 மணிகள்
காப்புப் பருவம் முதல் வருகைபருவம் வரை (60 பாடல்கள்)

அலகு–3 திருக்குற்றாலக் குறவஞ்சி   15 மணிகள்
சிங்கன் சிங்கியைத் தேடல் முதல் வாழ்த்துவரை (28 பக்கங்கள்)

அலகு–4 கிள்ளைவிடு தூது (முழுவதும்)   15 மணிகள்
அலகு–5பரணியும் கலம்பகமும்   15 மணிகள்
கலிங்கத்துப் பரணி - காடுபாடியது
நந்திக் கலம்பகம் முதல் 60 பாடல்கள்

பாடநூல்:
1. தஞ்சைவாணன் கோவை செக்கப்ப நாவலர் உரை, திருநெல்வேலித் தென்னிந்திய
   சைவசித்தாந்த நூற்பதிப்புக் கழகம்.
2. மதுரை மீனாட்சி பிள்ளைத்தமிழ், குமரகுருபரசுவாமிகள், திருநெல்வேலித் தென்னிந்திய
   சைவசித்தாந்த நூற்பதிப்புக் கழகம்.
3. திருக்கற்றாலக் குறவஞ்சி,திரு. பு.சி. புன்னைவனநாத முதலியார், திருநெல்வேலித்
   தென்னிந்திய சைவசித்தாந்த நூற்பதிப்புக் கழகம்.
4. நந்திக் கலம்பகம்,புலவர் முத்துப்பிள்ளை,மாணிக்கவாசகர் பதிப்பகம், சென்னை-8
5. அழகர் கிள்ளைவிடு தூது முனை.ச.சுபாஷ் சந்திரபாஸ் , இயல் பதிப்பகம் ,தஞ்சாவூர்-1

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பார்வை நூல்கள்:

1. சிற்றிலக்கியச் சொற்பொழிவுகள் ,சைவசித்தாந்த நூற்பதிப்புக் கழகவெளியீடு,திருவல்லிக்கேணி,சென்னை.
2. சிற்றிலக்கிங்கள் சிலகுறிப்புகள்,புலம் வெளியீடு,சென்னை.
3. சிற்றிலக்கியத் திறனாய்வு, இலக்கியப் பதிப்பகம்,சென்னை.

கற்றல் கற்பித்தல் வழிமுறைகள்

1. கலந்துரையாடல்
2. சான்றுகாட்டிவிளக்குதல்
3. பின்னூட்டமுறையில் கற்பித்தல்
4. வினாநிரல் வழி பரிசோதித்தறிதலும் துலங்கலும்

கற்றல் கற்பித்தலின் விளைவுகள்

வ.எண்	கற்பித்தல் கற்றல் விளைவுகள்	மதிப்பீட்டுநிலை
1	சிற்றிலக்கியங்களைஅறிமுகம் செய்தல்	K1,
2	சிற்றிலக்கியங்களைத் தற்காலச் சூழலோடுபொருத்திக்காட்டுதல்	K1, K4,
3	தமிழரின் வீரம்,கொடை,போர்,நம்பிக்கை,சமயம், இயற்கைசார்ந்தசிந்தனைகள் ஆகியவற்றைத் தெளிவுபடுத்துதல்	K2, K3,
4	சிற்றிலக்கியங்கள் உணர்த்தும் சமூகத்தை உய்த்துணர்தல்	K2, K5, K4,
5	மக்கள் இலக்கியமாகச் சிற்றிலக்கியத்தைமதிப்பீடுசெய்தல்	K5

- K1 = கற்றலின் அறிமுகம்
- K2 = பகுத்தாய்தல்
- K3 = திறன்களைக் கண்டறிதல்
- K4 = ஒப்புநோக்கல்
- K5 = ஒருங்கிணைந்தமதிப்பீட்டின் 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	2	1	2	2	2	3	2	2	2	2	28
CO2	3	2	2	2	1	2	2	3	3	3	3	2	2	30
CO3	3	2	2	2	1	2	2	2	2	2	2	2	1	25
CO4	3	2	2	2	1	3	2	2	2	2	2	2	2	27
CO5	3	3	2	2	1	3	2	2	2	2	2	2	1	27
														137
Mean Value of Cos with PSO and Pos														2.1

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			**2.1**
Observation	**COs of Strongly related with PSOs and Pos**		

இளங்கலைத் தமிழ் இலக்கியம் -நான்காம் பருவம்

வகுப்பு: இளங்கலைத்தமிழ்	பாடம்: இலக்கணம் -அகப்பொருள்	
		நம்பியகப்பொருள்
பருவம் : நான்காம் பருவம்	நேரம் : 60 மணிகள்	
குறியீடு : 22UTLA44	மதிப்பெண் : 100	
மதிப்புப்புள்ளி : 4		

நோக்கங்கள்

- இலக்கணம் பற்றியசெய்திகளைஅறிமுகம் செய்தல்
- பண்டைக்காலவாழ்வியல் நெறிகளைமாணாக்கர்களுக்குஉடுத்துரைத்தல்
- களவுநெறியைபுரிதல்
- கற்பொழுக்கநெறிகளைஉணர்த்துதல்
- பழந்தமிழரின் அகவாழ்க்கைக் கூறுகளைப் பகுத்துணர்தல்

கூறு - 1	**18 மணிகள்**
அகப்பொருள் இலக்கணம் -வரலாறு- விளக்கம் - விளக்கம் - பாயிரச் செய்தி - அகத்திணையியல்	
கூறு - 2	**18 மணிகள்**
களவியல்	
கூறு - 3	**18 மணிகள்**
வரைவியல்	
கூறு - 4	**18 மணிகள்** கற்பியல்
கூறு - 5	**18 மணிகள்** ஒழிபியல்

கற்றல்,கற்பித்தல் முறைகள்

- விளக்குதல் முறை,விவரித்தல் முறை
- எடுத்துரைத்தல் முறை
- எடுத்துக்காட்டுதந்துவிளக்குதல்
- வினாநிரல் முறை
- இலக்கணங்களைவாழ்வியலோடுஒப்பிட்டுக்காட்டுதல்

பாடநூல்

- திருஞானசம்பந்தம் ச.(உரை.),நாற்கவிராசநம்பி இயற்றியஅகப்பொருள் விளக்கம்,கதிர்பதிப்பகம்,திருவையாறு, 2010 (மூ.ப.)

பார்வை நூல்கள்

- சுபாஷ் சந்திரபோஸ் ச. (உரை.),அகப்பொருள் விளக்கம், இயல்,தெற்கலங்கம்,தஞ்சாவூர், 2016 (மூ.ப.)

வ.எண்	கற்றலின் விளைவு	மதிப்பீட்டுநிலை
PO1	அக இலக்கண மரபுகளைஅறிந்து கொள்ளுதல்.	K1
PO2	முதல்,கரு, உரிப்பொருள் முறைகளை பயன்பாட்டு நோக்கில் பகுத்தாய்ந்து புரிந்து கொள்ளுதல்.	K2, K3
PO3	தமிழரின் வாழ்வியல் நெறிகளான களவு,கற்பு பற்றி அறிந்து	K3, K5

	கொள்ளுதல்	
PO4	பண்டைத் தமிழரின் அக வாழ்க்கை முறைகளை ஒப்புநோக்கிப் புரிந்து கொள்ளுதல்	K3, K4
PO5	பழந்தமிழரின் பண்பாட்டியலைத் அறிந்து தெளிதல்	K5

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	1	3	1	3	2	2	1	1	1	26
CO2	2	3	3	2	1	2	1	3	2	2	1	1	1	24
CO3	3	2	3	3	1	2	1	3	2	2	1	1	1	25
CO4	3	2	3	3	1	2	1	3	2	2	1	1	1	25
CO5	3	2	3	3	1	2	1	3	2	2	1	1	1	25
														125
Mean Value of Cos with PSO and Pos														1.92

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		1.92	
Observation	**COs of Strongly related with PSOs and Pos**		

வகுப்பு : இளங்கலைத்தமிழ்   பாடம் : இலக்கியமும் பெண்ணியமும்
பருவம் : மூன்றாம் பருவம்   நேரம் : 75மணிகள்
குறியூடு : **22UTLE44**   மதிப்பெண் : 100

நோக்கங்கள்

- பெண்,பெண்ணியம் தோற்றம் வளர்ச்சிஅறிமுகம் செய்தல்.
- தமிழ்க் கவிதைகளில் பெண்ணியவெளிகளைவிளங்கவைத்தல்.
- நாடகத்தில் பெண்ணியச் சிந்தனையைவிளக்கியுரைத்தல்.
- காப்பியங்களில் பெண்ணுக்கானஆளுமையைவிவரித்தல்
- நாட்டுப்புறவெளியில் பெண்ணின் இருப்புநிலையையெடுத்துரைத்தல்.

அலகு—1   15மணிகள்
பெண்ணியம் அறிமுகம்

பெண்ணியவிளக்கமும்-கொள்கைகளும்>பெண்ணியமும் இலக்கியமும் விளக்கம்- பெண் - வார்ப்பு-பொருள் விளக்கம்- வாசிப்பும் பெண்ணும்- இலக்கியத்தில் பெண்- தமிழ் இலக்கியத்தில் பெண் கருத்தாக்கம் - பெண்ணியம் தோற்றமும் வளர்ச்சியும்.

அலகு—2   15 மணிகள்
பெண்ணியகவிதைஉலகில் - பெண்

கவிதையும் பெண்ணும் - பெண்மொழி- தமிழ்கவிதைகளில் பெண்மொழி- பெண் உடல்மொழி - பெண்ணியவெளிகள்- பெண் எழுத்து - பெண்ணியஎழுத்து- பெண் மரபுகவிதைதொடங்கிநவீனகவிதைவரை- பாலியல் தகவலமைவுகவிதைகளில் பெண்.

அலகு—3   15மணிகள்
சிறுகதை>நாடகம் -பெண்ணியம்

பெண்ணியசிறுகதைகளில் பெண்>கூத்து- நாடகம்- நவீனநாடகத்தில் பெண்- பெண்மொழி- நாடகவெளியில் -பெண்சந்திக்கிற இடர்பாடுகள் -தீர்வுகள்- தமிழில் நவீனநாடகத்தில் - பெண் ஆளுமைகள்- அவர்களதுபடைப்புபற்றியகருத்து.

அலகு—4
        15மணிகள்ம்பெரும் காப்பியத்தில் பெண்ணியசிந்தனை- Iச்சிறுகாப்பியத்தில் பெண்-பிற்காலகாப்பியங்களில் பெண் கருத்தியல் - சிற்றிலங்களில் பெண்ணியகருத்தமைவு-
(குற்றாலகுறவஞ்சி>முக்கூடல் பள்ளு>உலா>பிள்ளைத்தமிழ்)

அலகு—5
        15மணிகள்நாட்டுப்புறவியலில் பெண் - தொழில்-பழமொழி- விளையாட்டு-நம்பிக்கைகளில் பெண்ணின் நிலை- நாட்டுப்பாடலில் பெண்- நாட்டுப் பெண்ணும் - செவ்வியல் ச%fபெண்ணும்

பாடநூல்கள்

1. பேரா.அரங்கமல்லிகா - பெண்ணின் வெளியும் இருப்பும்,நியூ செஞ்சுரிபுக் ஹவுஸ்,சென்னை-98, 2008 (மு.ப)
2. சாரதாம்பாள் -அடிக்கருத்துக் கொள்கைகளும் திறனாய்வுஅணுகுமுறைகளும்,மதுரைகாமராசர்பல்கலைக்கழகப் பதிப்புத்துறை, 2000
3. நளினிதேவி.ந - தமிழ் இலக்கியமரபும் புதுமையும்,காவ்யாபதிப்பகம்,சென்னை. 2008.

4. பிரேமா.இரா - பெண்ணியம்,தமிழ்ப் புத்தகலாயம்,சென்னை.
5. பிரேமா.இரா பெண் மரபிலும் இலக்கியத்திலும்,தமிழ்ப் புத்தகலாயம்,சென்னை.

பார்வை நூல்கள்:

1. முத்துசிதம்பரம் - பெண்ணியம் தோற்றம் வளர்ச்சி,முத்துச் சிதம்பரம் பதிப்பகம்,திருநெல்வேலி -2.
2. இராஜம் கிருஷ்ணன் - காலந்தோறும் பெண்மை,நாம் தமிழர்பதிப்பகம், சென்னை.2011(மு.ப)
3. அரங்கமல்லிகா- தமிழிலக்கியமும் பெண்ணியமும்,நியூ செஞ்சுரிபுக் ஹவுஸ்,சென்னை, 2002
4. பிரேமா.இரா - பெண்ணியம்,தமிழ்ப் புத்தகலாயம்,சென்னை.
5. பிரேமா.இரா பெண் மரபிலும் இலக்கியத்திலும்,தமிழ்ப் புத்தகலாயம்,சென்னை.
6. சுசிலாஎம்.ஏ - தமிழ் இலக்கியவெளியில் பெண்மொழியும் பெண்ணும்,மீனாட்சிப் புத்தகநிலையம்,மதுரை 2006 (மு.ப)

கற்றல் கற்பித்தல் வழிமுறைகள்

1. கரும்பலகையின் பயன்பாடு
2. காணொலிக் காட்சிமுறை
3. வினாடிவினாமுறை
4. குழு விவாதம்

கற்றல் கற்பித்தலின் விளைவுகள்

வ.எண்	கற்பித்தல் கற்றல் விளைவுகள்	புளும்சு மதிப்பீடு
1	பெண்ணியம் பற்றியவிளக்கத்தைஅறிமுகம் செய்தல்.	K1, K2
2	பெண்,பெண்ணியக் கவிதைகளில் பெண்ணியக் கருத்தியலைப் பகுத்தாய்தல்	K1, K3, K4, K2
3	பெண்ணியம் சார்ந்தநாடகங்களில் பெண்ணின் திறன்களைக் கண்டறிதல்	K2, K3, K5
4	காப்பியத்தோடுபெண்ணியக் கோட்பாட்டை ஒப்புநோக்குதல்.	K1, K2, K3,K4, K5
5	நாட்டுப்புறசமூகத்தில் பெண்ணின் ஆளுமைவெளியைவிளங்கிடச் செய்தல்	K2, K3

- ▪ K1 = கற்றலின் அறிமுகம்
- ▪ K2 = பகுத்தாய்தல்
- ▪ K3 = திறன்களைக் கண்டறிதல்
- ▪ 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
CO1	2	2	3	3	1	3	3	2	3	2	2	2	2	30
CO2	2	3	2	1	1	3	2	2	3	3	2	3	2	29
CO3	2	2	2	1	1	2	3	3	2	3	2	2	2	26
CO4	2	3	1	1	1	3	3	3	3	2	2	2	2	26
CO5	2	3	1	1	3	2	2	2	3	2	2	2	2	27
Grand Total of COs with PSOs and Pos														138
Mean Value of Cos with PSO and Pos														2.12

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 Strongly related with PSOs and Pos**		

வகுப்பு : பி.ஏ, பி.எஸ்சி	பாடம் : **Non Major Elective-2**
பருவம் : நான்காம் பருவம்	நேரம் : 45 மணிகள்
குறியீடு : **22UTLN24**	மதிப்புப்புள்ளி : 2

நோக்கங்கள்

* தமிழ் இலக்கணம் இலக்கியம் குறித்து விரிவாகப் புரிந்து கொள்ளல்
* இலக்கிய வரலாறு குறித்து அடிப்படை அறிவு பெறல்
* போட்டித்தேர்வுகளை எதிர்கொள்ளும் திறன் பெறல்
* இலக்கண இலக்கியங்களை ஒப்பிட்டுப்பார்க்கும் திறன் பெறல்
* வரலாற்று அடிப்படையில் இலக்கிய வரலாற்றினை அறிதல்

அலகு– 1   9 மணிகள்

தமிழ் மொழிவரலாறும் இலக்கணமும்:

தமிழின் தொன்மை - சிறப்பு- திராவிட மொழிகள்- தொல்லியல் ஆய்வுகள், இலக்கணக் குறிப்பு- பொருத்தமான பொருள்- பிரித்தெழுதுக- எதிர்ச்சொல்- பொருந்தாச்சொல்- சந்திப்பிழை- ஒருமைப் பன்மை- மரபுப் பிழைகள்- பிறமொழிச் சொல்- சொற்களை ஒழுங்குபடுத்துதல், வினா, விடை, வகைகள்- உவமை- எதுகை-மோனை- இயைபு-அகரவரிசை.

அலகு– 2.   9 மணிகள்

பழந்தமிழ் இலக்கியம்

சங்க இலக்கியங்கள் - பதினெண்கீழ்க்கணக்கு நூல்கள் (பண்பு- கல்வி - ஒழுக்கம் -நட்பு ஒப்புரவறிதல் - செய்நன்றி - சான்றாண்மை, பெரியாரைத் துணைகோடல்) நாலடியார், நான்மண்கடிகை,பழமொழிநானூறுமுதுமொழிக்காஞ்சி இன்னாநாற்பது இன்னாநாற்பது, இனியவைநாற்பது, சிறுபஞ்ச மூலம், ஏலாதி, சிலப்பதிகாரம், மணிமேகலை, ஐம்பெருங்காப்பியம், ஐஞ்சிறுகாப்பியம்,

அலகு– 3.   9 மணிகள்

பக்தி இலக்கியமும், சிற்றிலக்கியமும்.

பக்தி இலக்கியங்கள் - சைவ வைணவ இலக்கியங்கள்- தேம்பாவணி, சீறாபுராணம், சிற்றலக்கியங்கள் - திருக்குற்றாலக் குறவஞ்சி, கலிங்கத்துப்பரணி, முத்தொள்ளாயிரம், தமிழ்விடுதூது, நந்திக்கலம்பகம், விக்கிரமசோழன் உலா, முக்கூடற்பள்ளு உலா, பாஞ்சாலிசபதம், குயில்பாட்டு, நாட்டுப்புறப்பாடல்கள், சித்தர்பாடல்கள்.

அலகு– 4.   9 மணிகள்

மொழி அறிஞர்கள்:

மறைமலையடிகள் - பரிதிமாற்கலைஞர்- ரா. பி. சேதுப்பிள்ளை- உ. வே. சா. தேவநேயபவணார், பெருஞ்சித்திரனார், ஜி. யூ.போப், வீரமாமுனிவர் - இக்காலக் கவிதைகள் - மு. மேத்தா, ஈரோடுதமிழன்பன், அப்துல் ரஹ்மான், கலாபிரியா, கல்யாண்ஜீ, ஞானக் கூத்தன், சாலை இளந்திரையன், சாலின் இளந்திரையன், காமராசர், நேரு, காந்தி, மு. வரதராசனார். அண்ணா, ஆனந்தரங்கம்பிள்ளைஇ

அலகு– 5   9 மணிகள்

தற்கால தமிழ்மொழி

உலகளாவிய தமிழர்களின் சிறப்பு- அறிவியல் தமிழ் - இணையமாநாடுகள் - ஆங்கிலச் சொல்லுக்கு நேரான தமிழ்ச் சொல், தமிழறிஞர்பட்டியல் தயார்செய்தல், சிறுகதை, நாடகங்கள் நாவல்கள்.

பார்வை நூல்கள்:

மு.வரதராசன் - தமிழ் இலக்கிய வரலாறு
தேவிரா   - தமிழ் இலக்கியத் தகவல் களஞ்சியம்

போட்டித்தேர்வுகளில் தமிழ் : வினாத்தாள் அமைப்புமுறை

கொள்குறிவினாக்கள்: 50X1 =50

1. இலக்கியவினாக்கள் : 20 வினாக்கள் எடுக்கவேண்டும்.
2. இலக்கணவினாக்கள் : 20 வினாக்கள் எடுக்கவேண்டும்.
3. தற்காலத்தமிழ் வினாக்கள் : 10 வினாக்கள் எடுக்கவேண்டும்.

கற்றல் கற்பித்தல் வழிமுறைகள்

- வினா நிரல்
- கலந்துரையாடல்
- காணொலிக் காட்சி முறை
- மாதிரி வினாக்களை பரிசோதித்தல் முறை
- மாணவர்கள் போட்டி தேர்வுக்கானத் தகவல்களை சேகரித்தல்

வ.எண்	கற்றல் விளைவுகள்	புளும்சு மதிப்பீடு
1	அரசு போட்டித் தேர்வுக்கான உத்தி முறைகள் மற்றும் வழிமுறைகளைப் பெறச் செய்தல்	K1, K2
2	புல்வேறு மாதிரி வினாத்தாள்களை அறியச் செய்தல்	K1, K4, K2
3	அரசு போட்டித் தேர்வுக்கான திறன் பெறச் செய்தல்	K2, K3, K5
4	தமிழ் இலக்கண இலக்கிய அடிப்படைகளை கற்றல் வழி பயன்பாட்டு நோக்கிலான விளைவுகளைப் பெறச் செய்தல்	K1, K2, K3, K5
5	செய்தித்தாள் மூலம் பொது அறிவு செய்திகளை பெறச் செய்தல்	K2, K3, K5

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, PSOs & Pos
CO1	3	3	2	3	1	3	1	3	2	2	3	2	3	27
CO2	3	2	3	2	1	3	1	3	2	2	3	2	3	26
CO3	3	2	3	2	1	3	1	2	2	2	3	2	3	24
CO4	3	3	2	3	1	3	1	3	2	2	3	2	3	28
CO5	3	2	2	2	1	3	1	3	2	2	3	2	3	27
														132
												Mean Value of Cos with PSO 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	COs of Strongly related with PSOs and Pos		

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
		SEMESTER – I		
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	**Core 1** –British Prose–I	06	05
III	22UELC21	**Core 2** – English Grammar and Its Usage	06	05
III	22UELA11	**Allied 1** - 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		
		Total	**30**	**24**
		SEMESTER – II		
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	**Core 3** –British Poetry–I	06	05
	22UELC42	**Core 4** –British Prose–II	06	04
	22UELA22	**Allied 2** –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
		Total	**30**	**24**
		SEMESTER – III		
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	**Core 5** –Indian Writing in English–I	05	04
	22UELA33	**Allied 3** –History of English Literature –I	05	04
	22UELE13	**Core Elective 1** –British Fiction–I	04	03
		Core Elective 1 –Short Stories in English Translation – I		
IV	22UELN13	**Non-major Elective 1** –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	-	-
		Total	**30**	**22**
SEMESTER – IV				
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	**Core 6 –** Indian Writing in English–II	05	05
	22UELA44	**Allied 4** –History of English Literature-II	05	04
	22UELE24	**Core Elective 2** –British Fiction–II	04	03
		Core Elective 2 –Short Stories in English Translation – II		
IV	22UELN24	**Non-major Elective -2**	03	02
		Creative Writing in English		
	22UELM24	**Non-Major Elective 2**		
		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
		Total	**30**	**25**
SEMESTER – V				
III	22UELC75	**Core – 7** British Drama – I	05	05
	22UELC85	**Core– 8** American Literature	06	04
	22UELC95	**Core– 9** Shakespeare	04	04
	22UELD05	**Core– 10** British Poetry–II	06	04
	22UELD15	**Core– 11** English Phonetics and Phonology	04	04

IV	22USBZ15	**Skill based Elective –I** Fundamentals of Computer, Internet and Office Automation	01	01
	22USBY15	Fundamentals of Computer, Internet and Office Automation – Practical	02	01
	22USSI16	Soft Skills	02	
	22UINT15	Internship	-	01
		Total	**30**	**24**
SEMESTER – VI				
III	22UELD26	**Core – 12** British Drama- II	05	04
	22UELD36	**Core– 13** Literary Criticism and Theory	06	05
	22UELD46	**Core– 14** Women's Writing	04	03
	22UELD56	**Core– 15** New Literatures	06	05
	22UELD66	**Core– 16** Media Studies	04	04
IV	22USBZ26	**Skill based Elective-II –**Web Design	01	01
	22USBY26	Web Design – Practical	02	01
	22USSI16	Soft Skills	02	02
		Total	**30**	**25**

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
Total Credits	**96**
Part – IV	
Non-Major Electives	04
Skills Based Electives	04
Foundation Course	04
Total Credits	**12**
Part – V	02
Bridge	
Course	01
Arise	01

Self Learning Course

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: V- INDIAN WRITING IN ENGLISH – I
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022 - 2023)

Class	: II B. A. English Literature	**Part**	: III Core - 5
Semester	: III	**Hours**	: 75
Sub. Code	:	**Credit**	:4

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
➢ Identify the importance, history and relevance of Indian Writing in English
➢ understand the plot of Indian Writing in English and various themes of Indian Literature through poetry.
➢ appreciate the literary sensibility of Indian prose.
➢ familiarize with Indian Theatre in relation to its culture and tradition.
➢ summarize the condition prevalent during Pre- Independence Era in relation to caste system.

UNIT – I Introduction (15 Hours)
Introductionto Indian Literature in English
History, Significance and Relevance of Indian Writing in English
Themes and Contexts of Indian Literature in English
Major Authors and their contribution to Indian Literature in English

UNIT – II Poetry (Detailed) (15 Hours)
Rabindranath Tagore   :   Gitanjali (Song 1 and 75)
Sarojini Naidu   :   Coromandel Fishers
Nissim Ezekiel   :   Goodbye Party for Miss Pushpa T.S.
Toru Dutt   :   Our Casuarina Tree

UNIT – III Prose (Detailed) (15 Hours)
Swami Vivekananda   :   Chicago Speech of 1893
Jawaharlal Nehru   :   Kamala

UNIT – IV Drama (Detailed) (15 Hours)
Vijay Tendulkar   :   *Silence! The Court is in Session*

UNIT – V Fiction (Non-Detailed) (15 Hours)
R. K. Narayan   :   *Waiting For Mahatma*

2. Books for Study:
Mehrotra, Arvind Krishna (ed.). A History of Indian Literature in English. New York: Columbia
        University Press, 2003. Print.
Singh, Bijender. "Indian Writing in English: Critical Insights." New Delhi, Authorspress, 2014.
Gokak, V. K. *The Golden Treasury of Indo-Anglian Poetry*. New Delhi: Sahitya Akademi,
1970.Print.
Parthasarthy, R. *Ten Twentieth Century Indian Poets*. OUP, Delhi, 1976.Print.
Tendulkar, Vijay. *Silence! The Court is in Session*. Oxford University Press New Delhi, 2001. Print.
Narayan, R. K. *Waiting for Mahatma*. Chennai: Penguin Books, 2010.Print.

3. Books for Reference:

Iyengar, Srinivasa K. R. *Indian Writing in English*. New Delhi: Sterling, 1994.Print.

Naik, M. K. *A. History of Indian English Literature*. New Delhi: Sahitya Akademi, 1999.Print.

Narasimhaiah, C. D. *Makers of Indian English Literature*. Pencraft International, 2020. Print.

4. Teaching Learning Methods:
- o Chalk and talk
- o Power Point Presentations
- o Seminar
- o Quiz
- o Assignments
- o 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 and analyze the themes of Indian Literature.	K2
CO2	Examine the plot of the literary plays and novels present in Indian Writing.	K2
CO3	Appreciate the literary sensibility of Indian prose.	K3
CO4	interpret and Explain the Indian theatre in relation to its culture and tradition.	K3
CO5	represent the condition prevalent during Pre-Independence Era in relation to caste system.	K4

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	2	2	3	2	3	2	2	1	1	28
CO2	2	2	3	3	2	3	2	2	3	3	2	1	1	29
CO3	3	3	3	2	3	2	2	3	3	2	2	1	1	31
CO4	3	3	3	2	3	3	2	2	3	2	2	1	1	31
CO5	2	2	3	2	3	2	2	2	3	3	2	1	1	28
Grand total of COs with PSOs and Pos														147
Mean value of COs with PSOs and POs= 147/65														2.26

*: 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			2.2
Observation	COs of Indian Writing in English –Strongly related with PO and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

ALLIED PAPER – III HISTORY OF ENGLISH LITERATURE – I
(FROM THE OLD ENGLISH TO THE NEOCLASSICAL AGE)
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022 - 2023)

Class	: II B. A. English Literature	Part	: III Allied–III
Semester	: III	Hours	: 75
Sub. Code	:	Credit	: 4

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
➢ understand the depth of English Literature from the Old English period.
➢ develop a clear understanding of Renaissance Poetry.
➢ analyse the poems, essays and plays of the Elizabethan poets and dramatists.
➢ critically engage with the complex nature of English society from the English Civil war to the age of Restoration.
➢ examine the major characteristics of the Comedy of Manners and Mock-Heroic Poetry of the 17th and 18th centuries.

UNIT – I	**OLD AND MIDDLE ENGLISH LITERATURE**		**(15 Hours)**
	An Introduction to English Literature		
	English Literature before Chaucer		
UNIT – II	**AGE OF CHAUCER (1340 - 1400)**		**(15 Hours)**
	Geoffrey Chaucer	(1340 - 1400)	
	John Gower	(1442 - 1408)	
	John Wycliff	(1331 - 1384)	
	William Langland	(1340 - 1400)	
UNIT – III	**AGE OF SHAKESPEARE (1557 - 1625)**		**(15 Hours)**
	Edmund Spenser	(1552 - 1599)	
	Sir Philip Sidney	(1554 - 1586)	
	University Wits		
	William Shakespeare	(1564 - 1616)	
	Francis Bacon	(1561 - 1626)	
	Ben Jonson	(1573 - 1637)	
UNIT – IV	**AGE OF MILTON (1625 - 1660) AND RESTORATION**		**(15 Hours)**
	The Metaphysical Poets		
	The Caroline Poets		
	John Milton	(1608 - 1674)	
	John Bunyan	(1628 - 1688)	
	John Dryden	(1631 - 1700)	
	Samuel Butler	(1612 - 1680)	
	The Caroline Prose Writers		

UNIT – V   NEOCLASSICAL AGE (POPE AND JOHNSON)   (15 Hours)

Alexander Pope	(1688 - 1745)
Daniel Defoe	(1661 - 1731)
Jonathan Swift	(1667 - 1745)
Joseph Addison	(1672 - 1719)
Sir Richard Steele	(1672 - 1729)
Samuel Johnson	(1709 - 1784)
R. B. Sheridan	(1751 - 1816)

2. Books for Study:

Hudson William Henry: *An Outline History of English Literature*. New Delhi: B.I. Publications
        Pvt. Ltd, 2008. Print.

Albert Edward: *A History of English Literature.*London: Oxford University Press, 2009. Print.

Long William: *English Literature: Its History and Its Significance for the life of the English
        Speaking World*. New Delhi: Rupa & Co, 2013. Print.

3. Books for Reference:

Trivedi. R. D: *A Compendious History of English Literature.*New Delhi: Vikas Publication
        House Pvt Ltd, 2008. Print.

Peck John, Coyle Martin: *A Brief History of English Literature*. London: Palgrave, 2002. Print.

4. Teaching Learning Methods:
- ICT usage
- Peer teaching
- Role play
- 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	develop a clear understanding of the tradition of English Literature from Beowulf to Graham Greene with the major genres and forms of English Literature and develop fundamental skills required for critical thinking of the texts and concepts.	K1, K2, K3, K4
CO2	appreciate the complexity of the origin and reception of Modern English Language and Literature given its Middle English historical trajectories, particularly in relation to writers such as Chaucer, Gower, Wycliff and Langland.	K1, K2, K3, K4
CO3	analyse and appreciate various forms of poetry and essays from different writers of the Elizabethan age and relate their characteristic features based upon the social, political and historical contexts and experiences.	K1, K2, K3, K4
CO4	discover and examine critically the key themes in major texts of the period, including Sin, Transgression, Love, Pride, revenge,	K1, K2, K3, K4

	sexuality and human follies.												
CO5	examine and analyse the form and function of satire through several variations of Classicism in the eighteenth century and map the relationship between the formal and the political in the literature of the neo-classical period.												**K1, K2, 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	3	3	2	2	2	2	2	2	2	2	2		29
CO2	3	3	3	3	2	3	2	2	2	3	2			28
CO3	3	3	3	2	3	2	2	3	2	2	2	2		32
CO4	3	3	3	2	3	3	2	2	3	2	2			28
CO5	2	3	3	2	3	2	2	2	2	3	2		2	30
Grand total of COs with PSOs and Pos														138
Mean value of COs with PSOs and POs= 147/58														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 History of English literature –Strongly related with POs and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE ELECTIVE - I: BRITISH FICTION - I
(NEO-CLASSICAL TO AGE OF TENNYSON)
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022 - 2023)

Class	: II B. A. English Literature	Part III : Core Elective - 1
Semester	: III	Hours : 60
Sub. Code	:	Credits : 3

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
  ➢ make learners learn the origin and the development of novel in the Enlightenment era.
  ➢ acquire the knowledge of Gothic literature.
  ➢ expose the readers to the domestic novels of the early Victorian age.
  ➢ make learners familiar with historical themes in British fiction.
  ➢ inform the societal changes to the learners through Victorian novels.

UNIT – I (12 Hours)
  Henry Fielding : *Joseph Andrews*
UNIT – II (12 Hours)
  Anne Redcliff : *Mystery of Udolpho*
UNIT – III (12 Hours)
  Jane Austen : *Pride and Prejudice*
UNIT – IV (12 Hours)
  Sir Walter Scott : *Kenilworth*
UNIT – V (12 Hours)
  Charles Dickens : *Christmas Carol*

2. Books for Study:
Fielding, Henry. *Joseph Andrews*. London: Rutland, 1991.Print.
Redcliff, Anne. *Mystery of Udolpho*. New Delhi: Penguin, 2001. Print.
Austen, Jane. *Pride and Prejudice*. New Delhi: Fingerprint, 2013.Print.
Scott, Sir Walter. *Kenilworth.* London: Penguin Revised Edition*,* 1999.Print.
Dickens, Charles. *Christmas Caroll*. New Delhi: Fingerprint, 2015. Print.

3. Books for Reference:
Forster, E. M. *Aspects of the Novel.* London: Penguin, 2005. Print.
Lubbock, Percy. *The Craft of Fiction.* New York: IMPACT Global Publishing, Inc. USA, 2015.Print.
Muir, Edwin. *Structure of the English Novel.* London: Read Books, 2006. Print.

4. Teaching Learning Methods:
  ○ Role Play
  ○ Group Discussion
  ○ Video Lectures
  ○ Screening Movies
  ○ Giving lectures

5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	make the learners understand the origin of the English novel and also knowing complex moral situations by reading them. It makes them understand what is strong romantic love and its complications such as, jealousy, marriage, divorce and betrayal.	**K1, K2, K3, K4**
CO2	acquire knowledge of different kinds of novels and getting exposure to Gothic novels and their narrative technique. They come to know the incidents of physical and psychological terror and also the blending of supernatural events in novels and help them to explore human feelings and emotions.	**K1, K2, K3, K4**
CO3	expose the learners to the world of domestic novels and analyse and appreciate various themes handled by the writers. It makes them learning the novel of manners and also the place of middleclass women.	**K1, K2, K3, K4**
CO4	make learners aware of history of many countries through novels. They understand the inner lives of the people across time and place besides narrating the untold stories of history. These novels enable the readers to experience a more complex truth.	**K1, K2, K3, K4**
CO5	make learners to present the life of the child labourers in the industries and interpreting their empathy through reading ghost stories.	**K1, K2, 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	2	2	3	2	3	2	3	2	3	1	1	29
CO2	3	3	3	3	2	3	2	2	2	3	3	1	1	31
CO3	3	3	3	2	3	2	2	3	2	2	3	1	1	30
CO4	3	3	2	2	3	3	2	2	3	2	3	1	1	30
CO5	2	3	3	2	3	2	2	2	2	3	3	1	1	29
Grand total of COs with PSOs and Pos														149
Mean value of COs with PSOs and POs= 149/65														2.2

*: 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=			2.2
Observation	COs of British Fiction I –Strongly related with POs and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE
CORE ELECTIVE – I SHORT STORIES IN ENGLISH TRANSLATION - I
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022 - 2023)

Class	: II B. A. English Literature	Part	: III NME
Semester	: IV	Hours	: 60
Sub. Code	:	Credit	: 3

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
➢ introduce the short stories from various Indian Languages.
➢ understand the great Indian literary tradition from regional languages.
➢ expand the focuses on critical concepts and the diversity of experience.
➢ obtain the themes reflected in contemporary stories.
➢ assimilate themselves on cultural contexts and narrative construction.

UNIT – I **(12 Hours)**
Introduction to Short Story
History of Short Story
Introduction to Translation

UNIT – II **(12Hours)**
Birds (Hindi)	-	Nirmal Verma
The Curd Seller (Kannada)	-	MastiVenkatesha Iyengar
The Cock-fight (Kashmiri)	-	Amin Kamil

UNIT – III **(12Hours)**
Birthday (Malayalam)	-	Vaikom Muhammad Basheer
Gold from the Grave (Marathi)	-	Annabhau Sathe
Tadpa (Oriya)	-	Gopinath Mohanty

UNIT – IV **(12Hours)**
The Taxi Driver (Punjabi)	-	Kartar Singh Duggal
The Compromise (Rajasthani)	-	VijaydanDetha
Very Lonely, She (Sindhi)	-	Motilal Jotwani

UNIT – V **(12Hours)**
The Redemption (Tamil)	-	Pudhumaipithan
Rose Attar (Telugu)	-	SripadaSlibrahmanya Sastry
Tiny's Granny (Urdu)	-	IsmatChughtai

2. Books for Study:
Basnett, Susan.*Translation Studies*.New York: Routledge, 2013. Print.
Bhardwaj, Renu. Ed. *Contemporary Indian Literature in English Translation: An Anthology*. Indira
        Gandhi National Open University, 2017. Print.
Bhattacharya, Bhabani. Ed. *Contemporary Indian Short Stories (Set of 4 Volumes)*. Sahitya
Akademi, Delhi, 2016. Print.
Prasad B. A Background to the Study of English Literature. New Delhi: Trinity PressPublication,
1999.

Rees. R. J. English Literature:An Introduction for Foreign. New Delhi: Macmillan, 1973. Print.

3. Books for Reference:

Glimpses: The Modern Indian short Story, Published by East West Press Ltd., New Delhi, 1981. Print.

Abdulla, V. *Poovan Banana and Other Stories,* trans. Sangam Books, Madras, 1983. Print.

Breast Stories. Translated by Gayatri Chakravorty Spivak. Kolkata: Seagull, 1997. Print.

The Hill Station and Other Stories, Calcutta Writers workshop, 1973. Print.

Asaduddin, M. *IsmatChughtai*(Monograph in the series, "Makers of Indian Literature"), New Delhi,

       Sahitya Akademi, 1999. Print.

Kapse, Dhananjay, Ed. *Modern Indian Writing in Translation*. 2016. Print.

4. Teaching Learning Methods:

- o ICT usage
- o Peer teaching
- o Role play
- o Creative assignments
- o 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	introduce the short stories from various Indian Languages	**K1**
CO2	understand the great Indian literary tradition from regional languages	**K2**
CO3	expand the focuses on critical concepts and the diversity of experience	**K3**
CO4	obtain the themes reflected in contemporary stories	**K4**
CO5	assimilate themselves on cultural contexts and narrative construction	**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	2	2	2	3	3	2	2	2	3	1	1	28
CO2	3	3	3	3	2	3	3	2	2	3	3	1	1	32
CO3	3	3	3	2	3	3	3	3	2	2	3	1	1	32
CO4	3	3	2	2	3	3	3	2	3	2	3	1	1	31
CO5	2	3	3	2	3	3	3	2	2	3	3	1	1	31
Grand total of COs with PSOs and Pos														154
Mean value of COs with PSOs and POs= 154/65														2.3

*: 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=			2.3
Observation	COs of **SHORT STORIES IN ENGLISH TRANSLATION - I** –Strongly related with POs and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

NON-MAJOR ELECTIVE – I: BUSINESS ENGLISH
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022-2023)

Class	: II UG	Part	: III NME-1
Semester	: III	Hours	: 45
Sub. Code	:	Credit	: 2

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
  ➢ acquire the skills of academic writing
  ➢ frame well-structured sentences
  ➢ enrich themselves in business communication
  ➢ practice vocabulary and expressions in day to day context
  ➢ acquire the skills of academic writing

UNIT – I   **(09 Hours)**
      Basics of Writing
      Spotting errors
      Précis Writing

UNIT – II   **(09 Hours)**
      Sentence Completion
       Minutes of Meeting
       Writing Agenda

UNIT – III   **(09 Hours)**
Letter Writing
      Report Writing
      Writing E-mail

UNIT – IV   **(09 Hours)**
      Spelling
      Vocabulary
      Conventional and idiomatic expressions

UNIT – V   **(09 Hours)**
      Business specific Language phrases
      Spoken English
      Writing CV

2. Books for Study:
Bhatnagar, R. P. *English for Competitive Examinations*. Laxmi Publications, 2008. Print.
Badger, Ian. English for Work: Everyday Business English. Paperback, 2003. Print.

3. Books for Reference:
Aggarwal, R.S. *Objective General English*. New Delhi: S Chand Publishing, 2017. Print.

Philips, Sam. *3000 Synonyms and Antonyms.* New Delhi: Goodwill's Publishing House, 2019. Print.

Sasikumar, V. *Communicational Skills in English*. Cambridge University Press India Pvt, 2009. Print.

4. Teaching Learning Methods:
- o ICT usage
- o Peer teaching
- o Role play
- o Creative assignments
- o 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	implement the skills of academic writing.	**K2**
CO2	represent errorless sentences.	**K2**
CO3	distinguish themselves in business communication.	**K4**
CO4	integrate vocabulary and expressions in day to day context.	**K4**
CO5	analyze and enhance interpersonal skills in communication.	**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	2	2	2	2	3	2	2	2	3	2	2	29
CO2	3	3	3	3	2	3	3	2	2	3	3	3	2	35
CO3	3	3	3	2	3	2	3	3	2	2	3	3	2	34
CO4	3	3	2	2	3	3	3	2	3	2	3	3	2	34
CO5	2	3	3	2	3	2	3	2	2	3	3	3	2	33
Grand total of COs with PSOs and Pos														145
Mean value of COs with PSOs and POs= 165/65														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 Business English –Strongly related with POs and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE PAPER –VI: INDIAN WRITING IN ENGLISH – II
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year – 2022-2023)

Class	: II B. A. English Literature	Part	: III Core - 6
Semester	: IV	Hours	: 75
Sub. Code	:	Credit	: 5

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
➢ enable the students to appreciate Indian style.
➢ expose the students to Indian thoughts.
➢ intensify the studies of Indian Writing in English.
➢ expose the students' wealth of Indian theatrical riches.
➢ help the students appreciate the beauty of Indian novels.

UNIT – I POETRY (Detailed) **(15 Hours)**
Gieve Patel	:	On Killing a Tree
Keki N. Daruwalla	:	Migrations
Arvind Krishna Mehrotra	:	On the Death of the Sunday Painter
Shiv K. Kumar	:	Indian Woman

UNIT – II PROSE (Detailed) **(15 Hours)**
A. P. J. Abdul Kalam	:	My Visions for India

UNIT – III DRAMA (Non-Detailed) **(15 Hours)**
Girish Karnad	:	*Hayavadana*

UNIT – IV SHORT STORIES (Non-Detailed) **(15 Hours)**
Anita Desai	:	A Devoted Son
Ruskin bond	:	Tiger in the house
Mahasweta Devi	:	Giribala

UNIT – V NOVEL(Non-Detailed) **(15 Hours)**
Sudha Murthy	:	D*ollar Bahu*

2. Books for Study:
Adiga, Arvind.*Selection Day*. New Delhi: Scribner, 2017. Print.
Gokak, V. K. *The Golden Treasury of Indo-Anglian Poetry*. New Delhi: Sahitya Akademi, 1970. Print.
Parthasarthy, R. *Ten Twentieth Century Indian Poets*. New Delhi: OUP, 1976. Print.
De Souza, Eunice. *Nine Indian Women Poets: An Anthology.* London: Oxford University Press, 2001. Print.
Murthy, Sudha. *DollarBahu*. New Delhi: Penguin Books, 2007. Print.

3. Books for Reference:
Iyengar, Srinivasa. K. R. *Indian Writing in English*. New Delhi: Sterling, 1994. Print.
Naik, M. K. *A History of Indian English Literature*. New Delhi: Sahitya Akademi, 1999. Print.

4. Teaching and Learning Methods:
- o Chalk and talk
- o Seminar
- o Brain storming
- o Quiz
- o Assignments
- o 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	understand the subject and appreciate the beauty of Indian writings.	K2
CO2	identify and interpret Indian thought and philosophy.	K2
CO3	discover the uniqueness of Indian writings.	K3
CO4	critically evaluate the subject.	K3
CO5	compare and judge the beauty of Indian novels.	K4

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	2	2	2	2	2	2			24
CO2	3	3	3	3	2	3	2	2	2	3	2			28
CO3	3	3	3	3	3	2	2	3	2	2	2			28
CO4	3	3	2	2	3	3	2	2	3	2	2			27
CO5	2	3	3	2	3	2	2	2	2	3	2			26
Grand total of COs with PSOs and Pos														146
Mean value of COs with PSOs and POs= 133/55														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 Indian Writing in English II –Strongly related with POs and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

ALLIED PAPER – IV: HISTORY OF ENGLISH LITERATURE – II
(FROM THE AGE OF TRANSITION TO THE MODERN AGE)
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022 - 2023)

Class	: II B. A. English Literature	Part	: III Allied – IV
Semester	: IV	Hours	: 75
Sub. Code	:	Credit	: 4

1. Course Educational Objectives:
Upon the completion of the course the students will be able to:
 ➢ understand the history of the English literary texts.
 ➢ trace out the development of the literary style of various Ages.
 ➢ assimilate the emergence of the female writers.
 ➢ critically approach literary style of the novelists.
 ➢ analyse the different socio-cultural context of various centuries through various genre.

UNIT – I	**THE AGE OF TRANSITION (1745 – 1798)**		**(15 Hours)**
	Samuel Richardson	(1689 – 1761)	
	Henry Fielding	(1707 – 1754)	
	Oliver Goldsmith	(1728 – 1774)	
	Thomas Grey	(1716 – 1771)	
	Robert Burns	(1759 – 1796)	
	William Blake	(1757 - 1827)	
UNIT – II	**THE ROMANTIC AGE (1798 – 1832)**		**(15 Hours)**
	William Wordsworth	(1770 – 1850)	
	S. T. Coleridge	(1772 – 1834)	
	Lord Byron	(1788 – 1824)	
	P. B. Shelley	(1792 – 1822)	
	John Keats	(1795 – 1821)	
	Sir Walter Scott	(1775 - 1834)	
	Jane Austen	(1775 - 1817)	
UNIT – III	**EARLY VICTORIANS (1832 – 1887)**		**(15 Hours)**
	Alfred Lord Tennyson	(1809 – 1892)	
	Robert Browning	(1812 – 1889)	
	Matthew Arnold	(1822 – 1888)	
	Thomas Carlyle	(1795 – 1881)	
	John Ruskin	(1819 – 1990)	
	Charles Dickens	(1812 – 1870)	
	George Eliot	(1819 – 1880)	
UNIT – IV	**LATE VICTORIANS (1880 – 1930)**		**(15 Hours)**
	Oscar Wilde	(1856 – 1900)	
	Thomas Hardy	(1840 – 1928)	

G. M. Hopkins		(1844 – 1889)	
G. B. Shaw		(1856 – 1950)	
Joseph Conrad		(1857 – 1924)	
H. G. Wells		(1866 – 1946)	

UNIT – V   **THE PRESENT AGE**   **(Since 1930)**   **(15 Hours)**

W. B. Yeats	(1865 – 1939)	
James Joyce	(1882 – 1941)	
Virginia Woolf	(1882 – 1941)	
D. H. Lawrence	(1885 – 1930)	
T. S. Eliot	(1888 – 1965)	
Malcolm Bradbury	(1932 - 2000)	
Edward Bond	(1934 -)	

2. Books for Study:

Albert, Edward. *History of English Literature.* New Delhi: Oxford University Press,1979. Print.

Hudson, William Henry. *An Outline History of English Literature*. New Delhi: B. I.
          Publications Pvt. Ltd, 2008. Print.

Long, William J. *English Literature: Its History and Its Significance for the Life of English Speaking*
          World. New Delhi: AITBS publishers, 2018. Print.

3. Books for Reference:

Peck, John and Martin Coyle. *A Brief History of English Literature.* New York: Palgrave,2002.
Print.

Carter, Ronald and John McRae. *The Routledge History of Literature in English.* London:
Routledge,   2017. Print.

Trivedi, R.D. *A Compendius History of English Literature*. Noida: Vikas PublishingHouse Pvt. Ltd,
          2018. Print.

4. Teaching Learning Methods:

- o Lecturing
- o ICT
- o Class room quiz
- o 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	understand the sequence of the fertile imagination and emotion from the Romantic Age and create the verse of their own.	K2
CO2	trace out the emergence of the literary style in the Victorian Age.	K2
CO3	comprehend emergence of the second sex in English	K2
CO4	critically evaluate the literary style of the English writers of the Modern Age.	K3
CO5	analyse the cultural setup of various centuries through various literary genre.	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	3	2	2	2	2	2	2	2	2			25
CO2	3	3	3	3	3	3	2	2	2	3	2			29
CO3	3	2	2	3	3	2	2	3	2	2	2			26
CO4	3	2	2	2	2	3	2	2	3	2	2			25
CO5	2	3	3	2	3	2	2	2	2	3	2			26
Grand total of COs with PSOs and Pos														131
Mean value of COs with PSOs and POs= 131/55														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 History of English Literature –Strongly related with POs and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

CORE ELECTIVE: II – BRITISH FICTION – II
(AGE OF THOMAS HARDY TO CONTEMPORARY AGE)
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year2022-2023)

Class	: II B. A. English Literature	Part III : Core Elective - 2
Semester	: IV	Hours : 60
Sub. Code	:	Credit : 3

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
  ➢ explore the historical and cultural background of the age.
  ➢ analyze literary works within the socio-political and cultural contexts.
  ➢ enhance the knowledge of the distinct narrative styles.
  ➢ appreciate the aesthetic nature of the fictional works.
  ➢ critically assess the various strands of fiction.

UNIT – I   **(12 Hours)**
    Thomas Hardy   :   *The Mayor of the Casterbridge*
UNIT – II   **(12 Hours)**
    Virginia Woolf   :   *To the Lighthouse*
UNIT – III   **(12 Hours)**
    Graham Greene   :   *Heart of the Matter*
UNIT – IV   **(12 Hours)**
    George Orwell   :   *Nineteen Eighty-Four*
UNIT – V   **(12 Hours)**
    Doris Lessing   :   *The Memoirs of a Survivor*

2. Books for Study:
Greene, Graham. *The Heart of the Matter*. New Delhi: Important Books, 2013. Print.
Hardy, Thomas. *The Mayor of the Casterbridge*. Noida: Penguin, 2003. Print.
Lessing, Doris. *The Memoirs of a Survivor*. New Delhi: Vintage Books, 1998. Print.
Orwell, George. *Nineteen Eighty-Four*. Chennai: Rupa, 2012. Print.
Woolf, Virginia. *To the Lighthouse*. London: Hogarth, 1929. Print.

3. Books for Reference:
Forster, E. M. *Aspects of the Novel.*New York: Mariner Books, 1956.Print.
Lubbock, Percy. *The Craft of Fiction.*New Delhi: FQ Classics, 2007.Print.
Muir, Edwin. *Structure of the English Novel.*London: Hogarth Press,1994.Print.

4. Teaching Learning Methods:
    o Chalk and Talk
    o Power Point Presentations
    o Peer Teaching
    o Group Discussion
    o   Screening movie adaptation of the novel

5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	tabulate the historical background of the age.	K1, K2
CO2	detect literary works within the socio-political and cultural contexts.	K4
CO3	discuss various narrative styles.	K2
CO4	examine the aesthetic nature of the fictional works.	K2, K4
CO5	identify and assess the various elements of fiction.	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	2	2	2	2	2	2	2	2	2			23
CO2	3	3	3	2	2	3	2	2	2	3	2			27
CO3	3	2	2	3	3	2	2	2	2	2	2			25
CO4	3	2	3	2	2	3	2	2	3	2	2			26
CO5	3	3	3	2	3	2	2	2	2	3	2			27
Grand total of COs with PSOs and Pos														128
Mean value of COs with PSOs and POs= 128/55														2.3

*: 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			2.3
Observation	COs of British Fiction II –Strongly related with POs and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE
CORE ELECTIVE 2 – SHORT STORIES IN ENGLISH TRANSLATION - II
(Outcome Based Syllabus under CBCS Structure for the Students admitted from the
Academic Year 2022-2023 onwards)

Class   : II B. A. English Literature   Part III : Core Elective - 2
Semester   : IV   Hours : 60
Sub. Code   :   Credit : 3

1. Course Educational Objectives:

Upon completion of the Course the students will be able to:
- ➢ attain accessibility to regional as well as Global literatures and identify the socio-cultural values in these short stories.
- ➢ understand in terms of themes, techniques and culture
- ➢ appreciate the literary sensibility of the Indian stories
- ➢ develop critical sensibility and analysis and interpretation of literary texts.
- ➢ read cultural context and develop a critical understanding.

Unit – I   **(12 Hours)**
Alexander Pushkin (Russian)   : The Shot
Leonid Andreyev (Russian)   : The City

Unit – II   **(12 Hours)**
Guy de Maupassant (French)   :The Necklace
Albert Camus (French – Algerian)   : The Guest

Unit – III   **(12 Hours)**
Indira Goswami (Indian, Assamese)   :The Empty Chest
Mahasweta Devi (Indian,Bengali)   :Salt

Unit – IV   **(12 Hours)**
Hwang Sun-Won (Korean)   :Lost Souls
Ngugi waThiong'o (Kenyan)   : The Upright Revolution: Or Why Humans Walk
                                          Upright

Unit–V   **(12 Hours)**
Franz Kafka   (German)   :Resolutions
Italo Calvino   (Italian)   :The Distance of the Moon

2. Books for Study

Calvino, Italo, *Cosmicomics.The Distantace of the Moon*.Trans. William Weaver, 1968. Print.Camius, Albert. *Exile and the Kingdom.* Trans. Justin O'Brien, Henry Holt and Company, 1957. Print.

Goswami, Indra. *The Shadow of Kamakhya*. Trans. by PradiptaBorgohai, Rupa Co, 2001. Print.

Kafka, Franz. *The Collected Short Stories of Franz Kafka*.Trans.Nahum N Glatzer,Penguin
        Classics. 1988. Print.

Puskin, Alexander. *The Shot*. Translated by Peter D. Campbell, Kessinger Publishing, 2010. Print.

Sun Won, Hwang. *Lost Souls: Stories*. Trans. Brue Fulton, Columbia University Press, 2009. Print.

Thiong'o, Ngugi wa. *The Upright Revolution: Or Why Humans Walk Upright*. Trans. Sunandini

Banerjee. Seagull Books, 2019. Print.
Web Link: https://shortstoryproject.com/stories/the-city/

3. Books for Reference:
Web Links:
https://egyankosh.ac.in/bitstream/123456789/39686/1/Unit-1.pdf
https://egyankosh.ac.in/bitstream/123456789/39681/1/Unit-1.pdf

4. Teaching Learning Methods:
- o PPT
- o Peer teaching
- o Role play
- o Creative assignments
- o 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	Expose the students to the major concerns, styles and perspectives of Short stories in World literature.	**K1,K2**
CO2	Understand the textual context encompassing the social, cultural and appreciate treatment of themes.	**K2**
CO3	appreciate the prosody of of the Indian stories	**K3**
CO4	have an insight on the short stories.	**K4**
CO5	Assess critically the relationship between regional and world fiction.	**K4**

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	3	3	2	3	2	2	2	1	1	1	**27**
CO2	3	2	2	2	3	3	3	3	3	2	1	1	1	**29**
CO3	3	2	2	2	2	3	2	2	2	2	2	1	1	**26**
CO4	3	2	3	3	3	3	3	2	2	2	1	1	1	**29**
CO5	3	2	3	2	3	3	3	3	3	2	2	1	1	**31**
Grand total of COs with PSOs and Pos														**142**
Mean value of COs with PSOs and POs= 142/65														2.1

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			2.1
Observation	COs of **SHORT STORIES IN ENGLISH TRANSLATION - II** –Strongly related with POs and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

NON-MAJOR ELECTIVE–II: CREATIVE WRITING IN ENGLISH
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022 – 2023 onwards)

Class	: II B. A. English Literature	Part	: IV NME-2
Semester	: IV	Hours	: 45
Sub. Code	:	Credit	: 2

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
- ➢ understand the basics of writing.
- ➢ acquire knowledge about the art of writing.
- ➢ develop their artistic writing skills.
- ➢ enhance the craft of narrative techniques.
- ➢ widen their creative abilities in their writings.

UNIT – I   **(09 Hours)**
   Fundamentals of Creative Writing
   Meaning and Significance of Creative Writing
   Genres of Creative Writing: poetry, fiction, non-fiction, drama and other forms

UNIT – II   **(09 Hours)**
   Elements of Creative Writing
   Plot, Setting, Character, Dialogue, Style, Point of View
   Literary Devices and Figurative Language

UNIT – III   **(09 Hours)**
   Traditional Forms of Creative Writing
   Fiction: short story, novella and novel
   Poetry, Drama, Essay, Fable, Biography, Memoire and Autobiography, Travelogues,
      Diaries, Self-Narrative Writing

UNIT – IV   **(09 Hours)**
   Modern Trends in Creative Writing
   Web Content Writing and Blog Writing
   Script Writing, Journalistic Writing, Copywriting

UNIT – V   **(09 Hours)**
   Publication Tips
   Revising and rewriting, proof reading, editing
   Submitting manuscript for publication

2. Books for Study:
Demaria, Robert. *The College Handbook of Creative Writing*.4th ed., Noida: CengageLearning Inc,
      2013. Print.

3. Books for Reference:

Bulman, Colin. *Creative Writing: A Guide and Glossary to Fiction Writing*. Cambridge: Polity Press. 2007. Print.

Earnshaw, Steven, editor. *The Handbook of Creative Writing*. Edinburgh: Edinburgh University Press, 2017. Print.

4. Teaching Learning Methods:
- Chalk and Talk
- Power Point Presentations
- Work Sheets
- Video Clippings
- 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	Identify the Fundamentals of Creative Writing.	**K1**
CO2	Associate the Elements of Creative Writing.	**K2**
CO3	Demonstrate the Traditional Forms of Creative Writing.	**K3**
CO4	Categorize the Modern Trends in Creative Writing.	**K4**
CO5	Support Publication Tips.	**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	2	2	3	2	2	2	3	2	2	29
CO2	3	3	3	3	2	3	3	2	2	3	3	2	2	34
CO3	3	3	3	2	3	2	3	3	2	2	3	2	2	33
CO4	3	3	2	2	3	3	3	2	3	2	3	2	2	33
CO5	2	3	3	2	3	2	3	2	2	3	3	2	2	32
Grand total of COs with PSOs and Pos														161
Mean value of COs with PSOs and POs= 161/65													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 Creative Writing in English –Strongly related with POs and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

NON-MAJOR ELECTIVE- II ENGLISH FOR EMPLOYABILITY
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022 – 2023 onwards)

Class	: II B. A. English Literature	Part	: III NME-2
Semester	: IV	Hours	: 45
Sub. Code	:	Credit	: 2

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
➢ develop communicational skills
➢ expound the Principles of writing
➢ acquire Paraphrasing skills in writing
➢ equip the skills in grammar, vocabulary and presentation
➢ integrate themselves as critical readers and thinkers

UNIT – I (09 Hours)
  Sentence correction
  Spotting errors
  Sentence fillers
UNIT – II (09 Hours)
  Letter Writing
  Resume writing
  E-mail Writing
UNIT – III (09 Hours)
  Cloze Test
  Substitution
UNIT – IV (09 Hours)
  Minutes writing
  Report writing
  Idioms and phrases
UNIT – V (09 Hours)
  Sentence arrangement
  Reading comprehension
  Interview Techniques

2. Books for Study:
Prasad, Hari Mohan. *Objective English for Competitive Examinations,* New Delhi: Tata
    McGrawHill Education Pvt, 2013. Print.

3. Books for Reference:
Ajith, Anuradha. *Soft Skills for Aspiring Learners*. Chennai: Emerald Publishers, 2009. Print.
Gopalan and Rajagopalan. *English for Competitive Exams*. Chennai: Vijay Nicol Imprints,
    2004. Print.
Kanitha, S. *English for Employability*. Chennai: New Century, 2009. Print.

4. Teaching Learning Methods:
- ICT usage
- Peer teaching
- Role play
- 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	advance their communicational skills.	K1
CO2	explicate the Principles of writing.	K2
CO3	obtain paraphrasing skills in writing.	K3
CO4	train grammar, vocabulary and presentation.	K4
CO5	structure themselves as critical readers and thinkers.	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	2	2	2	3	3	2	2	2	3	2	2	30
CO2	3	3	3	3	2	3	3	2	2	3	3	2	2	34
CO3	3	3	3	2	3	3	3	3	2	2	3	2	2	34
CO4	3	3	2	2	3	3	3	2	3	2	3	2	2	33
CO5	2	3	3	2	3	3	3	2	2	3	3	2	2	31
Grand total of COs with PSOs and Pos														162
Mean value of COs with PSOs and POs= 161/65														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 English for Employability –Strongly related with POs and PSOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE
PROGRAMME OUTCOMES

PO1: Demonstrate profound comprehension of the concepts, theories, and principles in the disciplinary knowledge and appreciate its contextual significance.

PO2: Conceptualize the theories, formulate decision making models, and design solutions to the growing national needs together with the reflective analysis of its implications

PO3: Develop the skills of analytical reasoning and associate the relevance of the theoretical concepts in various perspectives

PO4: Critically evaluate the practical utility of translating theory into praxis and lab into land towards societal upliftment.

PO5: Undertake creative research initiatives with innovative Trans-disciplinary approach for catering the contemporary needs of rural development.

PO6: Empower themselves by digital, communication, programming and professional skills for a suitable career in this competitive globe.

PO7: Engage in self-directed and life-long learning and elicit optimal personality by rising in leadership qualities, active involvement in teamwork, and collaboration with the members of the diverse cultural groups in the society.

PO8: Emerge as responsible citizens with the awareness of their role in promoting environmental sustainability and gender equity together with the adsorption of ethical, social, moral and cultural values.

Programme Specific Outcome

At the end of the course the student of English Language and Literature will be able to:

1. Attain accessibility to regional as well as Global literatures and identify the socio-cultural values in these literatures.

2. Critique the literary texts in terms of language, social, cultural, political and ecological issues.

3. Develop critical sensibility and get an outlet for the analysis and interpretation of literary texts.

4. Sensitise the gender issues and appreciate Gyno and Andro texts in the literary arena.

5. Imbibe the mechanics of research and its methodologies through projects and get placed in the global market.

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE & LITERATURE
M.A. English Literature Course Pattern (OBE)
(Outcome Based Syllabus under CBCS Structure for the Students admitted
from the Academic Year 2022-2023 onwards)

Part	Subject Code	Paper	Hours	Credit
		Semester I		
III	22PELC11	**Core 1**: British Literature – I	06	05
	22PELC21	**Core 2**: Indian Writing in English	06	05
	22PELC31	**Core 3**: American Literature	06	05
	22PELC41	**Core 4**: Language and Linguistics	06	05
	22PELE11	**Core Elective 1**: Journalism and Mass Media	06	04
		Core Elective 1: An Introduction to Film Studies		
			30	**24**
		Semester II		
III	22PELC52	**Core 5**: British Literature – II	06	05
	22PELC62	**Core 6**: Shakespeare	06	05
	22PELC72	**Core 7**: Indian Regional Literatures in English Translation	06	05
	22PELE22	**Core Elective 2**: Translation Studies and Practice	06	04
		Core Elective 2: An Outline History of English Language		
	22PELN12	**Non-Major Elective 1**: English for Competitive Examinations	04	04
	22PLFS12	**Non-Major Elective 2**: Life Skills	02+2*	02
			30	**25**
		Semester III		
III	22PELC83	**Core 8**: British Literature – III	06	05
	22PELC93	**Core 9**: New Literatures	06	05
	22PELD03	**Core 10**: World Literatures in Translation	06	05
	22PELD13	**Core 11**: Gender Studies	06	05
	22PELE33	**Core Elective 3**: Research Methodology	06	04
		Core Elective 3: Academic Writing		
			30	**24**
		Semester IV		
III	22PELD24	**Core 12**: English Language Teaching in Practice	06	05
	22PELD34	**Core 13**: Literary Criticism: Theory and Practice	06	05
	22PELE44	**Core Elective 4**: English Literature for NET/SET	06	04
	22PELD44	**Core Elective 4:** Content Writing		
	22PELD54	**Project Work**	12	05
			30	**19**

Total Credits

Semester	I	II	III	IV	Total
Credits	24	25	24	19	92

* represents practical outside the class hour

**SLC: M/S (2 Credits for each Course, maximum of two Courses)

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE
CORE VIII – BRITISH LITERATURE – III
(Victorian to Modern Age)
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022 – 2023 onwards)

Class   : II M. A. English Literature   Part   : III Core: 8
Semester   : III   Hours : 90
Sub. Code :   Credit : 5

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
 ➢ appreciate the chief exponents of the Victorian Age and Modern Age.
 ➢ make an analysis of the Victorian morals, values and ideals.
 ➢ associate with the prose works of the major writers of the Age.
 ➢ assess the dramatic style of Shaw and Osborne in the Modern Age of English
   Literature.
 ➢ criticize the Novella and texts in terms of themes, techniques and culture.

UNIT I – POETRY (Detailed)   **(18 Hours)**
      Alfred Lord Tennyson   :   "Tithonus"
      Robert Browning   :   "Porphyria's Lover"
      Dante Gabriel Rossetti :   "The Blessed Damozel"
      T.S. Eliot   :   "The Waste Land"
      W.B. Yeats   :   "Sailing to Byzantium"

UNIT II – POETRY(Non-Detailed)   **(18 Hours)**
      W.H. Auden   :   "The Unknown Citizen"
      Wilfred Owen   :   "Strange Meeting"
      Ted Hughes   :   "Pike"
      Philip Larkin   :   "The Whitsun Wedding"
      G.M. Hopkins   :   "The Windhover"

UNIT III – PROSE (Detailed)   **(18 Hours)**
      Matthew Arnold   :   "Study of Poetry"
      D. H. Lawrence   :   "Why the Novel Matters"

UNIT IV – DRAMA   **(18 Hours)**
      John Galsworthy   :   *The Silver Box* **(Detailed)**
      George Bernard Shaw   :   *Candida***(Non-Detailed)**

UNIT V – FICTION (Non-Detailed)   **(18 Hours)**
      George Eliot   :   *Silas Marner*
      George Orwell   :   *Animal Farm*

2. Books for Study:
      Eliot, George. *Silas Marner*. Atlantic Publishers, 2020. Print.
      Enright, Dennis Joseph & Ernst De Chickera. Ed. *English Critical Texts*. London: Oxford
            University Press, 1962. Print.
      Green, David. *The Winged Words*. Chennai: Macmillan, 1974. Print.

3. Books for Reference:

M. H. Abrams, Harpham, Geoffrey Galt. *A Glossary of Literary Terms*. United States: Wadsworth Cengage Learning, 2005. Print.

Long, J. William. *English Literature: Its History and Significance*, New Delhi: Kalyani Publishers, 2007. Print.

Perkins, David. *A History of Modern Poetry*. Cambridge, MA: Belknap of Harvard UP, 1976. Print.

Ricks, Christoher. Ed., *The New Oxford Book of English Verse*. Vol. II. New York: OUP, 1987. Print.

Sachitanandam, V (Ed). *Six English Poets*. Chennai: Macmillan. 1978. Print.

4. Teaching Learning Methods:

- ➢ Chalk and talk
- ➢ Power Point Presentation
- ➢ Seminar
- ➢ Quiz
- ➢ Assignments
- ➢ Group discussion
- ➢ Audio books
- ➢ Video Presentation

5. Course Outcome: Upon completion of the Course the student is able to

Sl. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	explain the chief exponents of the Victorian Age and Modern Age.	K2
CO2	identify the Victorian morals, values and ideals.	K3
CO3	distinguish the prose works of the major writers of the Age.	K4
CO4	organize dramatic style of Shaw and Osborne in the Modern Age of English Literature.	K3
CO5	examine Novella, its texts in terms of themes, techniques and culture.	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	2	3	3	2	2	3	2	2	1	1	29
CO2	3	3	2	2	3	3	3	3	2	2	1	1	1	29
CO3	3	3	2	2	2	3	2	2	3	2	2	1	1	28
CO4	3	3	3	3	3	3	3	2	3	2	1	1	1	31
CO5	3	3	3	2	2	3	3	2	3	2	1	1	1	29
Grand total of COs with PSOs and Pos														141
Mean value of COs with PSOs and POs= 146/65														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 British Literature III – 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 IX – NEW LITERATURES
(Outcome Based Syllabus under CBCS Structure for the Students admitted
from the Academic Year 2022-2023 onwards)

Class   : II M. A. English Literature   Part   : III Core: 9
Semester   : III   Hours : 90
Sub. Code   :   Credit : 5

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
  ➢ generate an awareness about the history, themes and theories of new literature.
  ➢ impart the knowledge of colonial expansions enacted by the British regime and various
    issues discussed by different writers with local and global social conditions.
  ➢ compose the students understand the East – West cultural conflicts.
  ➢ make the students differentiate regional and global literature.
  ➢ enable the students explores various styles of literary genres around the globe.

UNIT I (18 Hours)
    Differentiating New Literatures from Commonwealth Literature
    History of New Literatures in English
    Recurring themes, theories and tropes
    Critical reflection of colonial experience

UNIT II
    POETRY (Detailed) (18 Hours)
    Chitra Banerjee (Indian-American)   :   "Indigo"
    Kamala Wjratne (Sri Lankan)   :   "To a Student"
    Allen Curnow (Australian)   :   "Time "

UNIT III (18 Hours)
    PROSE(Non-Detailed)
    Salman Rushdie (British-Indian)   :   An extract from Imaginary Homelands
    Chinua Achebe (Nigerian)   :   "Thoughts on the African Novel"

UNIT IV- DRAMA (Detailed) (18 Hours)
    Wole Soyinka (Nigerian)   :   *The Lion and the Jewel*

UNIT V- FICTION (Non-detailed)
    Short Story (18 Hours)
    Carold Shield (American-Canadian)   :   A Scarf
    NasibuMwanukuzi (Tanzania):   Killing Time
    Nadine Gordimer (South African)   :   Six Feet of the Country
    Henry Lawson (Australian)   :   The Drover's Wife
    Novel
    Margaret Atwood (Canadian)   :   *Surfacing*

2. Books for Study:
Hisham Mathar. *A Month in Sienna*. Canada: Penguin Random House LLC, 2019. Print.
Soyinka Wole.*The Lion and the Jewel.* OUP, New Delhi, 1974. Print.

Atwood, Margaret.*Surfacing*. London: Virago Press, 2009. Print.

Walder, Dennis. *Post-Colonial Literatures in English: History, Language, Theory*. Blackwell, 2005.

3. Books for Reference:

Ashcroft, cf. p. 2. See also Elleke Boehmer, *Colonial & Postcolonial Literature* Oxford, 1995), p. 4.

Ania Loomba, *Colonialism / Postcolonialism* (London and New York, 1998), cf. pp. xii, 7-19.

Thieme John. *The Arnold Anthology of Postcolonial Literatures in English*.UK: Hodder Education, 1996. Print.

Walsh, William. *Readings in Commonwealth Literature.* New York: Oxford University Press, 1973. Print.

Narasimhaiah, C.D. *An Anthology of Commonwealth Poetry*.Ed. New Delhi: Macmillan, 2014. Print.

Arvind Krishna, Mehrotra. *The Oxford India Anthology of Twelve Modern Indian Poets*.New Delhi: Oxford University Press, 1997. Print.

Vinay, Dharwadker. *The Oxford Anthology of Modern Indian Poetry*.New Delhi: Oxford University Press, 1998. Print.

4. Teaching Learning Methods:
- o Chalk and Talk
- o ICT usage
- o Quiz
- o Assignments
- o 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 the different dimensions of writers with local and global social conditions.	K2
CO2	analyze the knowledge of colonial expansions enacted by the British regime.	K3
CO3	critique the East – West cultural conflicts.	K3
CO4	comprehend different themes of regional and global literature.	K2
CO5	explore various styles of literary genres around globe.	K3

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	3	2	3	3	2	2	1	2	1			25
CO2	3	3	2	2	3	3	3	3	2	2	1			27
CO3	3	2	2	2	2	3	2	2	1	2	2			24
CO4	3	2	3	3	3	3	3	2	1	2	1			26
CO5	3	2	3	2	2	3	3	2	1	2	1			24
Grand total of COs with PSOs and Pos														126
Mean value of COs with PSOs and POs= 126/55														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 New Literatures – 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 X – WORLD LITERATURES IN TRANSLATION
(Outcome Based Syllabus under CBCS Structure for the Students admitted from the Academic Year 2022 - 2023onwards)

Class	: II M. A. English Literature	Part	: III Core : 10
Semester	: III	Hours	: 90
Sub. Code	:	Credit	: 5

1. Course Educational Objectives:
Upon completion of the Course the students will be able to
  ➢ acquire the basic knowledge of translated epics in world literature.
  ➢ understand cross-cultural texts and discern their literary nuances.
  ➢ classify the psychological nature expressed in world literatures.
  ➢ appreciate and evaluate in the translated works across the world.
  ➢ conceive the paradigm shift through literary reading.

UNIT I – POETRY (Detailed) (18 Hours)
  Homer : *The Odyssey* (Book - 9)
  Horace : Ode 1.11
  Pablo Neruda : If You Forget Me (Extract from The Captain's Verses)

UNIT II – PROSE (Non-Detailed) (18 Hours)
  Aristotle : *The Poetics*
  Longinus : *On the Sublime*

UNIT III - DRAMA (Detailed) (18 Hours)
  Sophocles : *Oedipus Rex*
  Henrik Ibsen : *A Doll's House*

UNIT IV - SHORT STORY(Non-Detailed) (18 Hours)
  Franz Kafka : *A Report to an Academy*
  Guy de Maupassant : *On the River*

UNIT V – FICTION(Non-Detailed) (18 Hours)
  Albert Camus : *The Stranger*
  Leo Tolstoy : *The Death of Ivan Ilych*

2. Books for Study:
Homer. *The Odyssey of Homer, Book IX: With Introduction Notes and Appendices*,
        Palala Press, 2015. Print.
Virgil. *The Aeneid*. New York: Penguin, 2010. Print.
Neruda, Pablo. *Captain's Verses*. New York: New Directions Publishing, 1972. Print.
Aristotle. *The Poetics*. New Delhi: Fingerprint! Publishing and imprint Fingerprint, 2017. Print.
Longinus. *On the Sublime*.California: Createspace Independent Pub, 2017. Print.
Sophocles. *Oedipus Rex*. Digireads.com, 2005. Print.
Ibsen, Henrik. *A Doll's House.*Noida: Maple Press*,* 2011. Print.
Camus, Albert. *The Stranger.* New York: Penguin, 2000. Print.
Tolstoy, Leo. *The Death of Ivan Ilych.* New Delhi: General Press, 2011. Print.

3. Books for Reference:

Damrosch, David. *How to Read World Literature,* John Wiley & Sons, 2009. Print.

Beard, Harry & Henderson, John. *Classics: A Very Short Introduction*, Oxford, 2000.Print.

Beaton, Roderick. *An Introduction to Greek Literature*. Oxford: Oxfords, 1994. Print.

Shneidman, N. *Russian Literature*.Toronto: University of Toronto Press, 1995. Print.

4. Teaching Learning Methods:
- o Chalk and Talk
- o ICT usage
- o Practical Sessions
- o Creative assignments
- o 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	outline the translated epics of world literature.	K2
CO2	demonstrate the cross-cultural texts.	K3
CO3	examine and analyse varied identities and cultures at the local, national and global.	K4
CO4	categorize the art forms and processes from few representative world classics.	K4
CO5	generate the paradigm shift through a strict literary reading.	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	3	3	3	3	2	2	2	2	2		2	30
CO2	3	3	2	3	3	3	3	3	3	3	3		2	34
CO3	3	2	2	2	2	3	2	2	1	2	2		2	26
CO4	3	2	3	3	3	3	3	2	1	2	1		2	28
CO5	3	2	3	2	2	3	3	2	1	2	1		2	27
Grand total of COs with PSOs and Pos														145
Mean value of COs with PSOs and POs= 145/60														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 Women Literatures in TranslationStrongly 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 XI – GENDER STUDIES
(Outcome Based Syllabus under OBE Structure for Students
from the Academic Year 2022-2023 onwards)

Class	: II M. A. English Literature	Part	: III Core - 11
Semester	: III	Hours	: 90
Sub. Code	:	Credit	: 5

1. Course Educational Objectives:
Upon completion of the course the students will be able to
➢ understand and identify the basic concepts of gender and its roles.
➢ distinguish the cultural construction of masculinity and femininity.
➢ analyze gender, race, ethnicity, class, and sexuality from socio-cultural perspectives.
➢ defend the ideologies of Lesbians, Gays, Bisexuals and Transgender.
➢ examine the subtle nuances of gender issues for their research.

UNIT I - INTRODUCTION TO GENDER STUDIES   **(18 Hours)**
    Types of Gender - Differences between Sex and Gender
    Interdisciplinary Nature of Gender Studies
    Differences between Gender Study and Women's Studies

UNIT II – POETRY (Detailed)   **(18 Hours)**

Sappho (Greek)	:	"The Anactoria Poem"
Kamala Das (Indian)	:	"The Dance of the Eunuchs"
Sylavia Plath (American)	:	"Daddy"
Cheryl Clarke (American)	:	"A Poet's Death"
Adrienne Rich (American)	:	*Twenty One Love Poems* (from 1 to 5 Poems.)

UNIT III - PROSE (Non-Detailed)   **(18 Hours)**

Barbara Smith (American)	:	"Homophobia: Why Bring It Up?"
Luce Irigaray (French)	:	"Women on the Market"
Danae Clark (American)	:	"Commodity Lesbianism"

NIT IV - DRAMA (Non-Detailed)   **(18 Hours)**

Mahesh Dattani (Indian)	:	*Seven Steps around the Fire***(Detailed)**
Edouard Bourrdet(French)	:	*The Captive***(Non-Detailed)**

UNIT V – FICTION(Non-Detailed)   **(18 Hours)**

Oscar Wilde (Irish)	:	*The Picture of Dorian Gray*
Virginia Woolf (English)	:	*Orlando*

2. Books for Study:
Abelove, Henry, et al. *The Lesbian and Gay Studies Reader.* Routledge, 1993.Print.
Bourdet, Edouard. *The Captive.* Trans. Arthur Hornblow, Jr., Brentano's Publishers, 1926. Print.
Butler, Judith. *Gender Trouble*: *Feminism and the Subversion of Identity*. 1990. Print.
Cornell, R. W. *Gender.* Cambridge: Polity press, 1995. Print.
Das, Kamala. "The Dance of the Eunuchs." Summer in Calcutta, D.C. Books (Eng), 2005. Print.
Dattani, Mahesh. *Seven Steps Around the Fire*. Surjeet Publications: New Delhi. 2016. Print.

Irigaray, Luce. "Women on the Market." *This Sex Which Is Not One*. Trans. Catherine Porter.
Ithaca: Cornell University Press, 1985. Print.
Lassell, Michael, and Elena Georgiou. *The World in Us: Lesbian and Gay Poetry of the
Next Wave: An Anthology.* New York: St. Martin Press, 2000. Print.
Plath, Sylvia. *The Collected Poems*. New York: HarperCollins, 2008. Print.
Rich, Adrienne. *Twenty One Love Poems.* New York: Effie's Press. 1977. Print.
Wilde, Oscar. *The Picture of Dorian Gray.* Om Books Classics, 2018. Print.
Woolf, Virginia. *Orlando*. Peacock Books: New Delhi. 2008. Print.
www.https://poets.org/poem/anactoria-poem

3. Books for Reference:

Freud, Sigmund. Strachey, James. *New Introductory lectures on Psychoanalysis.*(Vol. II) New York:
Norton. 1965. Print.
Jacques Lacan & The Ecole Freudienne. *Feminine Sexuality.* ed. Juliet Mitchell and
Jacqueline and Trans. Jacqueline Rose. London: Pantheon Books W. W. Norton. 1985. Print.
Lipman-Blumen J. *Gender Roles and Power*. Jew Jersey: Prentice Hall.1984. Print.
Oakley A. *Sex, Gender and Society*. London: Temple Smith, 1985. Print.
Ryan Michael & Julie Rivkin. *Literary Theory: An Anthology.* USA: Blackwell Publishing, 1998. Print.

4. Teaching Learning Methods:
- o Chalk and talk
- o Power Point Presentation
- o Seminar
- o Quiz
- o Assignments
- o 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	infer the basic concepts of gender and its roles.	K2
CO2	identify the cultural construction of masculinity and femininity.	K3
CO3	classify gender, race, ethnicity, class, and sexuality from socio-cultural perspectives.	K3
CO4	organize the ideologies of Lesbians, Gays, Bisexuals and Transgender.	K3
CO5	examine the subtle nuances of gender issues for their research.	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	2	3	3	2	2	1	2	2	1	2	28
CO2	3	3	2	2	3	3	3	3	2	2	1	1	2	27
CO3	3	2	2	2	2	3	2	2	1	2	2	1	1	25
CO4	3	2	3	3	3	3	3	2	1	2	1	1	1	27
CO5	3	2	3	2	2	3	3	2	1	2	1	1	1	26
Grand total of COs with PSOs and Pos														133
Mean value of COs with PSOs and POs= 133/60														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 Gender Studies – 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 ELECTIVE III – RESEARCH METHODOLOGY
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022 - 2023)

Class   : II M. A. English Literature   Part   : III Core Elective: 3
Semester   : III   Hours : 90
Sub. Code :   Credit : 4

1. Course Educational Objectives:
Upon completion of the course the students will be able to
➢ recall the fundamental aspects of research writing.
➢ learn collecting data for research and role of library for doing research.
➢ Know how to draft outline of the dissertation and the usage of word processor.
➢ plan the dissertation and apply the Mechanics of research writing.
➢ evaluate the literary texts and apply the various techniques required for documentation.

UNIT – I   **(18 Hours)**
Definition of Research, Types of Research – Literary and Scientific Research Area,
Survey of Literature, Working Bibliography, Research Gap, Identification of Research
Problem, Formulation of Thesis Statement, Selecting a Topic, Primary and Secondary Sources

UNIT – II   **(18 Hours)**
Data Collection, Using the Library, Conducting Research, Arriving at a Thesis Statement,
Hypothesis, Compiling a Working Bibliography

UNIT – III   **(18 Hours)**
Taking Notes, Outlining, Writing Drafts, Language and Style, Working outOutline, Plagiarism,
Avoiding plagiarism, Writing Draft-– Final Draft, Computer in Research in English

UNIT – IV   **(18 Hours)**
Planning the Dissertation - Mechanics of Writing: Spelling, Punctuation and Capitalization,
Italics, Names and Numbers, General Format, Margins, Spacing, Quotations, Page Numbers,
Corrections, Insertions, Editing and Evaluating

UNIT – V   **(18 Hours)**
Proof Reading, Documentation, Footnotes, Works Cited, MLA and APA System

2. Books for Study:
American Psychological Association. 2013. London: Publication Manual of the American
    Psychological Association. 6th ed. Print.
Dorairaj, A. Joseph. FAQs on Research in Literature and Language. Chennai: Emerald Publishers,
    2019. Print.
Gibaldi, Joseph. *MLA Handbook for Writers of Research Papers*. 8th Edition. New York:2009.
    Print.

3. Books for References:

Moore, Robert H. *Effective Writing*. New York: Holt, Rinehart and Winston, 1965. Print.

Anderson, Jonathan. *Thesis and Assignment Writing*. New York: J. Wiley & Sons, 1970. Print.

Winkler, Anthony C. and Jo Ray McCuen-Metherell. *Writing the Research Paper: A Handbook*. 8th ed. Boston: Wadsworth Cenage Learning, 2012. Print.

4. Teaching Learning Methods:
- Chalk and talk
- Power Point Presentation
- 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	acquaint with the fundamentals and the purpose of research.	K2
CO2	application of the systematic approach and research ethics.	K2
CO3	organization the research paper coherently.	K2
CO4	incorporating the mechanics of writing and Correlation of theoretical knowledge with practice.	K3
CO5	evaluation of different research sources and documentation	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	2	2	3	3	2	2	2	2	2	1	1	27
CO2	3	2	2	2	3	3	3	3	2	2	2	1	1	29
CO3	3	2	2	2	2	3	2	2	2	2	2	1	1	26
CO4	3	2	2	3	3	3	3	2	2	2	2	1	1	29
CO5	3	2	2	2	2	3	3	2	2	2	2	1	1	27
Grand total of COs with PSOs and Pos														138
Mean value of COs with PSOs and POs= 138/65														2.1

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			2.1
Observation	COs of Research Methodology- 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 ELECTIVE - III – ACADEMIC WRITING
(Outcome Based Syllabus under CBCS Structure for the Students admitted from the
Academic Year 2022-2023 onwards)

Class : II M. A. English Literature	Part : III Core Elective: 3
Semester : III	Hours : 90
Sub. Code :	Credit : 4

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
- Understand the concepts, principles, of academic writing to develop writing skills and to apply the conventions of academic writing correctly.
- Acquire the correct sense of grammar, vocabulary and punctuation.
- Gain understanding of types of paragraph, Essay writing and proof reading and final draft
- Application of the knowledge of reviewing literature, films, writing for journals, reports
- Design research project, dissertation, and official communication.

Unit – I **(18 Hours)**
Introduction to Academic writing: What is academic writing - Purpose of academic writing – Types of academic writing - Features of academic writing

Unit – II **(18 Hours)**
Grammar and Vocabulary: Sentence Structure - Choice of nouns and adjectives- Appropriate verbs and adverbs- Conjunctions and Common errors – Punctuation - Vocabulary for Writing

Unit – III **(18 Hours)**
Process of Writing: Expository, Descriptive, Narrative and Argumentative Paragraphs / Essays – Pre-Writing – Organizing - Revising, Proof-reading, Editing and Final Draft

Unit – IV **(18 Hours)**
Writing Reviews – Reviewing literature – Reviewing Films- News Writing – Feature Writing – Writing Reports: Feasibility Report – Progress Report – Evaluation Report

Unit – V **(18 Hours)**
Project Writing – Writing proposals and dissertation/ thesis - MLA Style - APA Style - Writing CVs Letter and Cover Letter – Emails – Writing Summaries – Writing Memos – Writing for Blogs

2. Book for Studies:
Alice Oshima, Ann Hogue.*Introduction to Academic Writing*. Pearson Longman,2007
Stephen Bailey. *Academic Writing: A Hand book for International Students*. Second Edition. London, Routledge. (2006)
Samantray. K.*Academic and Research Writing: A Course for Undergraduates*. Orient BlackSwan
Gene Stanford and Marie N. Smith, *Better Writing: From Paragraph to Essay,*

3. Books for Reference:
Murphy, Raymond. *Essential English Grammar,* Cambridge University Press, 2000. Print.
Thomson and Martinet.*A Practical English Grammar*.Oxford, 1986. Print.

ChampaTickoo& Jaya Sasikumar.*Writing with a Purpose*. OUP, 2015. Print.

4. Teaching and learning methods:
- o Chalk and talk
- o Power Point Presentations
- o Seminar
- o Video clippings
- o Brain storming
- o Quiz
- o 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 concepts, principles of academic writing	**K2**
CO2	use effectively English Grammar and Vocabulary	**K3**
CO3	write paragraphs and essays	**K3**
CO4	review literature and films, and write reports	**K4**
CO5	write projects, draft official communications	**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		2	2	2	2	3	3	2	2	30
CO2	3	2	2	3	3		2	2	2	3	3	3	2	2	32
CO3	3	2	2	2	3		2	2	3	3	2	3	2	2	31
CO4	3	2	2	3	3		3	2	2	3	2	3	2	2	32
CO5	3	2	2	2	3		2	2	3	2	3	3	2	2	31
Grand total of COs with PSOs and Pos															156
Mean value of COs with PSOs and POs= 156/65															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 Academic Writing- 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 XII –ENGLISH LANGUAGE TEACHING IN PRACTICE
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022-2023 onwards)

Class	: II M. A. English Literature	Part	: III Core – 12
Semester	: IV	Hours	: 90
Sub. Code	:	Credit	: 5

1. Course Educational Objectives:
Upon completion of the Course the students will be able to:
➢ apprehend the fundamental concepts and principles of language teaching.
➢ explore the psychology in language teaching through various methods.
➢ diagnose language structures and acquire the ability to teach the language skills.
➢ assess the strategies, teaching aids, and to prepare the lesson plan to teach and evaluate.
➢ integrate technology, teaching aids and ICT tools for teaching/ learning English.

UNIT I - INTRODUCTION   (18 Hours)
English in India- Basic concepts and Methods- bilingualism, multilingualism, teaching and learning-language acquisition - principles of language teaching – factors related to SLA

UNIT II - METHODS OF LANGUAGE TEACHING   (18 Hours)
Grammar Translation Method, Direct Method, Audio-Lingual Method, Audio-Visual Method, CALL, Structural Method, Functional and Notional approach, the Silent Way, Suggestopedia, Preparation of Lesson Plan.

UNIT III - TEACHING AND LEARNING SKILLS   (18 Hours)
Listening- Top-down process and bottom- up listening process
Speaking- Communicative language teaching
Reading- Different types of reading in classroom
Writing- academic writing, drafting, quick writing

UNIT IV - ICT TOOLS FOR TEACHING AND EVALUATION   (18 Hours)
Basic concepts, ICT enabled teaching- Mobile Assisted Learning, principles and constructs of classroom-based assessment; different types of tests and testing process

UNIT V –TEACHING PRACTICE   (18 Hours)
Peer teaching, Micro teaching, Practical teaching in real time classroom situation.

2. Books for Study:
Ur, Penny. *A Course in English Language Teaching*. Cambridge: Cambridge University
        Press, 2015. Print.
Richards, Jack C., and Theodore S. Rodgers. *Approaches and Methods in Language
        Teaching*. Cambridge: Cambridge University Press, 2017. Print.

Howatt, Anthony Philip Reid, and H. G. Widdowson. *A History of English Language Teaching.* New York: Oxford Univ. Press, 2011. Print.

Harmer, Jeremy. *The Practice of English Language Teaching.* UK: Pearson/Longman, 2015. Print.

Nagaraj, Geetha. English Language Teaching: Approaches, Methods, Techniques. Orient Blackswan, 2021.

Nunan, David. *Second Language Teaching and Learning*. Heinle&Heinle, 1999. Print.

Thornbury, Scott. The New A-Z of ELT: *A Dictionary of Terms and Concepts*. UK: Macmillan Education, 2017. Print.

Fulcher, Glenn, and Fred Davidson. *Language Testing and Assessment: An Advanced Resource Book*. New York: Routledge, 2010. Print.

Krishnaswamy. N. The Story of English in India. Delhi: Foundation Books, 2006. Print

3. Books for Reference:

Dianne Larsen-Freeman. *Principles and Techniques in Language Teaching* (OUP)Scrivener, Jim. Learning Teaching. Oxford: Oxford Univ. Press, 2011. Print.

Nunan, David. *Syllabus Design*. Oxford: Oxford Univ. Press, 2004. Print.

Richards, J.C. and Lockhart, C. 1996. *Reflective Teaching in Second Language Classrooms.* Cambridge: Cambridge University Press. Print.

Ellis, R. *Understanding Second Language Acquisition*. Oxford: OUP. 1991. Print.

4. Teaching and learning methods:
- ICT usage
- Audio-lingual method
- Seminars and presentations
- Creating audio book
- Peer teaching
- Creative assignments
- Flipped classrooms

5. Course Outcome: Upon completion of the Course the student is able to:

S. No.	Course Outcome	Knowledge Level (Bloom'sTaxonomy)
CO1	understand the fundamental concepts and principles of language teaching.	K2
CO2	outline the psychology in language teaching through various methods.	K2
CO3	apply language structures and acquire the ability to teach the language skills.	K3
CO4	inspect the strategies, teaching aids, and prepare the lesson plan to teach and evaluate.	K4
CO5	discover technology, teaching aids and ICT tools for teaching/ learning English.	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	3	3	3	3	2	2	2	2	2	2	2	32
CO2	3	3	3	2	3	3	3	3	2	2	2	2	2	33
CO3	3	3	2	2	2	3	2	2	2	2	2	2	2	29
CO4	3	3	3	3	3	3	3	2	2	2	2	2	2	33
CO5	3	3	3	2	2	3	3	2	2	2	2	2	2	31
Grand total of COs with PSOs and Pos														158
Mean value of COs with PSOs and POs= 158/65														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 Teaching of English as Second Language-Strongly related with PSOs and Pos		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514, MADURAI DT.
DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE
CORE XIII – LITERARY CRITICISM: THEORY AND PRACTICE
(Outcome Based Syllabus under CBCS Structure for students admitted
from the Academic Year 2022-2023 onwards)

Class	: II M.A. English Literature	Part	: III Core – 13
Semester	: IV	Hours	: 90
Sub. Code	:	Credit	: 5

1. Course Educational Objectives:
Upon completion of the Course the students will be able to
 ➢ understand various language-based theories.
 ➢ understand the Postmodern culture and texts.
 ➢ examine the society -based theories and some of the psychoanalytical terms.
 ➢ analyse Marxist ideologies and apply them in literary texts.
 ➢ comprehend and interpret some of the gender issues.

UNIT- I **(18 Hours)**
 An Introduction to Structuralism and Post Structuralism
 An Introduction to Deconstruction
 Roland Barthes – *The Death of the Author*
 Jacques Derrida – *Structure, Sign, Play in the Discourse of Human Science*

UNIT- II **(18 Hours)**
 An Introduction to Modernism and Post Modernism
 An Introduction to Psychoanalytic Criticism
 Jean – Francois Lyotard – *Defining the Postmodern* (From *Cultural Studies Reader*)
 Jacques Lacan – *The Mirror Stage as Formative of the Function of the I*
 (From *Literary Theory: An Anthology*)

UNIT- III **(18 Hours)**
 An Introduction to Feminism
 An Introduction to Marxism
 Elaine Showalter – *Towards a Feminist Poetics*
 Louis Althusser – *Ideology and Ideological State Apparatuses*
 (From *Literary Theory: An Anthology*)

UNIT- IV **(18 Hours)**
 An Introduction to New Historicism and Cultural Materialism
 An Introduction to Post Colonialism
 Stephen Greenblatt – Introduction *to The Power of Forms in the English Renaissance*
 (From *The Norton Anthology of Theory and Criticism*)
 Edward Said – Crisis in *Orientalism* (From *Modern Criticism and Theory*)

UNIT -V **(18 Hours)**
 An Introduction to Lesbian and Gay Criticism: Queer Theory
 An Introduction to Cultural Studies
 Antonio Gramsci's – *Hegemony* (From *Literary Theory: An Anthology*)

Gayle Rubin – *Sexual Transformation* (From *Literary Theory: An Anthology*)

2. Books for Study:

Barry, Peter. *Beginning Theory: An Introduction to Literary and Cultural Theory*. New Delhi: Viva Books, 2011. Print.

During, Simon. *The Cultural Studies Reader*. London and New York: Routledge, 1993. Print.

Leitch, Vincent B. *The Norton Anthology of Theory and Criticism*. New York: W. W. Norton & Company, Inc., 2001. Print.

Ryan Michael & Julie Rivkin. *Literary Theory: An Anthology*. USA: Blackwell Publishing, 1998. Print.

Wood, Nigel, & David Lodge. *Modern Criticism and Theory: A Reader*. England: Pearson, 1988. Print.

3. Books for Reference:

Eagleton, Terry. *Literary Theory: An Introduction*. New Jersey: Anniversary Edition, 1983. Print.

Habib. M. A. R. *A History of Literary Criticism: From Plato to the Present.* USA: Blackwell publishers, 2005. Print.

Rice, Philip. & Patricia Waugh (eds.) *Modern Literary Theory*. London: Arnold, 2002. Print.

Storey, John. *Cultural Theory and Popular Culture An Introduction.* London and New York: Routledge, 2012. Print.

Tyson, Lois. *Critical Theory Today: A User Friendly Guide.* New York and London: Routledge, 2006. Print.

4. Teaching and learning methods:
o Chalk and talk
o Lecturing
o Power Point Presentations
o Quiz
o Assignment
o 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	infer various language-based theories.	K2
CO2	understand the Postmodern culture and texts.	K2
CO3	summarize the society-based theories and some of the psychoanalytical terms.	K2
CO4	inspect Marxist ideologies and apply them in literary texts.	K4
CO5	examine and interpret some of the gender issues.	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	2	2	2	2	2	1	1	29
CO2	3	2	3	3	3	3	2	2	2	2	2	1	1	29
CO3	3	2	3	3	3	2	2	2	2	2	2	1	1	28
CO4	3	3	3	3	3	2	3	2	3	2	2	1	1	31
CO5	3	2	3	3	3	2	3	2	2	3	2	1	1	30
Grand total of COs with PSOs and Pos														147
Mean value of COs with PSOs and POs= 147/65														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 Literary Criticism: Theory and Practice – 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 ELECTIVE – IV ENGLISH LITERATURE FOR NET AND SET
(Outcome Based Syllabus under CBCS Structure for the Students admitted from the
Academic Year 2022-2023onwards)

Class   : II M. A. English Literature   Part   : III Core Elective - 4
Semester   : IV   Hours : 90
Sub. Code   :   Credit : 4

1. Course Educational Objectives:
Upon completion of the Course the students will be able to
  ➢ give a historical and social perspective to the different ages in literature.
  ➢ illuminate the most familiar works and figures in literature.
  ➢ expose the students to Non- British Literatures.
  ➢ deal with the different literary movements and schools of literature.
  ➢ intensify the prominent concepts of literary theories.

UNIT -I ANGLO-SAXON PERIOD TO ELIZABETHAN AGE   (18 Hours)
Chaucer – William Langland – Gower – English Chaucerian's – Scottish Chaucerian's- Edmund Spenser – Miracle and Morality plays – Shakespeare's Predecessors – Elizabethan drama & prose – Metaphysical & Cavalier poets

UNIT-II JACOBEAN TO ROMANTIC AGE I   (18 Hours)
Jacobean and Caroline drama – Puritan age – John Milton – Restoration Satire – Restoration comedy – Neo-classical age – Alexander Pope – Jonathan Swift – Age of Reason – Samuel Johnson – Samuel Richardson – Laurence Sterne – Henry Fielding – Tobias Smollett – Revival of comedy – Oliver Goldsmith – Sheridan – Pre-Romantic poetry – Robert Burns – William Blake – First Generation of Romantic poets – Second Generation of Romantic poets – Romantic Essayists and Critics

UNIT - III VICTORIAN AGE TO CONTEMPORARY AGE   (18 Hours)
Tennyson – Robert Browning – Victorian novelists – George Eliot – Victorian Essayists – Matthew Arnold – Newman – Georgian poetry – Modern poetry and novel – Twentieth century novel and short stories – George Orwell – Henry James – Kipling – D. H. Lawrence – James Joyce – Virginia Woolf – Twentieth Century Drama – Samuel Beckett – Harold Pinter – Twentieth century poetry – T.S. Eliot – W.B. Yeats

UNIT - IV AMERICAN AND OTHER NON-BRITISH LITERATURES   (18 Hours)
Early American writers – Irving – Cooper – New Englanders – Thoreau – Emerson – Post-Independence American poetry – Walt Whitman – Emily Dickinson – 20th Century American literature – Canadian Literature – Australian Literature – New Zealand Literature – African Literature – Indian writing in English

UNIT - V LITERARY THEORY AND CRITICISM   (18 Hours)
The Ancients: Plato - Aristotle – Horace – Longinus, British Critics: Sir Philip Sidney to F.R. Leavis, New Criticism – Formalism – Russian Formalism – Practical Criticism - Literary Theories: From Structuralism to Eco-criticism – Cultural Studies

2. Books for Study:

Abrams, M. H. (Ed). *The Norton Anthology of English Literature*. Vol. 1, W.W. New York USA: Norton Company. 3rd Edition, 1974. Print.

Ashok, Padmaja. *The Social History of England*. Chennai: Orient BlackSwan, 2017. Print.

Barry, Peter. *Beginning Theory An Introduction to Literary and Cultural Theory*. NewDelhi: Viva Books, 2010. Print.

Long, J William. *English Literature Its History and Significance*. New Delhi: Kalyani Publishers, 2009. Print.

Prasad B. *A Background to the study of English Literature*. New Delhi: Trinity, 2016. Print.

3. Books for Reference:

Chandra, Joseph, and K. S Antony Swamy. *Classical to Contemporary Literary Theory: A Demystified Approach*. Atlantic Publishers & Distributors, 2010. Print.

Cuddon J. A and M. A. R. Habib. *The Penguin Dictionary of Literary Terms and Literary Theory.* New Delhi: Penguin Books. 2015. Print.

Daiches, David. *A Critical History of English Literature:* Vol. 1- 4. New Delhi: Supernova, 2011. Print.

Drabble, Margaret. *The Oxford Companion to English Literature*. OUP: New York, 1998. Print.

Nagarajan M.S. *English Literary Criticism and Theory*. Hyderabad: Orient BlackSwan, 2006. Print.

Krishnaswamy N, John Varghese and Sunita Mishra. *Contemporary Literary Theory:A Student's Companion*. New Delhi: Macmillan, 2012. Print.

4. Teaching and learning methods:
- Chalk and talk
- ICT usage
- Seminar
- Quiz
- Assignments
- Group discussion
- Audio book

5. Course Outcome: Upon completion of the Course the student is able to

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	identify the historical and social perspective to the different ages in literature.	K2
CO2	interpret the most familiar works and figures in literature.	K2
CO3	describe the Non- British Literatures.	K3
CO4	classify the different literary movements and schools of literature.	K4
CO5	distinguish the prominent concepts of literary theories.	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	2	2	2	3	2	2	2	2	2	2		26
CO2	2	2	2	3	2	2	2	2	2	2	2	2		25
CO3	3	2	2	2	2	2	2	2	2	2	2	2		25
CO4	2	3	2	2	2	2	2	2	2	2	2			23
CO5	2	3	2	2	2	2	3	2	2	2	2			24
Grand total of COs with PSOs and Pos														123
Mean value of COs with PSOs and POs= 123/58														2.1

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			2.1
Observation	COs of English for Literature for NET and SET – 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 ELECTIVE – IV– CONTENTWRITING
(Outcome Based Syllabus under CBCS Structure for the Students admitted
from the Academic Year 2022-2023 onwards)

Class	: II M. A. English Literature	Part : III Core Elective - 4
Semester	: IV	Hours : 90
Sub. Code	:	Credit : 4

1. Course Educational Objectives:
Upon completion of the Course the students will be able to
➢ Understand the basic concepts of Content Writing
➢ Obtain knowledge on the features of Content Writing
➢ Sensitize the various styles and techniques of writing and editing
➢ Bridge the gap existing between academia and industry
➢ Gain proficiency in content writing for a better career

UNIT – I **(18 HOURS)**
The Concept of Content Writing and its relevance - Types of Content Writing - Role and Functions of Content Writers - Print and Web Content Writing - Content Marketing - Scope and Types of Content Writing

UNIT – II **(18 HOURS)**
The Process of Content Writing: getting the brief, ideating, researching, structuring, formatting.
Editing and Proof-Reading: following company style sheet, grammar, copy flow, restructuring, market research
Writing Styles: Non-fiction (Essays, Reports), Advertising, Newspapers
Writing blogs, case studies, white papers
Online Content Writing - Blog Writing & Web Content Writing

UNIT – III **(18 HOURS)**
Infographics- Importance and relevance - Images, Screenshots - Videos, Memes, GIFs, 30 degree videos, Quizzes, Polls, Interactive white papers - Product Demonstrations - Media Content -Journalistic Writing - Feature Writing - Marketing and Advertising Copywriting

UNIT – IV **(18 HOURS)**
Basics of social media - Understanding social media content writing - Plagiarism laws in Content Writing - Content Review -Research and Report Writing Content Editing and Proof-reading Language of the Content

UNIT – V **(18 HOURS)**
Writing Practice on Contemporary Issues - Review on Expert lectures, online seminars – webinars – critical appreciation of literary works, speeches, orations & interviews

2. Books for Study:

Paul Lima, *Fundamentals of Writing: How to Write Articles, Media Releases,Case Studies, Blog Posts and Social Media Cont*ent, Ingram short title; illustrated edition,2013. Print.

Sonja Jefferson and Sharon Tanton, *Valuable Content Marketing: How to make Quality Content?*
Your Key to Success, Publisher: Kogan, 2013. Print.

3. Books for Reference:

Feldar, Lynda. *Writing for the Web: Creating Compelling Web Content Using Words, Pictures, and*
Sound. New Riders, 2011. Print.

James, Anthony. *Blog Writing: The Content Creation Blueprint*. Amazon digital services LLDKDP print US, 2018. Print.

4. Teaching and learning methods:
- o Chalk and talk
- o ICT usage
- o Seminar
- o Quiz / Tests
- o Assignments
- o Group discussion
- o Interaction

5. Course Outcome: Upon completion of the Course the student is able to

S. No.	Course Outcome	Knowledge Level (Bloom's Taxonomy)
CO1	Understand the basic concepts of Content Writing	K2
CO2	Obtain knowledge on the features of Content Writing	K2
CO3	Sensitize the various styles and techniques of Writing and Editing	K3
CO4	Bridge the gap existing between academia and industry	K4
CO5	Gain proficiency in content writing for a better career	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	2	2	2	3	2	2	2	2	2	2		26
CO2	2	2	2	3	2	2	2	2	2	2	2	2		25
CO3	3	2	2	2	2	2	2	2	2	2	2	2		25
CO4	2	3	2	2	2	2	2	2	2	2	2			23
CO5	2	3	2	2	2	2	3	2	2	2	2			24
Grand total of COs with PSOs and Pos														123
Mean value of COs with PSOs and POs= 123/58														2.1

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			2.1
Observation	COs of Content Writing – 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

PROJECT WORK

(Outcome Based Syllabus under CBCS Structure for the Students admitted from the Academic Year 2022-2023 onwards)

Class	: II M. A. English Literature	Part	: III
Semester	: IV	Hours	: 180
Sub. Code	:	Credits	: 5

Common Guidelines for the Project:

A. Guidelines for Teachers:

1. The Project/Dissertation should be done under the direct supervision of a teacher of the department. The Project Coordinator appointed by the Head of the Department shall allot the wards equally among all the faculty members of the department.

2. The teaching hours allotted in the fourth semester for the Project/Dissertation [i.e., 12 hours per week] is to make the students familiar with Research Methodology and writing the dissertation.

3. The allotment is to be done in the beginning of the IV Semester.

4. Students should select their topics in consultation with the supervisor.

5. Credit will be given to original contributions. So, students should not copy from other projects.

6. There will be an Internal Viva Voce for 50 marks and the external Viva Voce conducted for 50 marks. The Project Coordinatorwill suggest the External Examiner in consultation with the Head of the Department and will conduct both Internal and External Viva Voce. The External Examiner should be invited from other institution. All the Faculty should be present for the viva voce. The Chairman shall do the consolidation of marks after Viva Voce.

7. The Project/Dissertation must be from 25to 30 pages.

8. All the students should report the progress of their project work periodically to the supervisor. (The supervisor may collect a one-page Preface consisting of the significance of the topic, objectives and the chapter summaries for the successful completion of the project).

9. Four copies of the Project/Dissertationhave to be submitted by each student. One copy will be forwarded to the Office of the Controller of the Examinations, and the second copy is to be retained atthe department, the third copy should be submitted to the respective supervisor and the students can have the fourth copy.

B. General guidelines for the preparation of the Project/Dissertation:

1. Paper must be of A4 size only.
2. One side Laser Printing.
3. Line Spacing: double.

4. Printing Margin: 1.5 inch for left margin and 1 inch margin on the remaining three sides.
5. Font: Times New Roman only.
6. Font size: Main title -14/BOLD & inside the subject matter - 12 normal.
7. The project should be a bound only.
8. Paragraphs and line spacing: double space between lines [MLA format].
9. Double space between paragraphs. No additional space between paragraphs.
10. Start new Chapter on a new page.
11. Chapter headings (bold/centered) must be identical.

C. Sequence of pages in the Project/Dissertation:
1. Cover Page.
2. First Page.
3. Certificate (to be signed by the Head of the Department and the Supervisor).
4. Declaration (to be signed by the Head of the Department and the Supervisor Teacher and the respective student).
(items I, ii, iii and iv will be prepared by the Project Coordinator and finalized by the Chairperson of the Board (Head of the Department) and the final copy will be circulated among the students.
5. At the end of the Acknowledgement, students' name and signature should be given.
6. Contents page with details of Chapter Number, Chapter Heading & Page Numbers.
7. **Chapter divisions:** The supervisor may decide the number of chapters.

D. Arrangement of the First Chapter: The First Chapter should consistof the following:
1. Introduction of the concept or theory and its relevance to the chosen work/author and his/her works, themes of his work, awards and achievements.
2. Research Gap
3. Survey of Literature
4. Thesis Statement
4. Chapter arrangement – one paragraph explaining the content of each chapter

EVALUATION PATTERN FOR PROJECT WORK

1. Criteria for the Internal Evaluation: (50 Marks)

I. Writing Survey of Literature	: 15 Marks
II. Preparation of the Dissertation	: 25 Marks
III. Pre-Viva	: 10 Marks

	: 50 Marks
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1. External Evaluation (50 Marks)
The External Examiner may use his/her discretion to decide the Criteria and he/she may award marks accordingly.

Blue Print of the Question Paper

Course Code: Reg. No. :

SEMESTER DEGREE EXAMINATION

DEPARTMENT: History, Philosophy, Maths, RDS, FST, Tamil. Lit., Eng. Lit., Commerce, BBA, IT&M, Physical Education, Comp. Sci. & Applications

DEGREE: …………….……   **Semester III and IV (both for UG and PG)**

(For the candidates admitted during 2022-2023)
< Title of the Subject >

Time: 3 Hours   **Maximum Marks: 100**

Answer ALL the questions
SECTION – A (10 × 1 = 10 Marks) (Bloom's Taxonomy K1 / K2 Level)
(Two questions from each unit)
Choose the best answer

S. No.		Question			LevelK1 / K2
1					
	a)		b)		
	c)		d)		
2					
	a)		b)		
	c)		d)		
3					
	a)		b)		
	c)		d)		
4					
	a)		b)		
	c)		d)		
5					
	a)		b)		
	c)		d)		
6					
	a)		b)		
	c)		d)		
7					
	a)		b)		
	c)		d)		
8					
	a)		b)		

	c)		d)		
9					
	a)		b)		
	c)		d)		
10					
	a)		b)		
	c)		d)		

SECTION – B (5 × 6 = 30 Marks) (Bloom's Taxonomy K2 / K3 Level)
(Two questions from each unit)
Answer all the questions

S.No.		Questions	Unit		Level K2 / K3
11	(a)		I	(OR)	
11	(b)		I		
12	(a)		II	(OR)	
12	(b)		II		
13	(a)		III	(OR)	
13	(b)		III		
14	(a)		IV	(OR)	
14	(b)		IV		
15	(a)		V	(OR)	
15	(b)		V		

SECTION – C (5 × 12 = 60 Marks) (Bloom's Taxonomy K3 / K4 / K5 Level)
(Two questions from each unit)
Answer all the questions

S.No.		Questions	Unit		Level K3 / K4 / K5
16	(a)		I	(OR)	
16	(b)		I		
17	(a)		II	(OR)	
17	(b)		II		
18	(a)		III	(OR)	
18	(b)		III		

19	(a)		IV	**(OR)**	
19	(b)		IV		
20	(a)		V	**(OR)**	
20	(b)		V		

DEPARTMENT OF COMMERCE WITH COMPUTER APPLICATIONS

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

PG DEPARTMENT OF COMMERCE

B.COM WITH CA CBCS STRUCTURE

PART	SUBJECT CODE	PAPER	Hrs	Cr
I SEMESTER
I	22UTML11/ 22UHNL11/ 22UFNL11	Tamil/Hindi/French	06	04
II	22UENB11	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
	22UCMA11	Allied–I Business Economics	05	04
IV	22UFCE11	FC-Personality Development	01	01
	22UCSH12	Communication Skill	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
II SEMESTER
I	22UTML22/ 22UHNL22/ 22UFNL22	Tamil/Hindi/French	06	04
II	22UENB22	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
	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./ YRC/ ROTARACT/AICUF/NCB	--	01
		Total	30	24
III SEMESTER
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
IV SEMESTER				
III		Core		
	22UCMC84	Corporate Accounting I	06	05
	22UCMC94	E-Commerce-Theory	03	02
	22UCMP44	Practical	03	02
	22UCMD04	Business Management	06	04
	22UCMA44	Allied IV-Business Statistics	05	04
IV	22UCMN24	Non Major Elective to Arts Students– 1.AptitudeTechniques 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
V SEMESTER				
III		Core		
	22UCMD15	Cost Accounting	05	04
	22UCMD25	Programming With JAVA-Theory	03	03
	22UCMP55	Practical	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	22UINT15	Internship (Holidays)	-	01
	22USSI16	Soft Skills	02	--
		Total	30	25
VI SEMESTER				
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 COMMERCE

Class	: II B.Com with CA	**Part**	: III Core 5
Semester	: III	**Hours**	: 90
Subject Code	: 22UCMC53	**Credits:**	05

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1. **Title of the paper**: **PARTNERSHIP ACCOUNTS**

2. Course Objectives (CO):
   1. Explain the concepts of partnership accounts theory and practice.
   2. Enable the students the conceptual principles and develop an enterprise in handling the account in the permission of a partner.
   3. Calibrate the procedure involved in retirement and death of partners in the partnership accounts.
   4. Enable the students the procedure in handling the accounts in case of dissolution of partnership.
   5. Calibrate the procedures involved in amalgamation and sale of firm.

3. Five Units of syllabus:

UNITS	CONTENT	HOURS
I	**Partnership** : Meaning – Features – kinds- Partnership deed- Partnership Accounts - capital Account for the partners – Fixed capital method – Fluctuating Capital Method-Profit and Loss Appropriation accounts – Past adjustments – Accounting Procedures	**18**
II	**Admission of a partner**– Profit sharing Ratio – Good will - Revaluation of Assets and liabilities. Retained earnings and accumulated losses – Book values are not to be altered – (Memorandum revaluation method) Treatment of Goodwill, Adjustment	**18**
III	**Retirement and death of partners**– Ascertainment of amount due to retiring partner – Simultaneous retirement and admission – Death of a partner – Profit sharing ratio - Gaining ratio-Joint life policy – Difference between Sacrificing and Gaining ratio	**18**
IV	**Amalgamation of Firms**-Meaning and accounting procedure – Assets and liabilities not taken over - Different forms of Amalgamation of Firms - Objectives of Amalgamation of firms – Accounting treatment	**18**
V	**Dissolution of partnership**: Dissolution of firm – Dissolution by court – settlement of accounts – Gradual realization of Assets - Modes of dissolution – Treatment of goodwill on dissolution –Treatment of unrecorded assets and liabilities – Piece meal distribution-proportionate capital method – Maximum loss	**18**

	method. **Insolvency of a partner**– Insolvency of more partners than one – Insolvency of all partners – Sale of partnership Business to Company - Accounting Entries.	

4. Text Book:
1. Reddy T.S. and Murthy A. (2014) "Advanced Accountancy", Margham Publications, Chennai.

5. Reference Books:
1. Gupta, R.L and Rathaswamy, M. (2002) "Advanced Accountancy", Sultan Chand & Sons, New Delhi.
2. Jain.S.P. & Narang, K.L (2006) "Advanced Accountancy", Kalyani Publication, New Delhi.

6. Teaching Learning methods:
   PPT, Lecture, Test, Assignment

7. Course outcome:
After Completion of the Course Partnership Accounts the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Define and examine the accounting principles, underlying financial statement and their implementation in partnership firm.	K1 & K3
CO 2	Interpret the financial result after admission of a partner and explain different accounting policies.	K3
CO 3	Interpret the financial result after retirement and death of a partner and explain different accounting policies.	K3
CO 4	Develop the procedure involved in amalgamation and sale of firm in the partnership accounts.	K2,K3
CO 5	Discuss the case Garner Vs Murray and solve problems relating to insolvency of partners.	K3

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	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
Grand Total of COs with PSOs and POs														123
Mean Value of COs with PSOs and POs(123/51)														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	COs of Partnership Accounts strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II B.Com CA	Part	: III Core
Semester	: III	Hours	: 45
Subject Code	: 22UCMC63	Credits: 02	

1. **Title of the paper**: **INFORMATION TECHNOLOGY**

2. **Course Objectives (CO):**
   1. Understand the basic concepts of the Number System.
   2. To gain the strong knowledge on Computer Networks.
   3. To impart the knowledge on HTML tags.
   4. Learn the type of List and Table attributes.
   5. To enlighten the students on Frames and Forms

3. **Five Units of Syllabus:**

Unit	Content	Hours
1.	The Number System: Decimal Number System – Binary Number System – Binary Addition – Binary Subtraction – Complements – Signed and Unsigned Number Representation –Binary Coded Decimal (BCD) – Gray Code – Excess-3 Code – ASCII Code – EBCDIC Code – Bits, Bytes and Words – Octal Number System – Hexadecimal Number System	9
2.	Computer networks: Overview of a network–Communication Media– Telecommunication software - Types of networks – Network topology - Internet & world Wide Web : internet basics – internet protocols –internet addressing–worldwide web (WWW)– Web pages.	9
3.	Introduction to HTML–Anatomy of HTML document – tag attributer-title–document tags–fonts–background–heading level tags–creating paragraph and line break.	9
4.	List – Types of List – Ordered List – Unordered List - Adding Graphics to HTML Documents – Marquee tags and its Attributes – Table – Cell Spacing and Cell Padding –Row and Column span– Horizontal and Vertical tag.	9
5.	Linking Documents – Links – Image as Hyperlink – Introduction to Frames – Frameset –Forms	9

4. **Books for Study:**
   1. Alexis Leon, Mathews Leon, (2009) "Fundamentals of Information Technology", Second edition, Unit I & II, New Delhi.
   2. C. Xavier, World Wide Web Design with HTML, 2006, Tata McGraw Hill, New Delhi. (Unit III, IV, V)

5. **Books for Reference:**
   1. Raj Kumar Shrivastav, (Edition 2009 10)"A text book of Information

Technology", Wisdom Press, New Delhi.

2. BayrossIvan, (2000)" HTML, DHTML, JAVA Script", BPB Publication, New Delhi.

3. Deitel, Edition 3, 2003, Internet and World Wide Web How to program Prentice Hall.

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 Information Technology the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Convert the binary into decimal, octal and Hexadecimal	K1&K2
CO2	Categorize the types of Network protocols, topology and Communication Media	K2
CO3	Apply the basic HTML tags to design the webpage	K3
CO4	Able to design the HTML program using List, Table tags with its attributes	K3, K4
CO5	Analyze the concepts on frames and forms.	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	2	3	3	2	2	1	34
CO2	3	3	2	3	2	3	3	-	3	3	2	1	1	29
CO3	3	3	2	1	-	3	3	-	3	3	3	2	1	27
CO4	3	3	2	2	3	3	3	-	3	3	3	1	-	29
CO5	3	2	3	2	3	3	3	1	3	3	3	2	-	31
Grand Total of COs with PSOs and POs														150
Mean Value of COs with PSOs and Pos (150/59)														2.54

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			2.54
Observation	COs of Information Technology strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II B.Com CA	**Part**	: III (CORE)
Semester	: III	**Hours**	: 45
Subject Code	: 22UCMP33	**Credits**	: 2

INFORMATION TECHNOLOGY LAB

LAB EXERCISES:

1. Create a webpage with text formatting–paragraph breaks, line breaks.

2. Create a webpage in different heading style.

3. Create a text with different text styles–bold, italic, Underline.

4. Create a paragraph with different text effect–centering, spacing, font size and color.

5. Display the subjects using ordered list– Number, Alphabets, Roman Number

6. Display the subjects using unordered list.

7. Insert image and change its height, width, and border and align the image.

8. Create a table and change its width, border, cell padding cell spacing, background, color.

9. Create a webpage and make link with other webpage.

10. Create a frame set with five frames.

11. Create a college website.

12. Create an advertisement.

13. Create a computer selling company website.

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II B.Com CA	Part	: III
Semester	: III	Hours	: 90
Subject Code	: 22UCMC73	Credits	: 04

1.   **Title of the paper**: **PRACTICAL BANKING**

2.   **Course Educational Objectives:**
  1. Identify the relationship between banker and customer.
  2. To familiarize various types of cheques.
  3. To understand the duties and responsibilities of paying and collecting banker.
  4. To interpret and examine loans and advances.
  5. To enhance practical knowledge in E- banking services..

3.   **Five Units of Syllabus:**

Unit	Content	Hours
1.	Bank-Banker-Banking: Meaning-definition-Scope-Bank vs Banking-Types of banks in India-functions of Commercial banks - Relationship of banker and Customer-General relationship, Special relationship. Opening and Operations of bank accounts:- Types of Accounts–Types of Customer/Account holders.	18
2.	Cheque: Definition of Cheque - Essentials of a Cheque-Drawing of a cheque-Type of cheques-material alteration-Crossing-different forms of crossing and their significance-Loss of cheques in transit-Endorsement-Types of Endorsement and their legal effect.	18
3.	Paying and collecting Bankers: Rights, responsibilities and duties of paying and collecting bankers-Precautions to be taken in paying and collection of cheques-payment in due course, holder in due course-recovery of money paid by mistake.	18
4.	Loans and advances: principles of lending-Types of Lending-Over drafts, cash credit, Demand Draft, Lending against life policies-Documents to title to goods-Lien, pledge, Hypothecation, Mortgage and assignment.	18
5.	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	18

4. Text Book:
  1. Gordon E. and Natarajan. (K.2015), "Banking Theory Law and Practice", Himalaya Publishing House, Mumbai.

5. Reference Book:

1. Varshney.P.N. (2014)" Banking Law and Practice", Sultan Chand & Sons,New Delhi.

6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion

7. Course Outcome (CO)

After Completion of the Course Practical Banking the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Understand the concept of banking, functions, the relationship of banker with the customer	K2
CO2	Know the procedural formalities in dealing with different kinds of Cheque, Crossing, alterations and Endorsement	K1
CO3	Develop a perfect theoretical knowledge on Paying and collecting Bankers, their duties and responsibilities, payment in due course, Holder in due course	K3
CO4	Differentiate the documents of title to goods	K3,K4
CO5	Learn electronic fund transfer system.	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
Grand Total of COs with PSOs and POs														137
Mean Value of COs with PSOs and POs (137/58)														2.36

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			2.36
Observation	COs of Practical Banking strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENTOF COMMERCE

Class	**: II B.Com CA**	**Part**	**: III (Allied-3)**
Semester	**: III**	**Hours**	**: 75**
Subject Code : 22UCMA33		**Credits: 04**	

1.Title of the Paper: BUSINESS MATHEMATICS

2. Course Objectives (CO):
1. To understand the concept of Interest calculation
2. To enlighten the students in the basics of sets.
3. To demonstrate the concept of permutation and combination
4. To understand the concept of indices.
5. To impart the knowledge of Central Tendency

3. Five Units of syllabus:

Unit	Content	Hours
1.	Commercial Arithmetic: Percentage- simple and Compound Interest-true and Bankers discount.	15
2.	Theory of sets: Elements of set-Types of sets-Venndiagrams-union of sets, Complements and intersection-Demargon's law.	15
3.	Permutation and combinations: Rules – Fractional notation- Circular permutations -Complementary theorems-restricted combinations.	15
4.	Indices- positive indices- fractional indices-operations with power functions - logarithms-laws and operations-change of base (simple problems only).	15
5.	Arithmetic and Geometric progressions: Arithmetic progressions-sum of series in Arithmetic Mean–Geometric progressions-sum of series in geometric Mean.	15

4. Book for Study
1. Manoharan.M & Elango.C, (2010), "Business Mathematics", Palani Paramount Publication, Palani.

5. Books for Reference:
1. M.Wilson, (2011),"Business Mathematics", Himalaya Publication House, Mumbai.
2. Peer Mohamed & ShazuliIbrahim, (2008), "Business Mathematics", Pass Publication, Madurai.

6. Teaching Learning methods:
PPT, Lecture, Test, Assignment

7. Course Outcome (CO):

After Completion of the Course Business Mathematics the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Familiarize the students with the Basic Mathematical Concepts for their higher studies	K1&K2
CO 2	Computing the problems in different sets	K2
CO 3	Interpret the problems of permutation and combination	K3
CO 4	Understand of different methods of Indices.	K3
CO 5	Apply central tendency treatments in their life	K2

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	2	3	29
CO2	3	3	2	3	3	3	2	3	-	-	2	2	1	27
CO3	3	3	2	2	-	3	3	-	3	3	-	1	-	23
CO4	3	3	3	3	3	3	2	2	-	-	3	1	2	28
CO5	3	2	-	2	3	3	2	2	3	1	3	-	3	27
Grand Total of COs with PSOs and POs														**134**
Mean Value of COs with PSOs and POs (134/56)														**2.52**

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			2.52
Observation	COs of Business Mathematics strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II B.Com CA	**Part**	: IV (NME-1)
Semester	: III	**Hours**	: 45
Subject Code	: 22UCMN13	**Credits:**	02

1.Title of the Paper: PRINCIPLES OF ACCOUNTANCY

2.Course Objectives:

1. Understand the basic concepts of Accounting and convention.
2. Prepare ledger accounts using double entry book keeping.
3. Classify the cash book.
4. Prepare Trial Balance.
5. Preparation of final accounts of a sole trader.

3.Five Units of Syllabus:

Unit	Content	Hours
1.	Accounting-Meaning, objectives, advantages, accounting concepts and conventions.	**9**
2.	Books of accounts-Journal, Ledger, Preparation of Subsidiary Books –sales books-purchases book-sales return books-purchases return-bills payable –bills receivables.	**9**
3.	Cash Book: Single Column, Double Column and Triple Column.	**9**
4.	Preparation of Trial Balance	**9**
5.	Preparation of Final accounts and Balance sheet with simple adjustments.	**9**

3. Books for Study:

1. Grewal.T.S. (2006),"Introduction to Accountancy", Chand & Co., New Delhi.

4. Books for References:

1. Gupta, R.L, (2008),"Advance Accounts Vol-1", Sulthan Chand & Sons., New Delhi.
2. Jain & Narang, (2007), "Advance Accountancy-Vol-1", Kalyani Publication, New Delhi.

5. Teaching Learning methods:

PPT, Lecture, Test, Assignment

6. Course Outcome (CO):

After Completion of the Course Principles of Accountancy the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Acquire the conceptual knowledge of accounting concepts and Convention	K1&K2
CO2	Grasp the accounting treatments relating to posting of double Entry system properly.	K2
CO3	Classify the cashbook	K3

CO4	Interpret the financial report after preparing ledger and posting balance in trial balance	K2
CO5	Develop the skills in preparation of final accounts pertaining to sole proprietorship.	K3

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	2	3	3	3	3	2	2	1	1	-	2	28
CO2	3	3	2	-	3	3	3	2	3	1	1	-	1	25
CO3	3	3	3	3	3	3	3	3	-	2	2	2	-	30
CO4	3	3	2	-	2	3	3	2	2	2	-	-	1	23
CO5	3	3	3	3	3	3	3	2	2	1	-	1	1	28
Grand Total of COs with PSOs and POs														134
Mean Value of COs with PSOs and POs (134/56)														2.39

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			2.39
Observation	COs of Principles of Accountancy strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514
DEPARTMENT OF COMMERCE

Class	: II B.Com CA	**Part**	: IV (SBE)
Semester	: III	**Hours**	: 45
Subject Code	: 22UCMS13	**Credits: 02**	

1. Title of the Paper: BUSINESS COMMUNICATION

2. Course Objectives (CO)

At the end of the course, students will be able to

i. Identify various structures of a business letter and the occasions for drafting letters such as an enquiry about the product, provide an offer, order and status enquiries.

ii. Paraphrase sales letters, collection letters and reminders, complaints, claims and adjustments.

iii. Appraise applications for situation vacant.

iv. Diagnose different Modern Communication methods.

v. Develop speaking skills.

3.Five units of Syllabus

UNITS	CONTENT	HOURS
I	IntroductiontoBusinessCommunication:EssentialsofCommunication–Types–Barriers -Importance-Structure of Business Letters-Drafting of Different Types of Business Letters –Letter of Enquiry–Offers and Quotations–Orders–Trade References and Status Enquiries.	9
II	Business Letter: Complaints- Claims–Adjustments–Refusals–Sales Letters–Agency Letters–Collection letters-Banking Letters–Insurance Letters–Circular Letters	9
III	Application Letters and Memos: Letters Calling Candidates for Written Test - Drafting Interview Letters - Offer of Appointment-Provisional Appointment Orders- Final Order of Appointment-Employee Disciplinary Matters-Show Cause Notices-Charge Sheets-Letters of Dismissal and Discharge	9
IV	Electronic Communication: Internet-Tele-Conferencing-Word Processing - Desktop Publishing - Electronic Mail (E-Mail) - Audio Conferencing-Video Conferencing-Webinars-Data storage and retrieval	9
V	Spoken skills: Conducting Presentation, Oral presentation, Debates, Speeches, Interview, Group Discussion, English Pronunciation, Building Vocabulary	9

4. Text Book:

1. Rajendrapal & Kohrahalli, Essentials of business communication S.Chand Publications, New Delhi, 2011.

5.Reference Book:

1. Sharma R.O & Krishna Mohan: Business Communication & Report Writing, Tata Mcgraw Hill, New Delhi, 2017.

2. Raman S &Swami R, Business Communication A Practical Approach, Professional Publications, Chennai, 2015.

3. Asha Kaul, Business Communication, Prentice Hall India Learning Private Limited, New Delhi, 2009.

6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion

7. Course Outcome (CO)

After Completion of the Course Business Communication the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Understand the concept of business communication	K2
CO2	Getting a practical exposure in writing different types of letters	K1
CO3	Identify the different kinds of employment communication	K3
CO4	Understand the uses of electronic communication	K3,K4
CO5	Develop a perfect practical knowledge on presentation	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
Grand Total of COs with PSOs and POs														137
Mean Value of COs with PSOs and POs(137/58)														2.36

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			2.36
Observation	COs of Business Communication strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II B.Com CA	Part : III Core 8
Semester	: IV	Hours : 90
Subject Code	: 22UCMC84	Credits: 05

1. Title of the paper: CORPORATE ACCOUNTING I

2. Course Objectives:

1. To train the students in the basics of issue and redemption of shares
2. To enlighten the students on the application of issue and redemption of debentures.
3. To impart the knowledge of companies profit prior to incorporation and under writing.
4. To understand the concept of valuation of shares and good will.
5. To demonstrate the concept of adjustments to be made in the final accounts of joint stocks companies

3. Five Units of syllabus:

Unit	Content	Hours
1.	Company Accounts – share capital – issue of shares for cash – – issue of shares other than cash -Application – Allotment Calls – Calls in Advance calls in arrear –Issue of shares at par, at premium - Issue of shares at discount-Forfeiture of shares - Reissue of forfeited shares – Forfeiture of shares when the reisan over subscription and pro-rata allotment–Rights issues. Redeemable preference shares–Issue and Redemption.	15
2.	Debentures – Issue of debentures – debenture discount and its treatment–Interest on debentures– provision for Redemption of debentures – Sinking fund method – Non-cumulative sinking fund – Insurance policy method –own debentures-Interest on own debentures–Ex-Interest and Cum Interest.	20
3.	Profits prior to incorporation—Time ratio & Sales ratio--Underwriting–liability of under writer–total and partial under writing–Firm under writing.-under writing commission.	20
4.	Valuation of good will – Methods of valuing Good will (average profit method, super profit method, capitalization method) - Valuation of equity and preference shares (net assets method, yield value ,fair value method)	15
5.	Final Accounts of companies–contents of Final statements–Vertical form of balance sheet (new format)–divisible profits and dividends–Transfer of profit store serve computation of maximum amount of dividend payable–guidelines for issue of bonus shares.	20

4. Book for Study

1. Reddy.T.S & Murthy.A. (2014),"Corporate Accounting", Margham Publications, Chennai.

5. Books for Reference:

1. Advanced Accounting: Corporate Accounting, Ashok Sehgal & Deepak Sehgal, Taxmann, 2017

2. Corporate Accounting, B.S.Raman, United Publishers, 2017
3. Advanced Accounting, S.P.Jain & K.L.Narang, Kalyani Publishers, 2017
4. Advanced Accounting, Dr. Arulanandham & Raman, Himalaya Publishing House Pvt ltd, 2017
5. Hanif and Mukherjee. (2004), "Modern Accountancy", Tata McGraw Hill Publishing Company Ltd, New Delhi.
6. Shukla M.C., Grewal T.S (2004), "Advanced Accountancy", Sultan Chand & Company Ltd, New Delhi.

5. Teaching Learning methods:

PPT, Lecture, Test, Assignment

6. Course Outcome (CO):

CO No.	Statement	Level
CO1	Familiarise the students with the Basic knowledge in issue and Redemption of shares.	K1&K2
CO2	Classify and understand the issue and redemption of debentures.	K2
CO3	Prepare problems of profit prior to incorporation and underwriting	K3
CO4	Understand the valuation of shares and goodwill	K3
CO5	Interpret the problems of final accounts of joint stock companies	K2

7. 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 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	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	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.45
Observation	COs of Corporate Accounting I strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II B.Com CA	Part	: III Core-9
Semester	: IV	Hours : 45	
Subject Code	: 22UCMC94	Credit: 02	

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1. **Title of the Paper: E-COMMERCE**

2. **Course Objectives (CO)**
   - In-depth understanding of traditional commerce and e-commerce.
   - Impart the knowledge of applications of ecommerce.
   - They can understand the importance of EDI, E-CR Mine-commerce.
   - To know the concept of e-payment methods.
   - Develop a perfect understanding on mobile commerce technology.

3. **Five units of the Syllabus:**

Unit	Content	Hours
I	Introduction–Definition of Electronic Commerce–Electronic Commerce and Traditional Commerce-Advantages of Electronic Commerce to Business, Consumers, Society, Nation –Factors stressing the need for Electronic Business–Classification of Electronic Commerce: Business 2 Business, Business 2 Consumer, Consumer 2 Consumer, Consumer 2 Business, Business 2 Employer, Business 2 Government.	9
II	Framework and Applications: Anatomy of Electronic Commerce Applications – Electronic Commerce Applications: Employment–Real Estate– Healthcare–Insurance–Planning and Essentials of E-Commerce: Planning process–E-Business Strategies–Essentials of E-Commerce.	9
III	Electronic Data Interchange: Process–Benefits– EDI standards -E-Marketing and E-Advertising: – E-Marketing – Advantages – Segmentation–E-Marketing mix-E-Advertising–Format for Web advertising–E-CRM–Advantages –E-CRM work model	9
IV	E-Payment: Benefits –Components of E-Payment–EDI–Credit card system – Popular Electronic Payment Methods – Security requirements in E-Payment Systems – Online transaction Protocols–E-Security: Security threats –E-Security Protection –Cryptography based protection.	9
V	Mobile Commerce: Introduction–Difference between Electronic Commerce and Mobile Commerce-Growth of Mobile Commerce in India–Advantages of Mobile Commerce–Technologies behind Mobile Commerce–Applications of Mobile Commerce–Types of Mobile Payment.	9

4. Books for Study:

1.Abirami Devi.K, Alagammai.M, 2019, "E-Commerce", Margham Publications, Chennai.

5. Books for Reference:

1. P.T.Joseph, S.J. (2011)," E-Commerce", An Indian Perspective PHI Learning, Fourth Edition, New Delhi.

2. Kenneth C.Laudon, Carol Guerico Traver, (2008),"E-Commerce Business Technology Society", Pearson Prentice Hall, New Jersey.

3. Schneider.G.P. (2015),"E-Commerce", Thomson Publication, 11thEdition, Canada.

6. Teaching Learning Methods:

Power Point Presentation, Group Discussion, Quiz, Assignments, etc….

7. Course Outcome (CO):

After Completion of the Course E-Commerce the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Compare the traditional commerce vs E –Commerce and classify Business models	K3
CO2	Discuss the applications of e-commerce	K1
CO3	Compare the EDI, E-Marketing, E-CRM	K2
CO4	Analyze the payments methods and identify these curity issues	K4
CO5	Able to handlee-commerce technology through mobile phone	K5

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
Grand Total of COs with PSOs and POs														157
Mean Value of COs with PSOs and POs(157/59)														2.66

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 E-Commerce strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II B.COM		**Part**	: III (CORE)
Semester	: IV		**Hours**	: 45
Subject Code	: 22UCMP44		**Credits**	: 2

E-COMMERCE LAB

LAB EXERCISES:

1. Email Id creation ie.Yahoo, Gmail, Bharath students.com

2. File Attachments ie.Text, Image, Pdf, Jpg

3. Downloading files ie.Pdf files

4. Online shopping

5. Online Mobile, DTH Recharge

6. Online Ticket Reservation–Bus, Air, Train.

7. Online Application–TNPSC, Naukri, Monster.

8. Online Banking(Net Banking, Mobile Banking)

9. Payment mode ie.Debit Card ,Credit Card system

10. Online views

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF COMMERCE

Class	: II B.Com CA	**Part**	: III Core-7
Semester	: IV	**Hours**	: 90
Subject Code	: 22UCMD04	**Credits:**	04

1.Title of the Paper: BUSINESS MANAGEMENT

2.Course Objectives(CO):

1. Understand the basic concepts of Management and to study the contribution of management expert.
2. Preparation of Planning and its process.
3. Understand the organization structure.
4. Grasp the knowledge of staffing.
5. Describe the controlling process and its techniques.

3.Five Units of Syllabus:

UNITS	CONTENT	HOURS
I	Management: Meaning, Characteristics and Functions – Levels of Management, Different Approaches to the study of Management–Contributions of Henri Fayol, F.W.Taylor and Peter F.Drucker–Management By Objectives (MBO).	**18**
II	Planning and organizing: Meaning-Features-Importance–Objectives – Process of Planning –Forecasting - Obstacles to Planning – Decision making – Meaning, process and types	**18**
III	Organizing: Meaning & definition-Nature and importance-features-Types of organization-Span of control-Authority and responsibility-Organization charts	**18**
IV	Staffing & Selection: Staffing-Definition-Elements – Functions-Process of Staffing-Promotion: Meaning-Basics of promotion–Qualities of Good promotion policy.	**18**
V	Controlling: Meaning & Definition–scope of controlling-Characteristics–Functions-Control Process–Important Control Techniques.	**18**

4.Books for study:

1. Ramasamy.T.(2013),"Principles of Management", Himalaya Publishing House, Mumbai.

5.Books for References:

1. Peter F. Drucker.(1988), "Practice of Management", Allied Publishers Pvt. Ltd, New Delhi.
2. L.M.Prasad (2009),"Principles and Practice of Management", Sultan Chand and Sons, New Delhi.

6. Teaching Learning methods:

PPT, Lecture, Test, Assignment

7. Course Outcome(CO):

After Completion of the Course Business Management the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Identify the basic principles and functions of management in functional are as of business and understand the contributions of experts to management thought.	K1&K2
CO2	Develop the skills in preparation of planning and its process.	K2
CO3	Learn to organize the work.	K2&K3
CO4	Understand the process of staffing.	K2&K3
CO5	Define and describe the elements & process of co-ordination and control function that contributes to the achievement of organizational objectives.	K2&K3

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	2	3	3	3	3	2	2	1	1	-	2	28
CO2	3	3	2	-	3	3	3	2	3	1	1	-	1	25
CO3	3	3	3	3	3	3	3	3	-	2	2	2	-	30
CO4	3	3	2	-	2	3	3	2	2	2	-	-	1	23
CO5	3	3	3	3	3	3	3	2	2	1	-	1	1	28
Grand Total of COs with PSOs and POs														134
Mean Value of COs with PSOs and POs (134/56)														2.39

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			2.39
Observation	COs of Business Management strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class   : II B.Com CA   Part   : III Allied-4
Semester   : IV   Hours : 75
Subject Code : 19UCMA44   Credits: 4

1. **Title of the paper**: Business Statistics
2. **Course Objectives (CEO):**
   - In-depth understanding of characteristics and functions of statistics. To know more about data collection.
   - To provide practical exposure on calculation of measure of central tendency of different series.
   - To judge the reliability of measures of central tendency
   - To provide practical knowledge on types of correlation and enable the students to analyze regression equations.
   - Develop a perfect Understanding on Calculation of various time series and trend analysis.

3. **Five Units of Syllabus:**

Unit	Content	Hours
1.	**Statistics**: Meaning – Scope - Characteristics and Limitations -Data - Sources Of Data - Methods of collection of data - Classification, Tabulation and Presentation of data - Statistical Series - Discrete and Continuous - Formulation of Frequency Distribution.	15
2.	**Measures of Central Tendency**: Meaning – Definition - Arithmetic Mean – Weighted Average - Median - Mode - Geometric Mean - Harmonic Mean.	15
3.	**Measures of Dispersion**: Meaning – Definition – Methods of measuring Dispersion – Range – Quartile Deviation – Mean Deviation – Standard Deviation.	15
4.	**Correlation and Regression** :Meaning - Types of Correlation- Scatter diagram - Pearson's Coefficient of correlation - Rank correlation (Direct Mean Method only) **Regression**: Meaning - Types of regression - Methods of Regression Analysis – Regression line – Regression Equation.	15
5.	**Index numbers**: Meaning - Types of index number – method of constructing index numbers **Analysis of Time series**: Meaning and components of time series - Methods of Trend analysis - Semi Averages - Moving Averages.	15

(Question paper consists of 20% Theory and 80% problem)

4. Books for Study:
   1. Gupta S.P, (2012),"Statistical Methods", Sultan Chand & Sons, New Delhi.
5. Books for Reference :
   1. Pillai R. S.N & Bagavthy, (2012)," Statistics Theory and Practice", Sultan Chand & Sons, New Delhi.
   2. Alagar.K., (2014),"Business Statistics", McGraw Hill Education Pvt. Ltd, New Delhi.

6. Teaching Learning Methods:
    Power Point Presentation, Group Discussion, Quiz, Assignments, etc....

7. Course Outcome (CO):
    After Completion of the Course Business Statistics the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Familiarize the concept of statistics and data collection	K2
CO 2	Strong knowledge on mean, median, mode and frequency distribution	K1
CO 3	Understand the difference between these measurements of dispersion.	K2
CO 4	Evaluate the regression equations using algebraic and mean method	K5
CO 5	Compare types of time series and determine the trend	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	2	3	29
CO2	3	3	2	3	3	3	2	3	-	-	2	2	1	27
CO3	3	3	2	2	-	3	3	-	3	3	-	1	-	23
CO4	3	3	3	3	3	3	2	2	-	-	3	1	2	28
CO5	3	2	-	2	3	3	2	2	3	1	3	-	3	27
Grand Total of COs with PSOs and POs														**134**
Mean Value of COs with PSOs and POs(134/56)														**2.52**

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			2.52
Observation	COs of Business Statistics strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II.B.B.A, B.A, B.Sc (IT&M)	Part	: IV NME-2
Semester	: IV	Hours	: 45
Subject Code	: 22UCMN24	Credits: 02	

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1. Title of the paper : APTITUDE TECHNIQUES FOR COMPETITIVE EXAMS

2. Course Objectives (CO):
1. Understand relevance &need of quantitative methods form a king business decision
2. To enlighten the students on the application of mathematical principles.
3. To impart knowledge about ratio and proportion
4. To understand the concept of Interest calculation
5. To demonstrate the problem on Permutation and Combination

3.Five Units of syllabus:

Unit	Content	Hours
I	Simplification–Average – Surds & indices	9
II	Percentage-Profit & Loss	9
III	Time & Work-Time & Distance	9
IV	Simple Interest- Compound Interest	9
V	Permutation and Combination–Data Interpretation	9

4. Book for Study
1. Agrawal R.S.(2015)," Quantitative Aptitude, S.chand Publishing", New Delhi.

5. Books for Reference:
1. Shambhu NathJha & RPH Editorial Board.(2015), "R.Gupta's Quantitative Aptitude, Ramesh Publishing House, New Delhi.

6. Teaching Learning methods:
    PPT, Lecture, Test, Assignment

7. Course Outcome (CO):

After Completion of the Course Aptitude Technique for Competitive Exam the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Familiarise the students with the Basic Mathematical concepts for to attend competitive exam	K1&K2
CO2	Apply the knowledge of percentage in their regular life	K2
CO3	Interpret the problems of ratio and proportion	K3
CO4	Find simple and compound interest and rates of interest	K3
CO5	Able to apply quantitative methods to solve a variety of business problems	K2

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	1	1	-	25
CO2	2	3	3	3	2	3	3	2	2	1	-	-	1	25
CO3	3	2	2	2	3	3	3	2	2	3	2	1	1	29
CO4	3	2	2	-	1	3	3	1	2	2	1	1	2	23
CO5	3	3	1	2	2	3	3	-	1	2	2	2	2	26
Grand Total of COs with PSOs and POs														128
Mean Value of COs with PSOs and POs (128/60)														2.13

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			2.13
Observation	COs of Aptitude Technique for Competitive Exam strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: **II B.Com with CA**	Part	: **II**
Semester	: **IV**	Hours	: **45**
Subject Code	: **22UCMS24**	Credits:	**02**

1.Title of the paper: **ENTREPRENEURSHIP DEVELOPMENT.**

2. Course Objectives (CO):

Understand the concept of Entrepreneur and their functions and importance.

1. Gain a comprehensive knowledge on entrepreneurial competencies and skills and understand the entrepreneurial growth and the factors affecting the growth.
2. Identify the entrepreneurial development programs and the opportunities for entrepreneurial career.
3. Reveal the project preparation and understand about the venture capital and export finance.
4. They can understand the different kinds of institution which supports entrepreneurs.

3.Five Units of Syllabus:

Unit	Content	Hours
1.	Entrepreneur: concept, Meaning- Characteristics – Function – Importance-Kinds of Entrepreneurs-Women entrepreneur-Factors influencing women entrepreneur- Women entrepreneurs in India	9
2.	Entrepreneurship: Meaning – Growth of Entrepreneurship in India, Factors affecting-Entrepreneurial-growth Motivation for Entrepreneurs in India. Entrepreneurial competencies and skill.	9
3.	Entrepreneurship Development Programs: objectives of EDP, Different Phases of EDP –EDP Organization. Small Enterprise: Definitions, objectives, scope, Opportunities for Entrepreneurial career- Problems of SSI.	9
4.	Project Preparation: Project identification – Project formulations and project appraisal-Venture capital-export finance.	9
5.	Institutional support to Entrepreneurs: Commercial Banks –Industrial development Bank of India, Industrial finance corporation of India, Small industries development bank of India, State finance corporation, Export import bank of India,. National small industries corporation, Small Industries development corporation, Small industries service unit, District industries centres, industrial Estate, and Technical Consultancy Organization.	9

4. Text Book:

1. Khanka S.S- Entrepreneurial Development 2012, S.Chand, New Delhi.

5. Reference Book:

1. Guptha C.B, R. Srinivasan - Entrepreneurial Development, 2008, Chand, 2011, New Delhi.

6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion.

7. Course Outcome (CO):

After Completion of the Course Entrepreneurship Development the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	To understand the basic knowledge and concept of entrepreneur	K1
CO 2	To impart the knowledge on growth and competencies.	K2
CO 3	To understand various programs related to entrepreneur	K3
CO 4	Preparation projects ad report	K4
CO 5	Know the financial support for entrepreneur.	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	2	3	3	3	1	2	1	1	1	-	2	25
CO2	3	3	2	-	3	3	3	2	3	1	1	-	1	25
CO3	3	3	3	3	3	3	3	3	-	2	2	2	-	30
CO4	3	3	2	-	2	3	3	2	2	2	-	-	1	23
CO5	3	3	3	3	3	3	3	2	2	1	-	1	1	28
Grand Total of COs with PSOs and POs														131
Mean Value of COs with PSOs and POs (131/56)														2.33

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 Entrepreneurship Development strongly related with PSOs and POs		

DEPARTMENT OF COMMERCE

Class	: II-B.Com CA	Part	: S.L.C.
Semester	: III	Hours	:
Subject Code	: 22UCMSL3	Credits	: 03

1. Title of the Paper: BUSINESS ORGANISATION

2. Course Objectives (CO)

To facilitate the learners:

1. Understand the concept of organization and their functions and importance.
2. Gaina comprehensive knowledge on New Business and Plant layout.
3. Identify the forms of Business
4. Learn the Business combination and its types
5. They can understand the term Business Finance and Stock exchange

UNITS	CONTENT	HOURS
I	**Unit I** Business Organisation :Meaning and definition of business essentials& scope of business Classification of Business Activities, Meaning, Definition, Characteristics and objectives of Business Organisation, Evolution of Business Organisation. Modern Business, Business &Profession.	
II	**Unit II** Business Unit: Establishing a new business unit. Meaning of Promotion. Features for business, Plant location, Plant Layout & size of business unit.	
III	**Unit III** Forms of Business Organisation: Sole Proprietorship, Partnership, Joint Stock Companies & Co-operatives.	
IV	**Unit IV** Business Combination: Meaning Causes, Objectives, Types and Forms Mergers, Take overs and Acquisitions.	
V	**Unit V** Business Finance: Financial need of Business methods & sources of finance. Security Market, Money Market, Study of Stock Exchange &SEBI.	

4. Text Book:

Y.K.Bhushan, Fundamentals of Business Organisation and Management, Sultan Chand & Sons, New Delhi.

5. Reference Book:

1. Chhabra T.N.; Business Organisation & Management, Sun India Publications,New Delhi.

2. Shankar, Gauri; Modern Business Organisation, Mahavir Book Depot, New Delhi.

6. Teaching Learning methods:
　　PPT, Lecture, Test, Assignment

7. Course Outcome (CO):
After Completion of the Course Business Organisation the students will be

CONo.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Familiarise the students with the Basic Business organization concepts.	K1&K2
CO2	Apply the knowledge of New Business strategies	K2
CO3	Choose different forms of Organisation	K3
CO4	Recommend Business Combination	K5
CO5	Select Business Finance and Sources	K5

　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	2	2	2	-	-	2	27
CO3	3	3	3	2	3	3	3	2	2	3	2	2	2	33
CO4	3	3	3	-	1	3	3	2	2	2	1	1	2	26
CO5	3	3	2	2	2	3	3	-	1	2	2	2	2	27
Grand Total of COs with PSOs and POs														140
Mean Value of COs with PSOs and POs (140/60)														2.33

Strong-3, Medium-2, Low-1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.33
Observation	**COs of Business Organisation strongly related with PSOs and Pos**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF BUSINESS ADMINISTRATION

Class	: II B.Com	**Part**	: SLC
Semester	: IV	**Hours**	:
Subject Code	: 22UCMSL4	**Credit**	: 3

1. Title of the Paper: OFFICE MANAGEMENT

2. Course Objectives (CO):

To facilitate the learners:

1. Understand the concept of Office Management and their functions and importance.
2. Gain a comprehensive knowledge on office accommodation.
3. Identify the Office services.
4. Learn the Office Machines and its types
5. They can understand the different procedure of recruitment.

3. Five units of Syllabus:

UNITS	CONTENT	HOURS
I	Concept of office management - Importance of office – Functions of modern office – The office manager and his job- Office organization – Meaning - Principle of office organization - Technique of organization – Types of office organization - Organization chart.	
II	Office accommodation and layout: Objectives - Principles of office layout - Steps in designing office layout - Types of layout office environment - Physical hazards in office safety – Security - Secrecy.	
III	Office services: Centralization: Decentralization of office services - Handling mail - Postal services - Office inter communication - Choice of the method of communication - Barriers of communication - Maintenance of records - Filing -Methods of filing - Centralized vs. Decentralized filing – Indexing – Types - Filing routine	
IV	Office machines: Meaning - Objectives of using machines – Advantages -Principles of office machine and equipment selection, Types of office machines - Office report-kinds of reports - Preparation of reports - Specimen of report	
V	Personnel management: Definition - Functions of personnel management department - Job analysis - Job evaluation – Recruitment - Selection of personnel-Training - Merit rating - Promotion and transfer - Office discipline- Personnel turnover- Compensation – Motivation - Employees participation in management - Staff unions.	

4. Text Book:

1. OFFICE MANAGEMENT - V.G.Mankar MacMillan India, Chennai, 1999.

5. Reference Books:

1. OFFICE MANAGEMENT – MadonKorshedVikas Publications, New Delhi, 2001.

2. OFFICE MANAGEMENT – GhoshPrasanta, Denyer J.C., Singh B.P.

6. Teaching Learning methods:
     PPT, Lecture, Test, Assignment

7. Course Outcome (CO):

After Completion of the Course Office Management the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Familiarise the students with the Basic Office Management concepts.	K1 & K2
CO 2	Apply the knowledge of environment in their regular life	K2
CO 3	Apply the practical knowledge of office work	K3
CO 4	Classify the machines	K4
CO 5	Evaluate Training and Recruitment	K5

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	2	2	2	-	-	2	27
CO3	3	2	2	2	3	3	3	2	2	3	2	2	2	31
CO4	3	2	2	-	1	3	3	2	2	2	1	1	2	24
CO5	3	3	1	2	2	3	3	-	1	2	2	2	2	26
Grand Total of COs with PSOs and POs														135
Mean Value of COs with PSOs and POs(135/60)														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	COs of Office Management strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

(for students admitted from the Academic Year 2023-2024 onwards under the CBCS pattern)

Class	: I UG		Part	: Value Added Course
Semester	:		Hours	:
Sub. Code	:		Credit	:

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1. **Title of the paper**: BUSINESS CORRESPONDENCE

2. Objectives:
  ➢ To enable the learners to learn the basic writing skills
  ➢ Understand the concept of correspondence in English and its usage.
  ➢ Know about different kinds of letter writing.
  ➢ To train learners to use the language with confidence and without committing errors.
  ➢ To enable the students to write a good letter.

Unit – I
Commercial correspondence –meaning –importance-effective correspondence

Unit - II
 Tenses - Present Tense, Past Tense, and Future Tense and commercial jargons

Unit – III
Business letter-layout –forms of business letter-qualities of a business letter

Unit - IV
Corresponding with Agency-Government**.**

Unit – V
 Resume writing-import Trade correspondence-insurance correspondence

Books for Study:
RSN Pillai and Bagavathi, Modern Commercial correspondence, S. Chand & Company ltd., New Delhi, 2007.

Book for Reference:
RC Sharma, Krishnamohan, Virendra Singh nirban, business Correspondence and Report writing, 6[th]edition,Tata mc Graw hill New Delhi 2020.

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514
DEPARTMENT OF COMMERCE
OBE –CBCS Pattern (From 2021-2022 Onwards) M.Com

Part	Nature of the paper	Subject Code	Paper	Hours	Credit
			I Semester		
III	Core	22PCMC11	Business Environment	06	05
		22PCMC21	Direct Taxes Academic Year: 2022-2023–(I SEMESTER)	06	05
		22PCMC31	Advanced Cost Accounting	06	05
		22PCMC41	Corporate legal framework	06	05
	Core Elective	22PCME11	Marketing Management	06	04
				30	**24**
			II Semester		
III	Core	22PCMC52	Advanced Business Statistics	06	05
		22PCMC62	Indirect Taxation	06	05
		22PCMC72	Accounting for Decision Making	06	05
	Core Elective	22PCME22	Managerial Economics	06	04
	NME	22PCMN12	Services Marketing	04	04
		22PLFS12	Life Skills	2+**2***	02
	Extra Credit-1		MOOC/SWAYAM		02
				30	**25 +2****
			III Semester		
III	Core	22PCMC83	Industrial law & Labour welfare	06	05
		22PCMC93	Financial Management	06	05
		22PCMD03	Operations Research	06	05
		22PCMD13	Export and Import Management	06	05
	Core Elective	22PCME33	Research Methodology	06	04
	Extra Credit-2		MOOC/SWAYAM		02
				30	**24 +2****
			IV Semester		
	Core	22PCMD24	Advanced Corporate Accounting	06	05
		22PCMD34	Advanced Human Resource Management	06	05

III	Core Elective	22PCME44	Competitive Exam for Commerce	06	04
		22PCMD44	Project	12	05
				30	**19**

Total Credits

Semester	I	II	III	IV	Total	Extra credit
Credit	**24**	**25**	**24**	**19**	**92**	**4****

Non-MajorElective: **Services Marketing**

*Represents practical outside the class hour

**Extra credit Course

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENTOF COMMERCE

PROGRAMME SPECIFIC OUTCOMES (PSO)

After the completion of PG programme, student will be able to

1) Develop skills in the preparation of Accounting statements, Income tax system, organizational dynamics, marketing practices in service sector, ethical issues and good governance practices.
2) Work in different domains like Accounting, Taxation, HRM, Banking and Administration, PVT and Public companies.
3) Establish the spirit of critical thinking on subject matter of Commerce to appear NET/SET examination.
4) Apply the most appropriate methodology in the field of Social Sciences and business.
5) Acquire inter personal and communication skills through projects, field visit and Institutional training.

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II M.Com	**Part**	: Core
Semester	: III	**Hours**	: 90
Subject Code	: 22PCMC83	**Credits**	: 05

1. **Title of the Paper: INDUSTRIAL LAW AND LABOUR WELFARE**

2. **Course Educational Objectives (CEO):**
To facilitate the learners:
   1. Acquainting the students with basics relating Industrial Jurisprudence and also Labour Policy in India.
   2. Providing an elementary understanding of the concept of Industrial Peace and Labour Harmony as well as understanding of everyday application of labour laws.
   3. Providing extensive knowledge regarding the basis of Industrial Relations, Social Equity, Social Security, Growth of Labour Legislation in India and Government Schemes for welfare of Labour Classes.
   4. Providing basic knowledge to the students about the Payment of Wages 1936 and also the Minimum Wages Act, 1948.
   5. Providing an elementary understanding of the Employees' State Insurance Act, 1948 and the Payment of Bonus Act, 1965.

3. **Five units of Syllabus:**

Unit	Content	Hours
1	Trade Union–Definition, Concepts, Importance, Registration and Recognition: Definitions of 'trade union', 'workman' and 'trade dispute' –The Trade Unions Act, 1926, sections 2(g) and (h), 3-13, 15, 22 Immunities in trade disputes : Criminal and Civil: The Trade Unions Act. 1926, sections 17 and 18-The Indian Penal Code, sections 120-A,120 –B- Industrial Relations Problems in the Public Sector- Growth of Trade Unions-Codes of conduct	18
2	Laws related to Industrial Relations and Industrial Disputes: Industrial Disputes Act, 1947: Definition, Authorities, Awards, Settlements, Strikes Lockouts, Lay Offs, Retrenchment and Closure. The Trade Union Act,1 926 Disputes–Impact–Causes–Prevention–Industrial Peace–Government Machinery-Conciliation–Arbitration–Adjudication	18
3	Concept–Objectives–Scope–Need-Voluntary Welfare Measures–	18

	Statutory Welfare Measures- Labour- Welfare Funds-Education and Training Schemes-Laws related to Health, Safety and Welfare: The Factory Act 1948: (Provisions related to Health, Safety and Welfare. The Workmen's Compensation Act, 1923 Provisions – Introduction- A) Thedoctrine of assumed riskB) The doctrine of Common EmploymentC) The doctrine of Contributory Negligence. II-Definitions III-Employersliability for compensation (S-3 to 13). IV-Rules as to Compensation (Sec4toSec9)(14A&17)	
4	Social Legislation: Employee State Insurance Act 1948: Definition and Employees Provident Fund. Miscellaneous Provision Act 1948: Schemes, Administration and determination of dues. Causes of Accidents – Prevention–Safety–Provisions–Industrial Health and Hygiene Importance– Problems-Occupational Hazards- Diseases – Psychological problems- counseling statutory provisions	18
5	Laws Related To Compensation Management: The payment of WagesAct1948: Objectives, Definition, Authorized Deductions Payment of Bonus Act, 1965. The Payment Of Gratuity Act, 1972. Child Labour –Female Labour- Contact Labour – Construction Labour– Agricultural labour–Disabled–Welfare of knowledge–Social Assistance–Social Security-Implications Book References1.MamoriaC.B.	18

4. Books for Reference:

1. Shukla M. C, Mercantile Law, Sultan Chand, New Delhi, 2009.
2. Industrial and Labour Laws, Dr.Sanjeev Kumar, Bharat Law HP Ltd.
3. Labour and Industrial Laws, S.N Misra, Central Law Publication.
4. Kapoor N.D, Elements of Mercantile Law, Sultan Chand & Sons, New Delhi, 2010.
5. Padhi PK, PHI learning Pvt. Ltd. New Delhi, 2019.

5. Teaching Learning Method:

  PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion

6. Course Outcome (CO):

After Completion of the Course Industrial Law and Labour Welfare the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	The student knows about the basic concepts relating to Industrial Jurisprudence and Labour Policy in India	K1
CO 2	The student has elementary knowledge about industrial peace, labour harmony and is capable to apply labour laws In day to day labour issues and problems.	K4
CO 3	The student has full knowledge of government schemes of Welfare for labour classes.	K2

CO 4	The student has general knowledge regarding Issues of wages, bonus and State Insurance.	K4
CO 5	The student has general awareness about Industrial Relations, Social Equity and Social Security	K2

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	2	2	3	2	2	2	2	2	2	31
CO2	3	3	2	3	2	3	3	2			1	1	2	25
CO3	3	3	2	3	2	3	3	3		1	3		2	28
CO4	3	3	3	2	2	3	3	2	2		3	1	1	28
CO5	3	3	2	3	3	3	3	3	3	2	2	1	1	32
Grand Total of COs with PSOs and POs														144
Mean Value of COs with PSOs and POs (144/60)														2.4

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			2.4
Observation	COs of Industrial Law and Labour Welfare strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514
DEPARTMENT OF COMMERCE

Class	**: II M.Com**	**Part**	**: Core**
Semester	**: III**	**Hours**	**: 90**
Subject Code	**: 22PCMC93**	**Credits**	**: 05**

1. Title of the Paper: FINANCIAL MANAGEMENT

2. Course Educational Objectives (CEO):
1. To Perceive the Basics of Financial Management.
2. To Appraise the Required Liquidity to Run the Enterprises.
3. To be Aware of Financial Stability of the Firm.
4. To Evaluate and Identify the Suitable Project Proposals.
5. To Estimate the Dividend Portion for Shareholders.

3. Five Units of Syllabus:

Unit	Content	Hours
1	Financial Management:Concept-nature-objectives–functions-significance scope; financial decision making and types of financial decisions; role of finance manager in a firm–organization of financial management –time value of money – concept of risk and return. (Theory only)	18
2	Cost of capital and capital structure; concept – types of cost of capital and their measurement concept of capital structure-features of optimum capital structure–factors affecting capital structure-theories of capital structure; Leverage: operating leverage(OL)- Financial leverage(FL)–Combined leverage(CL)	18
3	Capital budgeting decisions: Concept-significance of capital expenditure decisions-capital budgeting process. Methods of evaluating capital budgeting–pay–back period–accounting rate return–net present value–internal rate of return.	18
4	Working Capital planning and Management: Basics of working capital planning; estimation of working capital requirement- sources of working capital-factors determining working capital–cash and receivables management.	18
5	Dividend Policy: concepts- different policies and practices - determinants of dividend policy Theories of dividend; valuation – Walter, Gordon and M.MTheory Assumptions and limitations.	18

(Note: Question Papers Consists of 20% theory and 80% Problem.)

4. Books for Reference:

1. I.M.Pandey, Financial Management, Vikas Publications, New Delhi.
2. VanHorne, C.James, Financial Management and Policy, Prentice Hall of India, New Delhi.
3. Ashwath Damodharana, Corporate Finance Theory and Practice, John Willey and Sons, New York, 2nd edition,
4. S.N.Maheswari, Financial Management, Sultan Chand and Sons, New Delhi
5. MY.khan & PK Jain, "Financial management" Tata McGraw Hill, New Delhi, 2018

5. Teaching Learning Methods:

Power Point Presentation, Group Discussion, Assignment, chalk and talk method

6. Course Outcome (CO):

After Completion of the Course Financial Management the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Grasp Financial Management Concepts.	k2
CO2	Identify the constructive way of working capital planning	k3
CO3	Formulate the significance of cost of capital and capital structure of formation	k4
CO4	Analyze various methodology in preparation of capital budgeting	k4
CO5	Appraise the significance of dividend policy	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	2	2	3	2	3	3	2	2	2	31
CO2	3	3	2	3	2	3	3	2			1	1	2	25
CO3	3	3	2	3	2	3	3	3		1	3		2	28
CO4	3	3	3	2	2	3	3	2	2		3	1	1	28
CO5	3	3	2	3	3	3	3	3	3	2	2	1	1	32
Grand Total of COs with PSOs and POs														144
Mean Value of COs with PSOs and POs (144/61														2.36

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			2.36
Observation	COs of Financial Management strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II M.Com	Part	: CORE
Semester	: III	Hours	: 90
Subject Code	: 22PCMD03	Credit	: 05

1. Title of the Paper: OPERATIONS RESEARCH

2. Course Educational Objectives (CEO):
To facilitate the learners:
- Understand the need of using Operation Research as a quantitative approach for effective decision making
- To able build and solve transportation & assignment problem using appropriate method.
- Knowledge of formulation mathematical models for quantitative analysis of managerial problems in industry
- Skills in the use of Operations Research approaches and computer tools in solving real problems in industry
- Mathematical models for analysis of real problems in Operations Research

3. Five units of Syllabus:

Unit	Content	Hours
1	Operation Research – Introduction , OR Models, Areas of Applications – Linear Programming – Formulation of LPP – Graphical Method – Minimization & Maximization Problems	18
2	Transportation Models Balanced/Unbalanced, Minimization / Maximization – The Northwest Method, The lowest Cost Method – Vogel's Approximation Method – Modified Distribution (MODI) Method– The Assignment problem–meaning-General Model-Hungarian Method (Minimization and Maximization) – Unbalance assignment method	18
3	Replacement Theory–Introduction-Failure mechanism of items considerations leading to replacements–O.R methodology of solving replacement problems–replacement policy for equipment/ Asset which deteriorates gradually.	18
4	Network Analysis-Introduction–Types of networks CPM, Critical Path Method and PERT–The Basic Differences–Drawing a network–Obtaining a Critical Path–Time estimates for activities. Probability of	18

	Completion of Project–Determination of floats.	
5	Game theory – Definition – Saddle point – Two person Zero sum Game – Pure and Mixed Strategies–Algebraic Solution procedure–Graphical Solution–Principle of Dominance. Sequencing Problem– Processing ofn jobs through Two Machines and mMachines –Graphical Method of Two jobs mMachines Problem	**18**

4. Books for Reference:

1. Taha, H.A. (2017). Operations research-an introduction (10thed.). New Delhi: Pearson Prentice Hall (Indian print).
2. Operations Research, V.K. Kapoor, Sultan and Sons
3. Operations Research, J.K. Sharma, MacMillan India Ltd.,
4. Waters, D.(2003). Inventory control and management (2nd ed.). West Sussex: John Wiley & Sons Ltd.
5. Operations Research, Taha. H.A. Macmillan

5.Teaching Learning Method:

　　PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion

6.Course Outcome(CO):

After Completion of the Course Operations Research the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Demonstrate the application of OR and frame a LPP with solution.	K4
CO 2	Solve Transportation and assignment problems using appropriate method.	K4
CO 3	Acquire the knowledge about replacement of resources	K4
CO 4	Apply simple models of CPM and queuing to improve decision making and develop critical thinking and objective analysis of decision problems.	K4
CO 5	Enable to take best course of action out of several alternative courses for the purpose of achieving objectives by applying game theory and sequencing models.	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	2	2	3	2	3	3	3	3	2	35
CO2	3	3	2	3	2	3	3	2	3		2		2	28
CO3	3	3	2	3	2	3	3	3		3		3	2	30
CO4	3	3	3	2	2	3	3	2	2	2	1	1	3	30
CO5	3	3	2	3	3	3	3	3	3	2	2	3	3	36
Grand Total of COs with PSOs and POs														159
Mean Value of COs with PSOs and POs (159/61)														2.60

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			2.60
Observation	COs of Operations Research strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II M.Com	Part	: III CORE
Semester	: III	Hours	: 90
Subject Code	: 22PCMD13	Credit	: 05

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1. Title of the Paper: EXPORT AND IMPORT MANAGEMENT

2. Course Educational Objectives (CEO):
- To learn structure of International Trade Environments
- To have a better understanding of export.
- To disseminate knowledge on documentation.
- To acquaint the students with pre and post shipment formalities.
- To enlighten about foreign trade policies.

3. Five Units Syllabus:

Unit	Content	Hours
1.	International Trade Environments Introduction of International Trade Environments- Globalisation- Issues in Globalisation - GATT agreements - Impact of WTO on export import -Regional Trading (SAFTA/ NAFTA/ BRICS/SAARC etc.) - Category of export -- Customs Act – Role and functions of Export Promotion council, Commodity boards, Directorates of commercial intelligence and statistics, Indian trade promotion organization, IIFT	18
2.	Export: Types of exporters-Registration of exporters. Major Export from India –Licensing. Facilities available to EOU`S, SEZ`S, and Status holders duty draw back procedures other incentives	18
3.	Documentation - Performa invoice, commercial invoice and its attestation, packing list, Inspection, certificate, certificate of origin, GSP certification, shipping bills, A.R,A.R(4) forms, Mate receipts, GR-Forms or SDF, Marine insurance policy, ECGC policy, bill of exchange, bank certificate for Export B/L, AWB, Special Consular Invoice-bill of entry and air way bill	18
4.	Pre shipment inspection formalities – inspection agencies- compulsory inspection control Act 1963 – customs clearance of export cargo – post shipment formalities and procedures excise duty and customs clearance.	18
5.	Foreign trade policies-EXIM Policy-Foreign trade policy 2004-09-provisions Negative list-Restricted list, Shipment of Export cargo: By sea, air, ICD, courier, land customs station and by Post-Procedure and Documents required for shipment of cargo.	18

4. Books for Reference:
1. Usha Kiran Rai (2010), Export–Import and Logistics Management, PHI learning Pvt Ltd, New Delhi.
2. Mahajan, M.I Exports- Doity our self- Snow White Publications, Mumbai.

3. Export –Import Policy: Ministry of Commerce, Government of India.
4. Hand book of Export Import Procedures: Ministry of Commerce,
5. Export Marketing–Francis Cherunilam

5. Teaching Learning methods:
Power point presentations, Group Discussion, Seminar, Quiz, Assignment, Scenario analysis

6. Course Outcome (CO):
After Completion of the Course Export and Import Management the students will be

Sl. No.	Course Outcome	Knowledge Level
CO1	Determine the International trade environments	K1&K2
CO2	Examine the registration of exporters	K3
CO3	Appraise the documentation procedure	K4
CO4	Elaborate the shipment formalities	K4
CO5	Evaluate the foreign trade policies	K5

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	2	2	3	2	3	3	2	3	2	34
CO2	3	3	2	3	2	3	3	2	3	3	2		2	31
CO3	3	3	2	3	2	3	3	3	3	3			2	30
CO4	3	3	3	2	2	3	3	2	2	3		3		29
CO5	3	3	2	3	3	3	3	1		2	2			25
Grand Total of COs with PSOs and POs														149
Mean Value of COs with PSOs and POs (149/57)														2.61

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			2.61
Observation	COs of Export and Import Management strongly related with PSOs and Pos		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	**: II M.Com**	**Part**	**: Core- Elective 3**
Semester	**: III**	**Hours**	**: 90**
Subject Code	**: 22PCME33**	**Credits:**	**04**

RESEARCH METHODOLOGY

1. **Title of the paper**: Research Methodology
2. **Course Educational Objectives (CEO):**
    1. Understand the basic concept of Research
    2. Aware of the identification of problem specification and research design
    3. Acquire knowledge regarding methods of collecting data and tools used to collect the data
    4. Get idea about the data processing and analysis
    5. Have knowledge regarding the report writing and presentation

3. **Five Units of Syllabus:**

Unit	Content	Hours
1.	Introduction to Research Meaning of Research–Objectives and importance–Types of research-Pure and applied research-Experimental and non - experimental research-research process-Research Method vs Research methodology-Features of Good research.	**18**
2.	Problem Specification and Research Design Defining and Formulating Research problem: Process – Sources of Research Problem – Review of Literature: Objectives – Importance and Sources. Research Design: Meaning – Objectives – Importance – Types –Features of a Good Research Design. Formulation of Research Hypothesis: Meaning – Objectives – Importance – Types –Source – Qualities of a Good Hypothesis.	**18**
3.	Collections of Data Data Collection: Sources of Data – Methods and Techniques of Data Collection – Sampling: Meaning – Merits – Types – Sampling errors – Data Collection Tools: Questionnaire and Interview Schedule – Scaling Techniques: Meaning – Types.	**18**
4.	Processing and Interpretation of Data Processing of Data: Editing – Coding and Classification – Transcription – Tabulation –Measuring of scale-Rating Scales— Statistical Analysis.	**18**
5.	Report Writing and Presentation Research Report: Meaning – Objectives – Importance – Types – Process – Structure and Components –Tabular and Graphical Presentation-Qualities of a Good Research Report.	**18**

4. Book for Reference:
1. O.R. Krishnaswami and M. Ranganatham., Methodology of Research in Social Sciences, Himalaya Publishing House
2. R.Paneerselvam, Research Methodology, Prentice Hall of India Pvt. Ltd., New Delhi 2015
3. Deepak Chawla and Neena Sondhi, Research Methodology, Vikas Publishing House PVT
4. C.R.Kothari, Research Methodology, New Age International Publishers Ltd.
5. Rao K V., Research Methodology in Commerce and Management, (Sterling Publishers Pvt. Ltd., Chennai, 2012).

5. Teaching Learning methods:
PPT, Lecture, Test, Assignment

6. Course Outcome(CO):

After Completion of the Course Research Methodology the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO 1	Explain the concept of research and methodology, acquired the knowledge about good research.	K1 & K2
CO 2	Designing the research problem and frame a research topic, and also learn overall content of the report.	K3
CO 3	Acquire knowledge to design the questionnaire and interview schedule for collection of primary data to identify the sample size.	K3
CO 4	Find the different types of tools used in analysis and interpret the analyzed data.	K4
CO 5	Developing research knowledge and finalizing the report in a proper manner and explore their presentation in report.	K5

K1=Knowledge   K2=Understanding   K3=Application

Mapping of COs with PSOs and POs

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 and POs
CO1	3	3	3	3	2	3	3	2	1	1	2	1	2	29
CO2	3	3	3	2	2	3	3	2	1	2	2	1	2	29
CO3	3	3	3	2	2	3	3	2	2	2	2	1	2	30
CO4	3	3	2	2	2	3	3	2	2					22
CO5	3	3	3	1	2	3	3		1	2		2	1	24
Grand Total of COs with PSOs and POs														134
Mean Value of COs with PSOs and POs(134/60)														2.23

Strong -3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation			
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.23
Observation	COs of Research Methodology strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class   : II M.Com   **Part   : III Core**
Semester   : IV   **Hours : 90**
Subject Code : 22PCMD24   **Credits : 05**

Title of the paper**: ADVANCED CORPORATE ACCOUNTING**

Course Educational Objectives (COE):
  1. To understand the preparation of final accounts of banking companies
  2. To Know the legal requirements of Banking companies
  3. Record the transactions of life Insurance companies
  4. To aware the transactions of holding companies.
  5. To knowledge in preparing the accounts of public utility concern

   3. Five Units Syllabus:

Unit	Content	Hours
1.	Introduction–Business of banking companies–legal requirements– preparation of profit and loss account–Guidelines of RBI for Profit and Loss account Advanced Accountancy. Balance Sheet– Guidelines of RBI for Balance sheet– items requiring special attention in preparation of final accounts.	18
2	Introduction–types of Insurance–accounts of life insurance business and Accounts of General insurance companies statutory books– preparation of final accounts– revenue a/c – Net Revenue Account and Balance Sheet-Valuation Balance Sheet	18
3	Holding company: meaning –definition – legal requirements reating to presentation of accounts-consolidated financial statements- preparation of consolidated Balance Sheet-steps involved in preparation of consolidated balance sheet.	18
4	Accounts of Electricity companies–meaning–features–advantages– Double account system Vs single account system-computation of	18

	Capital base-preparation of final accounts of public utility concerns.	
5	Price level changes-Inflation(simple problems)-Corporate Social responsibility accounting (Simple Problems)-Human Resource accounting (Theory part)	18

(Question paper consists of 20% Theory and 80% problem)

4. Books for Reference:
1. T.S.Reddy & A.Murthy, "Corporate Accounting" Margum Publications, Chennai, 2014
2. S.P.Jain and K.L.Narang, Advanced Accounting, Kalyani Publishers, Latest edition
3. B.S.Raman, Corporate Accounting United Publishers, Latest edition
4. R.L.Gupta and M.Radhaswamy, Advanced Accountancy Sultan Chand & Sons, Latest edition
5. Haniff & Mukherjee, "Modern Accountancy" Tata MC.graw Hill Publishing company Limited, New Delhi, 2004

5. Teaching Learning methods:
   PPT, Lecture, Test, Assignment

6. Course Outcome (CO):
   After Completion of the Course Advanced Corporate Accounting the students will be

CO	Course Outcome	Level
CO1	Identify legal requirements for Banking Accounts and classify advances by Banks	**K2**
CO2	Formulate final accounts for Life and General Insurance companies	**K3**
CO3	List out and prepare revenue accounts as per the new Insurance Regulations	**K3**
CO4	Prepare General Balance Sheet of Public Utility	**K4**
CO5	Formulate the Inflation accounting and Human Resource accounting.	**K4**

Mapping of COs with PSOs and POs

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 and POs
CO1	3	3	3	2	2	3	3	2	3	2	2	2	1	31
CO2	3	3	3	2	2	3	3	2	3	2	2	1		29
CO3	3	3	2	2	1	3	3	2	2	2	1	1	2	27
CO4	3	3	2	2	3	3	3	2	2				1	24
CO5	3	3	1	2	2	3	3	3		1			1	22
Grand Total of COs with PSOs and POs														133
Mean Value of COs with PSOs and POs(133/58)														2.29

Strong-3, Medium-2, Low-1

Mapping Scale	1	2	3
Relation			
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.29
Observation	COs of Advanced Corporate Accounting strongly related with PSOs and Pos		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514
DEPARTMENT OF COMMERCE

Class	: II M.Com	**Part**	: III CORE
Semester	: IV	**Hours**	: 90
Subject Code	: 22PCMD34	**Credit**	: 05

1. Title of the Paper: ADVANCED HUMAN RESOURCE MANAGEMENT

2. Course Educational Objectives (CEO):

1. To equips student to work in the field of human resource management.
2. Key functional area sare considered with in a strategic and contextualized framework,.
3. Create awareness ways to strengthen organizations for all stake holders.
4. To builds the necessary knowledge base for working in employment relations,.
5. To emphasis is knowledge in action.

3.Five Units Syllabus:

Unit	Content	Hours
1.	Concept and Nature of HRM-HR Masa Profession, Importance of RHM, Functions and Scope of HRM–Human Resource Planning –Need and Importance-Process and Levels of HRP, Obstacles to HRP.	18
2.	Meaning of Recruitment, Sources of Recruitment–Meaning and Process of Selection- Selection Test and Interviews. Concept of Placement- Concept and Objectives of Induction – Contents of Induction Programme- Advantages Of Formal Induction	18
3.	Human Resource Development: Training and Development, Training of Operatives, Executive development, Career planning and development	18
4.	Compensation, Wage and salary Administration: Incentive plans and profit sharing, Appraisal and Job Changes, Performance appraisal: Traditional Vs Modern methods, Job changes, Transfers, Promotions and Separations, Absenteeism and Labour Turnover. Maintenance: Health and Safety, Employee‟s Welfare, Social Security.	18
5.	Integration: Work environment, Discipline and grievance, Morale, Collective bargaining, Worker‟s participation in management,	18
	Industrial relations and industrial disputes, Trade unions, Job satisfaction, Human relations: Quality of work life – Management of Stress and burn out	

4.Books for Reference:

1. G.R.Basotia, Human Resource Management,Tamil Nadu Book House, 2013
2. Kausal Kumar, Human Resource Management, Tamil Nadu Book House, 2013
3. Kandula SrinivasR., "Strategic Human Resource Development", Prentice Hall of India, New Delhi, 2012

4. Gupta.C.B, Human Resource Management Text and Cases, Sultan Chand & Sons,2017
5. Subbaraop,"Personnel and Human Resource Management", Himalaya Publishing House, New Delhi, 2009.

5. Teaching Methods:

PPT, Group Discussion, Chalk and Board, Videos

6. Course Outcomes (CO):

After Completion of the Course Advanced Human Resource Management the students will be

S.No	Course Outcome	Knowledge level
1.	Demonstrate there cent trends and practices in HRM	K2
2.	Observe HR Planning and Recruitment	K2
3.	Associate HR Training and developments	K2
4.	Estimate wage and salary computation and disbursement	K4
5.	Evaluate the factors influencing job satisfaction and retention	K4

Mapping of COs with PSOs and POs

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 and POs
CO1	3	3	2	2	2	3	3	2	1	2	2	2	2	29
CO2	3	3	2	2	1	3	3	2	2	1	1		1	24
CO3	3	3	3	2	2	3	3	1			2	2	2	26
CO4	3	3	3	2	1	3	3	2	1	2	1	2	1	27
CO5	3	3	1	2	1	3	3		2	2		2		22
Grand Total of COs with PSOs and POs														**128**
Mean Value of COs with PSOs and POs (128/59)														**2.16**

Strong-3, Medium-2, Low-1

Mapping Scale	1	2	3
Relation			
Quality	Low	Medium	Strong
Mean value of COs with PSOs and POs			2.16
Observation	COs of Advanced Human Resource Management strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II M.Com	**Part**	: III
Semester	: IV	**Hours**	: 90
Subject Code	: 22PCME44	**Credit**	: 04

1. **Title of the Paper: COMPETITIVE EXAM FOR COMMERCE**
2. **Course Educational objectives (CEO):**
1. To recall concept of Business Environment and Economics
2. To recall the content of Branch of accounting.
3. To highlight in the area of Research.
4. To recollect the concept and scope of Marketing and Management
5. To revise calculation of taxliability and understand tax planning.

3. Unit for syllabus

Unit	Content	Hours
1.	**BUSINESS ENVIRONMENT AND ECONOMICS** Economic Environment–Political Environment–Legal Environment– Corporate Social Responsibility – Theories of International Trade – Foreign Direct Investment (FDI) – Balance of Payment (BOP) – Regional Economic Integration – International Economic Institutions – World Trade Organisation. Business Economics: Demand & Supply Analysis – Consumer Behaviour – Law of variable Proportion–Theory of cost– Price determination under different market forms–Pricing strategies.	18
2.	**ACCOUNTS AND FINANCE** Accounting concepts ––Financial statements - Partnership Accounts - Company Accounts –Accounts for Banking & Insurance companies – Human resource Accounting – International Accounting Standards. Cost Accounting –Cost concepts - Reconciliation of cost & financial accounts. Management Accounting –Tools of management accounting: Ratio Analysis, Fund, Cash flow statements, Budgetary control, Variance analysis and Marginal costing. Financial Management -Risk and Return relationship – Cost of Capital–– Capital budgeting techniques- leverages - Risks - Capital structures – Theories –Determinants of capital structure - leasing -Dividendtheories&polices,models-Workingcapital–Workingcapitalforecasting Management of Inventories, cash and receivables.	18
3.	**STATISTICS FOR RESEARCH** Research Methodology-Scope and objectives-Types of research, Case study, Research design–Sources of data collection –Methods– Sampling -Analysis and interpretation of data – Report writing. Quantitative techniques-Correlation Analysis–Regression analysis-	18

		Timeseries. Probability–Theoretical distributions–Binomial-Poison-Normal Distribution. Hypothesis–Definition–Types-Type I Error-Type II Error-'t'test-'F' test-Chisquaretest-ANOVA.	
4.	**MARKETING ANDMANAGEMENT** Marketing–concepts–Market Segmentation–Market research–Consumer rights and protection – Consumer responsibility- 4 Ps - Pricing - Price determination process – Pricing policies and methods - Advertising –Channels of advertising -Service Marketing -Organised markets –Cooperative marketing Human Resource Management–Scope –Organisation structure - Human resource planning –JobAnalysis-Selectionandrecruitment–JobevaluationandMeritrating–Performanceappraisal - Various - Theories X and Y – Motivation theories- Learning theories- Theories of personality-Discipline-Grievance--Redressal procedure-Organisation conflict–leadership-Workers participation in management. Management – concepts- planning- organizing-staffing-directing-co-ordinating.	18
5.	**INCOME TAX AND BUSINESS LAW** Income Tax : Residential Status and Tax incidence – Agricultural Income – Computation of Tax able income under differen theads–Deduction and collection of tax at source. Indian Contract Act–Special Contracts–Sale of Goods Act 1930–Negotiable Instrument Act – The companies Act – The Information Technology Act – The RTI Act 2005 –Intellectual Property Rights (IPRs)–Goods Services Tax(GST).	18

4. Books for

Reference:

1. KVS Madhan NTAUGCNET/SET/JRF:Paper II-Commerce|First Edition|By Pearson Paper back 2021
2. Neetu Singh, Apeksha Agiwal, Satyabroto Roy NTA UGC NET Commerce Paper 2–Arihand Publications New Delhi 2021
3. Arihant Experts "NTA UGC NET/JRF/SET Teaching and Research Aptitude General Paper-1 (Compulsory) by Arihant Publication 2021
4. Vineet Kaushik UGC Net Commerce– Arihant Publications, New Delhi 2018
5. Dr.Chandrahas A.Dixit, Dr.Anand A.Muley NTA-UGC Commerce-II(NET/JRF/SET)|–Sai Jyothi Publications. New Delhi.2021

5. Teaching Methods:

PPT, Group Discussion, Chalk and Board, Videos, Journals, Quiz, Brainstorm.

6. Course Outcomes(CO):

After Completion of the Course Competitive Exam for Commerce the students will be

S.No	Course Outcome	Knowledge level
1.	Attend Environmental and Economics Questions	K2
2.	Solve the accounts	K2
3.	Workout questions in Statistics	K2
4.	Facilitate to face the questions in marketing and Management.	K4
5.	Attend and answer the questions in Income tax and legal aspects of business	K4

Mapping of COs with PSOs and POs

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 and POs
CO1	3	3	2	2	2	3	3	2	1	2	2		2	27
CO2	3	3	2	2	1	3	3	2	2	1	1		1	24
CO3	3	3	3	2	2	3	3	1			2		2	24
CO4	3	3	3	2	1	3	3	2	1	2	1	2	1	27
CO5	3	3	1	2	1	3	3		2	2		2		22
Grand Total of COs with PSOs and POs														**124**
Mean Value of COs with PSOs and POs (124/57)														**2.17**

Strong-3, Medium-2, Low-1

Mapping Scale	1	2	3
Relation			
Quality	Low	Medium	Strong
Meanvalue of COs with PSOs and POs			2.17
Observation	**COs of Competitive Exam for Commerce strongly related With PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

(for students admitted from the Academic Year 2023-2024 onwards under the CBCS pattern)

Class   : I PG   Part   : Value Added Course
Semester   :   Hours   :
Sub. Code   :   Credit   :
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1. Title of the paper : **DIGITAL MARKETING**

2. Course Objectives (CO)

➢ To enrich the students' knowledge in Digital marketing
➢ To impart knowledge in website planning and development.
➢ To enlighten the concept of Search Engine Optimisation.
➢ To create in-depth knowledge about E – Mail marketing.
➢ To demonstrate an awareness on social marketing.

3. Five units of the Syllabus:

UNIT I

Digital Marketing: Introduction – Definition – Significance – Traditional Marketing Vs Digital Marketing – Digital marketing process

UNIT II

Website planning and Development: Types of Websites – Keyword – Types of Keywords - Understanding Domain and webhosting – Building website/ Blog using CMS wordpress

UNIT III

Search Engine Optimisation :– Key word planner tools – on page SEO Techniues – Indexing and key word placement – Content optimization – Off page SEO Techniques.

UNIT IV

E mail Marketing: Introduction – Significance – Designing e –mail marketing campaigns – Building e-mail List and sign up forms - E- mail marketing strategy and monitoring – E –mail Automization.

UNIT V

Social Media Marketing: Introduction – Significance – Face book marketing :Inroduction -
Types of various Ad formats – Use of different social media platforms – Content creation

 4. Book for Study
    1. 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.RitikaAggarwal, Digital marketing, Bluerose Publishers Pvt Ltd, 2021
    3. Swayam Material

External Question Pattern for M.COM
(Students who are joining from 2021-22 under
OBE Pattern)

TotalMarks:100   **Time**:3hrs
            Section–A   **(10 X1=10 marks)**
                    Answer All the questions
                        (Multiple Choice Question)

Unit	Question Numbers	REMEMBERING LEVEL (Bloom's Taxonomy)
I	**1&2**	
II	**3&4**	
III	**5&6**	**KI&K2**
IV	**7&8**	
V	**9&10**	

            Section–B   **(5 X6=30marks)**
        Answer all the questions not exceeding 2 pages

Unit	Question Numbers	REMEMBERING LEVEL (Bloom's Taxonomy)
I	11.**(a)or(b)**	
II	12.(**a)or(b)**	
III	13.**(a)or(b)**	**K3& K4**
IV	14.**(a)or(b)**	
V	15.**(a)or(b)**	

                Section–C

                                            (5X12=60mar
    ks) Answer all the questions not exceeding 4 pages

Unit	Question Numbers	REMEMBERING LEVEL (Bloom's Taxonomy)
I	16.**(a)or(b)**	
II	17.**(a)or(b)**	
III	18.**(a)or(b)**	**K3,K4&K5**
IV	19.**(a)or(b)**	
V	20.**(a)or(b)**	

DEPARTMENT OF COMMERCE

PART	SUBJECT CODE	PAPER	Hrs	Cr
I SEMESTER				
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
II SEMESTER				
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
III SEMESTER				
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

IV SEMESTER

		Core		
III	22UCOC84	Corporate Accounting - I	06	05
	22UCOP44	E-Commerce	06	04
	22UCOC94	Business Management	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

V SEMESTER

		Core		
III	22UCOD15	Cost Accounting	05	05
	22UCOD25	Income Tax -I	05	04
	22UCOP55	Auditing	05	04
	22UCOD35	International Business	05	04
	22UCOD45	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

VI SEMESTER

		Core		
III	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	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

ARULANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
PG DEPARTMENT OF COMMERCE

Class	: II B.Com Gen	**Part**	: III
Semester	: III	**Hours**	: 90
Subject Code	: 22UCOC53	**Credits:**	05

1.Title of the Paper: PARTNERSHIP ACCOUNTS

2.Course Objectives (CO):

At the end of the course students will be able to
1. Describe the importance of partnership firm in the business environment
2. Examine the method of maintaining partner's capital account.
3. Ascertain the proper accounting treatments during admission, retirement and death of a partner.
4. Appraise the accounting procedure of amalgamation of firms.
5. Evaluate the method of dissolution of firms and settlement of accounts; sale of partnership firms to company.

3.Five Units of Syllabus:

UNITS	CONTENT	HOURS
I	**Partnership:** Meaning – Features – Kinds – Partnership Deed – Appropriation of Profit & Loss Account–LLP–Accounting procedures.	18
II	**Admission of a Partne:** Profit sharing ratio–Goodwill–Revaluation of Assets and liabilities – Retained earnings and Accumulated Losses–book values are not to be altered (Memorandum revaluation method).	18
III	**Retirement of a partner:** Ascertainment of a mount due to Retiring partner–simultaneous retirement and admission–Death of a Partner–Profit Sharing ratio–Joint Life Policy.	18
IV	**Amalgamation of firms:** Meaning– accounting procedure– Assets and liabilities not taken over.	18
V	**Dissolution of Partnership:** Dissolution of firm – Dissolution by the court – settlement of accounts – Dissolution Accounts –Gradual realization of Assets and Piecemeal Distribution–Insolvency of a partner–Insolvency of more partners than one - Insolvency of all partners. Sale of Partnership Business to Company–Accounting Entries.	18

4.Book for Study
1. T.S.Reddy and A.Murthy, Advanced Accountancy, Margham Publications, Chennai, 2018.

5.Books for Reference
1. M.C.Shukla, Advanced Accounting I, Sultan Chand & Sons., New Delhi, 2009

2. MukerjeeandHanif,AdvancedAccountingVolI,TataMcGrawHillCompanyLimited,New Delhi,2009
3. S.P.Iyengar, Advanced Accounting Vol I, S.Chand & Sons, New Delhi, 2009
4. S. Kr.Paul, Advanced Accountancy Vol I, Central Publishing Company, Kolkatta, 2006

6.Teaching Learning Methods

 Chalk and Talk, PPT, Problem solving, Assignment

7.Course Outcome (CO)

After Completion of the Course Partnership Accounts the students will be

Sl. No.	Course Outcome	Knowledge Level
CO1	Define and examine the accounting principles, underlying financial statement and their implementation in partnership firm.	K1 & K3
CO2	Interpret the financial result after admission of a partner and explain different accounting policies.	K3
CO3	Interpret the financial result after retirement and death of a partner and explain different accounting policies.	K3
CO4	Discuss the case Garner Vs Murray and solve problems relating to insolvency of partners.	K2,K3
CO5	Develop the procedure involved in amalgamation and sale of firm in the partnership accounts.	K3

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		2	1	28
CO3	3	3	2	2	3	3	3	2	2	3	2	1	-	29
CO4	3	2	3	3	1	3	3	3	2	2	3	-	1	29
CO5	3	3	3	2	2	3	3	2	3	2	-	2	1	29
Grand Total of COs with PSOs and POs														142
Mean Value of COs with PSOs and POs (142/59)														2.40

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
Meanvalue of COs with PSOs and Pos			2.40
Observation	COs of Partnership Accounts-strongly related with PSOs and POs		

Class	: II B.Com Gen	Part	: III
Semester	: III	Hours	: 90
Subject Code	: 22UCOC63	Credits	: 04

1.Title of the Paper: WORKING CAPITAL MANAGEMENT

2.Course Objectives(CO):
1. To understand about the working capital.
2. To provide in – depth understanding about planning of working capital
3. To impart knowledge about working capital financing.
4. To enable the students to learn working capital control and banking policy.
5. To aim at making experts in Inventory and receivable management.

3.Five Units of Syllabus:

UNITS	CONTENT	HOURS
I	**Working Capital:** Introduction–Types, Sources of working capital-Trade off between profitability and risk–Determining financing risk.(Simple Problem only)	18
II	**Planning of Working Capital:** Introduction–Need–Changes in working capital–Reasons–Determinants of working capital– Computation of working capital.	18
III	**Working Capital Financing:** Introduction–Trade credit–Advantages–Bank credit–Forms of credit–Term loans of working capital– Forms of financing.	18
IV	**Working Capital Control and Banking Policy:** Introduction–Dehejia committee–Tandon committee–Chore committee–Marathe committee–Kannan committee–Recent RBI guideline regarding working capital finance.	18
V	**Inventory & Receivable Management:** **Inventory Management:** Introduction–Objectives–Techniques. **Receivable Management:** Objectives–Credit policies–Credit terms–Collection policies.	18

4.Book for Study
  1. Dr.S.N.Maheshwari, Financial Management– Sulthan Chand & Sons, Chennai.

5.Books for Reference
  1. MYKhan & PK Jain, Financial Management–Tata McGraw-Hill Company Ltd., New Delhi.

6.Teaching Learning Methods
    Chalk and Talk, PPT, Problem solving, Assignment

7.Course Outcome (CO)

After Completion of the Course Working Capital Manangement the students will be

Sl.No.	Course Outcome	Knowledge Level
CO1	Define the working capital and sources of working capital.	K1
CO2	Develop the skills on planning of working capital.	K2
CO3	Analyse working capital financing.	K3
CO4	Demonstrate working capital control and banking policy.	K4
CO5	Understand the importance of inventory and receivable management.	K5

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		2	1	28
CO3	3	3	2	2	3	3	3	2	2	3	2	1	-	29
CO4	3	2	3	3	1	3	3	3	2	2	3	-	1	29
CO5	3	3	3	2	2	3	3	2	3	2	-	2	1	29
Grand Total of COs with PSOs and POs														**142**
Mean Value of COs with PSOs and POs (142/59)														**2.40**

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
Meanvalue of COs with PSOs and Pos			2.40
Observation	**COs of working capital Management-strongly related with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625514
DEPARTMENT OF COMMERCE

Class	: II B.Com Gen	**Part**	: III
Semester	: III	**Hours**	: 90
Subject Code	: 22UCOC73	**Credits:**	04

1. Title of the Paper: BANKING THEORY LAW AND PRACTICES

2. Course Objectives (CO)

At the end of the course, students will be able to
- i. Identify the relationship between banker and customer.
- ii. To familiarize various types of cheques.
- iii. To understand the duties and responsibilities of paying and collecting banker.
- iv. To interpret and examine loans and advances.
- v. To enhance practical knowledge in value added banking services.

3.Five units of Syllabus

UNITS	CONTENT	HOURS
I	Banking:Meaning-definition-Types of banks in India-functions of Commercial banks -Relationship of banker and Customer-General relationship, Special relationship. Opening and Operations of bank accounts:-Types of Accounts–Types of Customer/Account holders.	18
II	Cheque: Definition of Cheque - Essentials of a Cheque-Drawing of a cheque-Type of cheques-material alteration-Crossing-different forms of crossing and their significance-Loss of cheques in transit-Endorsement-Types of Endorsement and their legal effect.	18
III	Paying and collecting Bankers:Rights, responsibilities and duties of paying and collecting bankers-Precautions to be taken in paying and collection of cheques-payment in due course, holder in due course- recovery of money paid by mistake.	18
IV	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.	18
V	Value added banking services: Automated Teller Machines-Cash Deposit Machines-Creditcards-Debitcards-Internet banking-Mobile banking - SMS banking. Fund Transfer methods: Electronic Clearance System-Real Time Gross Settlement-National Electronic Fund - Transfer-Mobile Applications – BHIM App – IMPS-Paytm- Google pay and others.	18

4. Text Book

1. Gordon K and Natarajan E, Banking Theory, Law and Practice, Himalaya Publishing House, New Delhi, 2019.

5.Reference Book:

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 Banking Theory Law and Practices the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Understand the concept of banking, functions, the relationship of banker with the customer	K2
CO2	Know the procedural formalities in dealing with different kinds of Cheque, Crossing, alterations and Endorsement	K1
CO3	Develop a perfect theoretical knowledge on Paying and collecting Bankers, their duties and responsibilities, payment in due course, Holder in due course	K3
CO4	Differentiate the documents of title to goods	K3,K4
CO5	Learn electronic fund transfer system.	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
Grand Total of COs with PSOs and POs														137
Mean Value of COs with PSOs and POs (137/58)														2.36

Strong-3, Medium-2, Low-1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Mediu m	Stron g
Meanvalue of COs with PSOs and POs			2.36
Observation	COs of Banking Theory Law & Practices strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: II B.Com Gen	**Part**	: III (Allied-3)
Semester	: III	**Hours**	: 75
Subject Code	: 22UCOA33	**Credits:**	04

BUSINESS MATHEMATICS

1. Title of the Paper: Business Mathematics

2. Course Objectives (CO):

1. To understand the concept of Interest calculation
2. To enlighten the students in the basics of sets.
3. To demonstrate the concept of permutation and combination
4. To understand the concept of matrices
5. To impart the knowledge of Central Tendency

3. Five Units of syllabus:

UNITS	CONTENT	HOURS
I	Commercial Arithmetic: Percentage-simple and Compound Interest-true and Bankers discount-Annuity-Exchange arithmetic.	20
II	Theory of sets: Elements of set- Types of sets- Venn diagrams-union of sets, Complements and intersection-Demargon's law.	15
III	Permutation and combinations: Rules–Fractional notation-Circular permutations-Complementary theorems-restricted combinations.	15
IV	Matrices-Basic concepts–Types of matrices–operations on matrices – transpose of a matrix – Determinants and their properties.	15
V	Arithmetic and Geometric progressions: Arithmetic progressions-sum of series in Arithmetic Mean – Geometric progressions- sum of series in geometric Mean.	10

4. Book for Study

1. Manoharan.M & Elango.C, (2010), "Business Mathematics", Palani Paramount Publication, Palani.

5. Books for Reference:

1. M.Wilson, (2011),"Business Mathematics", Himalaya Publication House, Mumbai.
2. Peer Mohamed & Shazuli Ibrahim, (2008),"Business Mathematics", Pass Publication, Madurai.

6. Teaching Learning methods:

PPT, Lecture, Test, Assignment

7. Course Outcome (CO):

After Completion of the Course Business Mathematics the students will be

CONo.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Familiarise the students with the Basic Mathematical concepts for their higher studies	K1&K 2
CO2	Computing the problems in different sets	K2
CO3	Interpret the problems of permutation and combination	K3
CO4	Understand of different methods of Matrices.	K3
CO5	Apply central tendency treatments in their life	K2

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	2	3	29
CO2	3	3	2	3	3	3	2	3	-	-	2	2	1	27
CO3	3	3	2	2	-	3	3	-	3	3	-	1	-	23
CO4	3	3	3	3	3	3	2	2	-	-	3	1	2	28
CO5	3	2	-	2	3	3	2	2	3	1	3	-	3	27
Grand Total of COs with PSOs and POs														**134**
Mean Value of COs with PSOs and POs (134/56)														**2.52**

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			2.52
Observation	**COs of Business Mathematics strongly related with PSOs and POs**		

Class	: II BCOM Gen	Part	: IV NME
Semester	: IV	Hours	: 45
Subject Code	: 22UCON13	Credits: 02	

1.Title of the Paper: RETAIL MARKETING

2.Course Objectives(CO)

1.To explain about retailing

2.To impart knowledge on branding in retailing.

3.To infer the relevant procedures involved in retail merchandising.

4.To give knowledge in retail pricing

5.To Generalize consumerism and ethics in retailing.

3.Five units of the Syllabus:

UNITS	CONTENT	HOURS
I	Introduction to Retail- Types of Retailers – Functions of retailers – Retail Marketing: Meaning – Classification of Retail marketing.	9
II	Branding in Retailing – Definition – Advantages – Brand Loyalty – Reasons for setting up Loyalty scheme – Types of brands – Brand updating - Brand Extension	9
III	Retail merchandising – meaning – Phases in developing merchandise plan – Key areas in merchandise management – Methods of planning and calculating inventory levels.	9
IV	Retail Pricing : meaning – Definition- Factors influencing pricing – Pricing and the relationship to value – Consumer behavior and retail operations – Pricing policies	9
V	Consumerism and Ethics in Retailing: Consumerism – Definition – Reason for consumerism – Evolution of legislations for consumer protection – Role of information technology in Retailing.	9

4.Text Book:
1.Dr.L.Natarajan, Retail Marketing, Margham Publications, 2020

5.Reference Books:
1. Levy, M., & Weitz, B., Grewal D. , Retail Management, McGraw– Hill Education, 2019.
2. Samant Yuvraj. The Rise of E-Tailing in India, LAP Lambert Academic Publishing, 2013
3. Ramesh Mittal, Ruchi Nayyar, S.L.Gupta. Retailing and E-Tailing Paperback– 2011.

6. Teaching Learning Methods:

PowerPoint Presentation, Group Discussion, Quiz, Assignments, etc….

7. Course Outcome (CO):

After Completion of the Course Retail Marketing the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Familiarise the concept of retailing.	K1
CO2	Gain the knowledge on branding in retailing.	K2
CO3	Learn pricing policies in retailing.	K2 &K3
CO4	Grasp the methods of planning and calculating inventory levels	K3
CO5	Evaluate the Consumerism and Ethics in Retailing	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	2	3	29
CO2	3	3	2	3	3	3	2	3	-	-	2	2	1	27
CO3	3	3	2	2	-	3	3	-	3	3	-	1	-	23
CO4	3	3	3	3	3	3	2	2	-	-	3	1	2	28
CO5	3	2	-	2	3	3	2	2	3	1	3	-	3	27
Grand Total of COs with PSOs and POs														**134**
Mean Value of COs with PSOs and POs(134/56)														**2.52**

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			2.52
Observation	COs of Retail Marketing strongly related with PSOs and Pos		

DEPARTMENT OF COMMERCE

Class	: II B.Com Gen	**Part**	: SBE
Semester	: III	**Hours**	: 45
Subject Code	: 22UCOS13	**Credits:**	02

1. Title of the Paper: BUSINESS COMMUNICATION

2. Course Objectives (CO)

At the end of the course, students will be able to

i. Identify various structures of a business letter and the occasions for drafting letters such as an enquiry about the product, provide an offer, order and status enquiries.

ii. Paraphrasesales letters, collection letters and reminders, complaints, claims and adjustments.

iii. Appraise applications for situation vacant.

iv. Diagnose different Modern Communication methods.

v. Prepare corporate correspondence, minutes, reports and office notes.

3.Five units of Syllabus

UNITS	CONTENT	HOURS
I	Introduction to Business Communication: Essentials of Communication–Types–Barriers - Importance-Structure of Business Letters- Drafting of Different Types of Business Letters –Letter of Enquiry–Offers and Quotations–Orders–Trade References and Status Enquiries.	9
II	Business Letter:Complaints- Claims–Adjustments–Refusals–Sales Letters–Agency Letters–Collection letters-Banking Letters–Insurance Letters.	9
III	Application Letters and Memos:Letters Calling Candidates for Written Test - Drafting Interview Letters - Offer of Appointment-Provisional Appointment Orders- Final Order of Appointment-Employee Disciplinary Matters-Show Cause Notices-Charge Sheets-Letters of Dismissal and Discharge	9
IV	Electronic Communication:Internet-Tele-Conferencing-Word Processing - Desktop Publishing - Electronic Mail (E-Mail) – Audio Conferencing-Video Conferencing-Webinars-Data storage and retrieval	9
V	Corporate Correspondence: Correspondence with Shareholders and Debenture Holders Relating to Dividends and Interest-Transfer and Transmission - Internal Memos - Office Circulars - Office Orders -Office Notes - Communication with Regional / Branch Offices -Drafting of Minutes– Drafting of Reports and Office Notes.	9

4. Text Book:

1. Rajendrapal & Kohrahalli, Essentials of business communication S.Chand Publications, New Delhi, 2011.

5.Reference Book:

1. Sharma R.O & Krishna Mohan: Business Communication & Report Writing, Tata Mcgraw Hill, New Delhi, 2017.
2. Raman S & Swami R, Business Communication–A Practical Approach, Professional Publications, Chennai, 2015.
3. Asha Kaul, Business Communication, Prentice Hall India Learning Private Limited, New Delhi, 2009.

6. Teaching Learning Method

PPT, Seminar, Quiz programme, Assignment, Chalk and talk, Group Discussion

7. Course Outcome (CO)

After Completion of the Course Business Communication the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Practice on writing official correspondence	K2
CO2	Practice on writing business letter	K2
CO3	Practical exposure on application letters and memos	K3
CO4	Familiarize the concept of electronic equipment	K2
CO5	Grasp corporate correspondence	K3

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
Grand Total of COs with PSOs and POs														137
Mean Value of COs with PSOs and POs(137/58)														2.36

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
Meanvalue of COs with PSOs and POs			2.36
Observation	COs of Business Communication strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	**: II B.Com (Gen)**	**Part**	**: III Core 8**
Semester	**: IV**	**Hours**	**: 90**
Subject Code	**: 22UCOC84**	**Credits:**	**05**

1. Title of the paper : **CORPORATE ACCOUNTING I**

2. Course Objectives:
1. To train the students in the basics of issue and redemption of shares
2. To enlighten the students on the application of issue and redemption of debentures.
3. To impart the knowledge of companies profit prior to incorporation and underwriting.
4. To understand the concept of valuation of shares and goodwill.
5. To demonstrate the concept of adjustments to be made in the final accounts of joint stocks companies

3. Five Units of syllabus:

Unit	Content	Hours
1.	Company Accounts – share capital – issue of shares for cash – issue of shares other than cash -Application – Allotment Calls – Calls in Advance calls in arrear –Issue of shares at par, at premium - Issue of shares at discount-Forfeiture of shares - Reissue of forfeited shares – Forfeiture of shares when there is an over subscription and pro- rata allotment – Rights issues. Redeemable preference shares – Issue and Redemption.	15
2.	Debentures – Issue of debentures – debenture discount and its treatment– Interest on debentures – provision for Redemption of debentures – Sinking fund method – Non-cumulative sinking fund – Insurance policy method – own debentures - Interest on own debentures – Ex-Interest and CumInterest .	20
3.	Profits prior to incorporation —Time ratio & Sales ratio -- Underwriting – liability of underwriter – total and partial underwriting – Firm underwriting. - underwriting commission.	20
4.	Valuation of goodwill – Methods of valuing Goodwill (average profit method, super profit method, capitalization method) - Valuation of equity and preference shares(net assets method, yield value, fair value method).	20
5.	Final Accounts of companies – contents of Final statements – Vertical form of balance sheet(new format) – divisible profits and dividends – Transfer of profits to reserve –computation of maximum amount of dividend payable – guidelines for issue of bonus shares.	15

4. Book for Study
  1. Reddy.T.S & Murthy.A. (2019),"Corporate Accounting", Margham Publications, Chennai.

5. Books for Reference:
 1. Advanced Accounting: Corporate Accounting, Ashok Sehgal & Deepak Sehgal, Taxmann,2017
 2. Corporate Accounting, B.S.Raman, United Publishers, 2017
 3. Advanced Accounting, S.P. Jain & K.L. Narang, Kalyani Publishers, 2017
 4. Advanced Accounting, Dr. Arulanandham & Raman, Himalaya Publishing House Pvt ltd, 2017
 5. Hanif and Mukherjee. (2004), "Modern Accountancy", Tata McGraw Hill Publishing Company Ltd, New Delhi.
 6. 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 I the students will be

CO No.	Statement	Level
CO 1	Familiarise the students with the Basic knowledge in issue and redemption of shares.	K1 & K2
CO 2	Classify and understand the issue and redemption of debentures.	K2
CO 3	Prepare problems of profit prior to incorporation and underwriting	K3
CO 4	Understand the valuation of shares and goodwill.	K3
CO 5	Interpret the problems of final accounts of joint stock companies	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 / 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	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 – I strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class	: I IBCOM Gen	**Part**	: III Core-9
Semester	: IV	**Hours**	: 90
Subject Code	: 22UCOP44	**Credit**	: 04

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1. Title of the Paper: E-COMMERCE

2. Course Objectives (CO)
- In-depth understanding of traditional commerce and e-commerce.
- Impart the knowledge of information technology in ecommerce.
- They can understand the importance of business strategies in e-commerce.
- To know the concept of e-payment methods.
- Develop a perfect understanding on mobile commerce technology.

3. Five units of the Syllabus:

Unit	Content	Hours
1.	Meaning and the concept of e-commerce, History of e-commerce, traditional Commerce Vse-commerce, different types of e-commerce–B2B, B2C, C2C, B2E, G2C	15
2.	Need and role of e-commerce, Multimedia technology, ISDN, ATM, Cell relay, desktop, video conferencing, Information publishing technologies	20
3.	Information and strategies, e-commerce strategy and knowledge management strategy, e business strategy, data ware housing and data mining, Consumer oriented strategies for marketing, sales and eCRM.	20
4.	Introduction to payment system, online payment system, pre paid e-payment service, post paid e-payment system, SET protocols, Operational system, credit and legal risk of e-payment system	20
5.	Growth of mobile commerce, Mobile health services, wireless applications, Technologies for mobile commerce, Wireless datagram protocol (WDP) Mobile commerce and its future in India	15

4. Books for Study:
1. Abirami Devi.K, alagammai.M, 2019, "E-Commerce", Margham Publications, Chennai.

5. Books for Reference:
1. P.T.Joseph, S.J. (2011)," E-Commerce", An Indian Perspective PHI Learning, Fourth Edition, New Delhi.

2. Kenneth C.Laudon, Carol Guerico Traver, (2008), "E-Commerce Business Technology Society", Pearson Prentice Hall, New Jersey.
3. Schneider.G.P. (2015),"E-Commerce", Thomson Publication,11thEdition, Canada.

6. Teaching Learning Methods:

Power Point Presentation, Group Discussion, Quiz, Assignments, etc….

7.Course Outcome(CO):

After Completion of the Course E-Commerce the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Compare the traditional commerce vs E-Commerce and classify Business models	K3
CO2	Discuss the multimedia technology used in e-commerce	K1
CO3	Compare the need of business strategies	K2
CO4	Analyze the payments methods and identify these curity issues	K4
CO5	Able to handle e-commerce technology through mobile phone	K5

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
Grand Total of COs with PSOs and POs														157
Mean Value of COs with PSOs and POs (157/59)														2.66

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 E-Commerce strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class : II BCOM Gen		**Part** : III Core-10
Semester: IV		**Hours** : 90
Subject Code : 22UCOC94		**Credit** : 04

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1. Title of the Paper: BUSINESS MANAGEMENT

2. Course Objectives:

1. Understand the basic concepts of Management and to study the contribution of management expert.
2. Preparation of Planning and its process.
3. Understand the organization structure, staffing and selection.
4. Classify the different style of leadership and motivation.
5. Describe the controlling process and its techniques.

3. Five Units of syllabus:

Unit	Content	Hours
1.	Management: Meaning, Characteristics and Functions–Levels of Management, Different Approaches to the study of Management – Contributions of Henri Fayol, F.W.Taylor and Peter F.Drucker–Management By Objectives(MBO).	**15**
2.	Planning: Importance–Objectives –Process of Planning–Forecasting-Obstacles to Planning.	**20**
3.	Organizing : Nature and Importance – Types of Organization Formal and Informal – Line and Staff – Matrix Organisation - Functional Relationship – Authority and Responsibility – Delegation and Decentralization – Departmentalization – Span of Control – Organization Charts-Staffing & Selection: Staffing-Definition-Elements–Functions-Process of Staffing-Promotion: Meaning-Basics of promotion–Qualities of Good promotion policy.	**20**
4.	Direction: Meaning & Definition–Characteristics–Importance– Principles of Directing–Techniques–Delegation–Supervision– Communication-Orders–Motivation–Leadership.	**20**
5.	Controlling: Meaning & Definition–Characteristics–Control Process–Important Control Techniques.	**15**

4. Books for study:

1. Ramasamy.T.(2018),"Principles of Management", Himalaya Publishing House, Mumbai.

5. Books for References:

1. Peter F.Drucker.(1988), "Practice of Management", Allied Publishers Pvt. Ltd, New Delhi.
2. L.M.Prasad (2009),"Principles and Practice of Management", Sultan Chand and Sons, New Delhi.

6. Teaching Learning methods:

   PPT, Lecture, Test, Assignment

7. Course Outcome (CO):

After Completion of the Course Business Management the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Identify the basic principles and functions of management in Functional are as of business and understand the contributions of experts to management thought.	K1&K2
CO2	Develop the skills in preparation of planning and its process.	K2
CO3	Understand the different type of organization structure, Authority and responsibility and process of staffing.	K2&K3
CO4	Classify the different leadership styles and develop their Leadership capabilities and recognize the significance of motivation in management.	K2&K3
CO5	Define and describe the elements & process of co-ordination and control function that contributes to the achievement of Organizational objectives.	K2&K3

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	2	3	3	3	3	2	2	1	1	-	2	28
CO2	3	3	2	-	3	3	3	2	3	1	1	-	1	25
CO3	3	3	3	3	3	3	3	3	-	2	2	2	-	30
CO4	3	3	2	-	2	3	3	2	2	2	-	-	1	23
CO5	3	3	3	3	3	3	3	2	2	1	-	1	1	28
Grand Total of COs with PSOs and POs														134
Mean Value of COs with PSOs and POs (134/56)														2.39

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			2.39
Observation	COs of Business Management strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMMERCE

Class : II BCOM Gen	**Part : III Allied-4**
Semester: IV	**Hours : 75**
Subject Code: 22UCOA44	**Credits: 04**

1. **Title of the Paper:** BUSINESS STATISTICS
2. **Course Objectives (CO)**
   - In-depth understanding of characteristics and functions of statistics.
   - To know more about data collection.
   - To provide practical exposure on calculation of measure of central tendency of different series and standard deviation.
   - To provide practical knowledge on types of correlation.
   - Enable the students to analyze regression equations.
   - Develop a perfect Understanding on Calculation of various time series and trend analyze.
3. **Five units of the Syllabus:**

UNITS	CONTENT	HOURS
I	Statistics:Meaning-Scope-CharacteristicsandLimitations-Data-SourcesOfData-Methodsofcollection of data- Classification, Tabulation and Presentation of data. Statistical Series-Discrete and Continuous-Formulation of Frequency Distribution.	15
II	Measures of Central Tendency:Arithmetic Mean, Median and Mode, Geometric Mean Harmonic Mean-Weighted Average and their use In computing Average. Standard Deviation.	15
III	Correlation Coefficient of Correlation:Types of Correlation-Scatter diagram-Pearson's Coefficient of correlation-Rank correlation-Concurrent deviation methods	15
IV	Regression: Meaning-Types of regression- correlation and regression-Methods of Regression Analysis	15
V	Analysis of Time series:Meaning and components of time series-Methods of Trend analysis-Semi Averages, Moving Averages, Methods of least square.	15

4. **Books for Study:**
   1.Gupta S.P,(2012),"Statistical Methods", Sultan Chand & Sons, New Delhi.
5. **Books for Reference:**
   1. Pillai R.S.N & Bagavthy, (2012), "Statistics Theory and Practice", Sultan Chand & Sons, New Delhi.

2. Alagar.K., (2014), "Business Statistics", McGraw Hill Education Pvt. Ltd, New Delhi.

6. Teaching Learning Methods:

Power Point Presentation, Group Discussion, Quiz, Assignments, etc….

7. Course Outcome (CO):

After Completion of the Course Business Statistics the students will be

CO No.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Familiarize the concept of statistics and data collection	K2
CO2	Strong knowledge on mean, median, mode and frequency distribution	K1
CO3	Apply the concept of Different methods of Correlation	K3
CO4	Evaluate the regression equations using algebraic and mean method	K5
CO5	Compare types of time series and determine the trend	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	2	3	29
CO2	3	3	2	3	3	3	2	3	-	-	2	2	1	27
CO3	3	3	2	2	-	3	3	-	3	3	-	1	-	23
CO4	3	3	3	3	3	3	2	2	-	-	3	1	2	28
CO5	3	2	-	2	3	3	2	2	3	1	3	-	3	27
Grand Total of COs with PSOs and POs														134
Mean Value of COs with PSOs and POs (134/56)														2.52

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			2.52
Observation	**COs of Business Statistics strongly related with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENTOFCOMMERCE

Class	: II BCOM Gen	Part	: IV NME
Semester	: IV	Hours: 45	
Subject Code	: 22UCON24	Credit: 02	

1.Title of the Paper: E-TAILING

2.Course Objectives (CO)

1. Explain about retailing and electronic retailing
2. Solve their Problems relevant security issues in e-shopping
3. Infer the relevant procedures involved in e-tailing.
4. Relate the benefits of e-tailing over retailing
5. Generalize the trending e-tailers in the virtual market.

3.Five units of the Syllabus:

UNITS	CONTENT	HOURS
I	Retailing:Meaning–characteristics-E-Tailing:Meaning–Origin and Evolution–Characteristics of E-tailing – Retailing vs E-tailing - Opportunities and Challenges of E-tailing –ETailing in India.	9
II	Essentials of E-tailing: Process of e-tailing – Security issues in e-tailing – Steps to overcome the security issues.	9
III	E-tailing procedure: Step by step procedure - e-tailing strategies - Shortcomings of e-tailing –factors contributing to success sin e-tailing.	9
IV	Successful e-tailers: Customer relationship building, Market expansion and Product Planning –Infrastructure of E-tailing companies–Top 10 e-tailers in India.	9
V	Brand imageine-tailing:Product and brand comparison–Customer service–Future of etailing.	9

4. Text Book:

1. Mickey Kosloski, Sharon R.Davis. Retailing and E-tailing, Goodheart Willcox publications, First Edition,Text Edition,2014

5.Reference Books:

1. Bernadette Tiernan, E-tailing, Dearborn Company, Chicago, 2000
2. Samant Yuvraj.The Rise of E-Tailing in India, LAP Lambert Academic Publishing, 2013
3. Ramesh Mittal, Ruchi Nayyar, S.L.Gupta. Retailing and E-Tailing Paperback– 2011.

6.TeachingLearningMethods:

PowerPointPresentation,GroupDiscussion,Quiz,Assignments,etc….

7. Course Outcome (CO):

After Completion of the Course E – Tailing the students will be

CONo.	Statement	KNOWLEDGE LEVEL (Bloom's Taxonomy)
CO1	Familiarise the concept of e-tailing.	K1
CO2	Getting an exposure of e-tailing procedure.	K2
CO3	Identify the brand image in e-tailing.	K2 &K3
CO4	Learn online payment system and internet security issues	K3
CO5	Explore the successful e-tailers and e-tailing companies.	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	2	3	29
CO2	3	3	2	3	3	3	2	3	-	-	2	2	1	27
CO3	3	3	2	2	-	3	3	-	3	3	-	1	-	23
CO4	3	3	3	3	3	3	2	2	-	-	3	1	2	28
CO5	3	2	-	2	3	3	2	2	3	1	3	-	3	27
Grand Total of COs with PSOs and POs														**134**
Mean Value of COs with PSOs and POs (134/56)														**2.52**

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			2.52
Observation	COs of E – Tailing strongly related with PSOs and Pos		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENTOF COMMERCE

Class	: II B.Com Gen	Part	: SBE
Semester	: IV	Hours	: 45
Subject Code	: 22UCOS24	Credits: 02	

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1.   **Title of the Paper: ENTREPRENEURSHIP DEVELOPMENT**

2.   **Course Objectives (CO):**
   1. Understand the concept of Entrepreneur and their functions and importance.
   2. Gain a comprehensive knowledge on women entrepreneurship.
   3. Identify the policy support to micro, small and medium enterprises.
   4. Enable to prepare a project report.
   5. To create awareness on start ups.

3.   **Five Units of Syllabus:**

UNITS	CONTENT	HOURS
I	**Entrepreneurship:** Introduction –Entrepreneur- Characteristics- Functions–Types–Motivating factors to become entrepreneur-entrepreneur and economic development – Phases of entrepreneurship development –Factors affecting entrepreneurship Growth–Theories of entrepreneurship.	9
II	**Women Entrepreneur:** Introduction–Types–Scope–Factors influencing women entrepreneur– Institution supporting women entrepreneurship development–Women entrepreneur in india–Problems of Women entrepreneur–Remedial measures.	9
III	**Micro, Small and Medium Enterprises:** Concept of small scale industry – Importance – Policy support to small scale industry–Apply for registration, term loan, subsidy, Government clearance of MSME-Problems of small scale industry.	9
IV	**Project Report:** Introduction– Project lift cycle–Project indentification–Components of project report–Planning commission and guidelines–Importance of project report–Precautions in preparing a project report –Reasons for the failure of a project report–Model project treport.	9
V	**Start-Ups:** Introduction–Initiatives by government–Mentors–Accelerators–Incubators–sources of finance for start-ups–Failure of start-up–Strategies for Success of start-ups–Innovations in India.	9

4.Book for Study

1.E.Gordon & K.Natarajan, Entrepreneurship Development Himalaya Publishing House, New Delhi.

5.Books for Reference

1. ChhabraT.N.; Business Organisation & Management, Sun India Publications, New Delhi.
2. Shankar, Gauri; Modern Business Organisation, Mahavir Book Depot, New Delhi.

6.Teaching Learning Methods

Power Point Presentation, Group Discussion, Quiz, Assignments, etc....

7.Course Outcome (CO)

After Completion of the Course Entrepreneurship Development the students will be

Sl. No.	Course Outcome	Knowledge Level
CO1	Familiarise the students with the concept of entrepreneurship.	K1&K2
CO2	Discuss the problems faced by women entrepreneurship.	K2
CO3	Enumerate the policy support to micro, small and medium enterprises.	K3
CO4	Enhance to make a project report.	K5
CO5	Enable to start a new business.	K5

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		2	1	28
CO3	3	3	2	2	3	3	3	2	2	3	2	1	-	29
CO4	3	2	3	3	1	3	3	3	2	2	3	-	1	29
CO5	3	3	3	2	2	3	3	2	3	2	-	2	1	29
Grand Total of COs with PSOs and POs														142
Mean Value of COs with PSOs and POs(142/59)														2.40

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
Meanvalue of COs with PSOs and Pos			2.40
Observation	COs of Entrepreneurship Development-strongly related with PSOs and POs		

DEPARTMENT OF
BUSINESS ADMINISTRATION

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

CBCS STRUCTURE for BBA

Part	Sub.Code	PAPER	Hrs	Cr
I SEMESTER				
I	19UTAL11/ 19UHNL11/ 19USNL11	Tamil/ Hindi/ French	05	04
II	19UENB11	English through Prose & Short Story – Stream B	05	04
III	19UBAC11	Core – 1 Management Thought and Process	06	05
	19UBAC21	Core – 2 Office Administration	06	05
	19UBAA11	**Allied – 1** Accounting for Managers	**05**	**04**
IV	19UFCE11	Foundation Course – Personality Development	01	01
	19UCSH12	Communication Skills	01	-
	19USSI16	Soft Skills	01	-
V	19UNCC/NSS/ PHY.EDU./YRC /ROT/ACF/ NCB12	Extension Activities NCC /NSS /PHY.EDN. / YRC/ROTARACT / AICUF / Nature Club	-	-
	19UBRC11	Bridge Course	-	01
		Total	**30**	**24**
II SEMESTER				
I	19UTAL22/ 19UHNL22/ 19USNL22	Tamil/ Hindi / French	05	04
II	19UENB22	English through Prose & Short Story – Stream B	05	04
	19UBAC32	Core – 3 Business Environmental Management	06	05
	19UBAC42	Core – 4 Entrepreneurship Development	06	04
	19UBAA22	**Allied – 2** Introduction to Statistics	05	04
IV	19UFCH22	FC – Social Responsibility and Global Citizenship	01	01
	19UCSH12	Communication Skills	01	1
	19USSI16i	Soft Skills	01	-
V	19UNCC/NSS/ PHY.EDU./ YRC/ROT/ACF/ NCB12	Extension Activities NCC /NSS /PHY.EDN. / YRC/ROTARACT / AICUF / Nature Club	-	01
		Total	**30**	**24**
III SEMESTER				
III	19UBAC53	Core – 5 Organisational Behaviour	06	05
	19UBAC63	Core – 6 Company Organisation	06	04
	19UBAC73	Core – 7 Principles of Marketing	05	04
	19UBAA33	**Allied – 3** Business Mathematics	**05**	**04**

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IV	19UBAN13	(To choose any 1 out of 3) Basic Tamil/Advanced Tamil/Non-major Elective – 1.Introduction to Marketing Management 2. Introduction to Organisational Behaviour 3. Introduction to Tourism Management	03	02
	19UBAS13	(To choose any 1 out of 3) Skill Based Elective – 1 1. Executive Communication – 1 2. Time Management 3. Creativity and Innovation Management	03	02
	19UFCE33	F C – Environmental Studies	01	01
V	19UNCC/NSS/ PHY.EDU./ YRC/ROT/ACF/ NCB24	Extension Activities NCC /NSS /PHY.EDN. / YRC/ROTARACT / AICUF / NATURE CLUB	--	--
	19UARE14	ARISE	--	--
	19USSI16	Soft Skills	01	-
		Total	**30**	**22**

		IV SEMESTER		
III	19UBAC84	Core - 8 Human Resource Management	06	05
	19UBAC94	Core – 9 Managerial Economics	06	04
	19UBAD04	Core - 10 Legal Aspects of Business	05	04
	19UBAA44	**Allied – 4** Operations Research	05	04
IV	19UBAN24	(To choose any 1 out of 3) Basic Tamil/Advanced Tamil/Non-Major Elective – 1. Essentials of Leadership 2. Introduction to Rural Marketing 3. E-Business	03	02
	19UBAS24	(To choose any 1 out of 3) **Skill Based Elective 2** – 1. Executive Communication – 2 2. Digital Marketing 3. Business Case Analysis	03	02
	19UFCH44	F C –Religious Literacy and Peace Ethics	01	01
V	19UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/ NCB24	Extension Activities NCC /NSS/Phy.Edn. / YRC/ROTARACT / AICUF / Nature Club	-	01
	19UARE14	ARISE	-	01
	19USSI16	Soft Skills	01	-
		Total	**30**	**24**

		V SEMESTER		
III	19UBAD15	Core - 11 Introductions to Operations Management	06	05
	19UBAD25	Core - 12 Services Marketing	05	05
	19UBAD35	Core - 13 Business Research Methods	05	04
	19UBAD45	Core - 14 Financial Management	05	03
	19UBAD55	Core - 15 Institutional Training & Viva - Voce	04	04
IV	19UBAE15	**(To choose any 1 out of 3)** Core Elective – 1 1. Computer Application in Business 2. ICT Skills 3. Digital and Social Media Marketing	04	03
	19UINT15	Internship on Industrial Exposure & Viva – Voce	-	1
	19USSI16	Soft Skills	01	-
		Total	**30**	**25**
		VI SEMESTER		
III	19UBAD66	Core- 16 Modern Sales Management	06	05
	19UBAD76	Core - 17 Export Documentation & Procedure	05	04
	19UBAD86	Core – 18 Advertising Management	05	04
	19UBAD96	Core – 19 Business Policy & Strategic Management	05	04
	19UBAT06	Core – 20 Field Study Research Report & Viva – Voce	04	03
IV	19UBAE26	**(To choose any 1 out of 3)** Core Elective – 2 1. Financial Accounting Package using Tally 2. Business Ethics 3. Customer Relationship Management	04	03
	19USSI16	Soft Skills	01	02
		Total	**30**	**25**

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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
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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	19UBASL3	Body Language	03
IV	19UBASL4	Group Discussion	03
V	19UBASL5	Stress management	03
VI	19UBASL6	Business Etiquette	03

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
ORGANIZATIONAL BEHAVIOUR

Template for Course Syllabus

Title (Core-5)	ORGANIZATIONAL BEHAVIOUR	Course Code	19UBAC53
Class	**II BUSINESS ADMINISTRATION**	Hours	**90**
Semester	**III**	Credit	**05**
Course Educational Objectives(CEO)	1. Introduce the fundamentals of organizational behaviour 2. Explore the concepts of individual behaviour 3. Give an idea about the behavioral aspects of group in an organization 4. Exhibit the concepts of organizational conflict and stress management 5. Analyze the organizational change and its development		

Unit	Content	No. of Hours
I	**Fundamentals of Organizational Behaviour** Organisational Behaviour – Definition – Nature and Scope – Need – Process - Models.	18
II	**Individual behaviour** Individual Behaviour – Personality – Concept – Determinants – Theories – Perception – Meaning – Perpetual Process – Factors affecting Perception	18
III	**Group Behaviour** Group behavior – Definition – Characteristics – Types – Theories - Stages of group formation – Group norms – Group cohesion –Group decision making.	18
IV	**Organizational conflict and Stress management** Organisational conflicts – definition – sources – Types – Aspects – Conflict process – Conflict management – stress management – symptoms – measurement – sources- consequences – managing stress.	18
V	**Organisational change and Development** Organisational Change - Meaning – Forces – Types – Resistance – Overcoming resistance to change – Organisational Development – meaning – Objectives – Models – Factors affecting change.	18

Books for Study	1. S.S.Khanka, *Organizational behavior* – Chennai McMillan, 2012.
Books for Reference	1. Gupta K.Joshy Rosy, *Organizational Behavior* – Kalyani Publishing House, 2010. 2. Suja R.Nair, *Organizational Behavior* – Himalaya Publications – Mumbai, 2009. 3. Robbins.S, *Organisational Behaviour* - Prentice-Hall, India, 2011.

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

CO 1	Retrieve knowledge on basis of organizational behaviour	K1
CO 2	Interpret the concepts of individual behaviour	K2
CO 3	Apply the concepts of group behaviour in an organization	K3
CO 4	Analyse organizational conflict and stress management	K4
CO 5	Examine organizational change and development	K4

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	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
CO4	3	3	3		3	3	3	3	3	3	3			30
CO5	3	3	3		3	3	3	3	3	3	3			30
Grand Total of COs with PSOs and POs														150
Mean Value of COs with PSOs and POs = 150/50														3

*: 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			3
Observation	**COs of Organisational Behaviour – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

COMPANY ORGANISATION

Template for Course Syllabus

Title (Core – 6)	**COMPANY ORGANISATION**	Course Code	19UBAC63
Class	**II BBA**	Hours	**90**
Semester	**III**	Credit	**04**
Cognitive Level	**K-1** Knowledge **K-2** Understanding **K-3** Application **K-4** Analysis **K-5** Evaluation		
Course Educational Objectives(CEO)	1. Familiarize the students with the regularity frame work for formation and incorporation of a company as per Indian companies act. 2. Depth knowledge about the rights and duties of board of management 3. Impose the knowledge about the various meetings of the company. 4. Provisions available to handle mismanagement 5. Clarify procedures of company's merger and dissolution.		

Unit	Content	No. of Hours
I	**Fundamentals of company** Definition of company – Features - kinds of Companies – Company formation - Memorandum and articles of association – Prospectus.	18
II	**Management and Administration of company** Board of Directors, Managing Director – Appointment – Rights, Duties and Liabilities – Secretary and Auditor – Appointment – Rights, duties and liabilities.	18
III	**Company Meetings** Company meeting kinds – Notice of meeting – Quorum Minutes, Proxies - Resolution	18
IV	**Prevention of Mismanagement** Prevention of oppression and Mismanagement – Powers of NCLT – Powers of Government.	18
V	**Amalgamation and Winding up** Merger and Demerger of a company – Amalgamation - Winding up of companies – Reasons – Modes of Winding up.	18
Books for Study	1. N.D.Kapoor, *Elements of Company Law* – Sulthan Chand & Sons – New Delhi, 2021.	
Books for	1. Gogna P.P.S, Text book of company law –Chand and Company Limited –	

Reference	New Delhi, 2016.
	2. Gulshan S.S and Kapoor G.K, *Business Law including Company Law* – Sulthan Chand & Sons, 2020.
	3. Jain N.K, *Company Law and company law practices* – Deep and Deep Publications – New Delhi, 2020.

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

CO 1	Familiarize about starting a new venture.	K1
CO 2	Understand the rights and duties of board of management	K2
CO 3	Familiarize company's meetings and its procedure	K2
CO 4	Recognize the provisions available to handle mismanagement	K3
CO 5	Undertake procedures during winding up stage.	K3

Mapping Course Outcome

ObJectives Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	Level*	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Level*
CO1				3								3				
CO2				3							3					
CO3			1				M									M
CO4		3						2								
CO5					2								3			

*: S-Strong; M-Medium; L-Low

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

PRINCIPLES OF MARKETING

Template for Course Syllabus

Title (Core – 7)	**PRINCIPLES OF MARKETING**	Course Code	
Class	**II BUSINESS ADMINISTRATION**	Hours	**75**
Semester	**III**	Credit	**04**
Course Educational Objectives(CEO)	1. Introduce the basic concepts of marketing and recent trends in marketing. 2. Discuss about the new product development 3. Exhibit the methods of pricing 4. Inculcate the channels of distribution 5. Formulate best advertising strategy and sales promotion tactics		

Unit	Content	No. of Hours
I	**Fundamentals of Marketing** Marketing management - Nature, scope of Marketing- Role – Concepts – Marketing mix – Consumer Behaviour – Buying motives – Consumer Decision making – Recent trends in marketing	15
II	**Product Mix** Product – Product Classification – Product planning and policies – New Product Development – Branding and packaging – Product life cycle.	15
III	**Pricing** Pricing – Methods of price determination – Cost oriented pricing – Demand oriented pricing, - competitive pricing – New product pricing – Product line pricing – Geographical pricing – Psychological pricing.	15
IV	**Channel of Distribution** Channel of distribution – channel functions – Factors to be considered in channel selection – Wholesaling and Retailing.	15
V	**Promotions** Advertising – Objectives –type of advertising – Sales promotion – Types of sales promotion– Publicity – Public relations.	15

Books for Study	1. Ramasamy and Namakumari, *Marketing Management* - Macmillan Publications, 2019
Books for Reference	1. Philip Kotler, *Marketing Management* - Prentice Hall, 2018. 2. Pillai.R.S.N, *Modern Marketing And Principles And Practices Of Marketing* Sultan, Chand and Sons, 2017.

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

CO 1	Explain basic concepts in marketing management.	K3
CO 2	Illustrate new product development.	K3
CO 3	Determine pricing strategies	K3
CO 4	Differentiate wholesaling and retailing concepts.	K3
CO 5	Describe various kinds of media for advertising	K2

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		3	3	3			27
CO2	3	3	3		3	3	3		3	3	3			27
CO3	3	3	3		3	3	3		3	3	3			27
CO4	3	3	3		3	3	3		3	3	3			27
CO5	3	3	3		3	3	3		3	3	3			27
Grand Total of COs with PSOs and POs														135
Mean Value of COs with PSOs and POs = 135/45														3

*: 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			3
Observation	**COs of Marketing Management – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

BUSINESS MATHEMATICS

Template for Course Syllabus

Title(Allied – 3)	**BUSINESS MATHEMATICS**	Course Code	
Class	**II BUSINESS ADMINISTRATION**	Hours	**75**
Semester	**III**	Credit	**04**
Course Educational Objectives(CEO)	1. Acquire knowledge on set and its application in business decision making. 2. Knowledge about Matrices and its applications 3. Introduce geometry and breakeven point analysis 4. Familiarize commercial arithmetic problems in the business field 5. Discuss basic differential calculus and its rules.		

Unit	Content	No. of Hours
I	**Sets:** Representation of sets, Equal sets, finite and infinite sets, sub-sets, universal sets, Venn diagrams, set operations.	15
II	**Matrices:** Basic concepts – types - Solving a system of Linear equation using Matrix inversion - Rank of Matrix.	15
III	**Analytical Geometry:** Distance between two points, Equation of straight line (slope – Intercept form, Slope – Point form – Two Point form). Intersection of two lines – Equation Parallel line, Perpendicular line – Break Even Analysis.	15
IV	**Arithmetic Mathematics** Percentages – Simple Interest – Compound interest – Pay roll – Wages - Commission	15
V	**Differential calculus** Differential calculus – Rules - Sum Rule – Product rule - Quotient rule – simple applications of differentiation to commerce and economics	15
Book for Study	1. Jayaseelan and Sundaresan, *Business Mathematics* - S.Chand & Company, 2020.	
Books for Reference	1. J.K.Sharma, *Business Mathematics Theory and Applications* - One Books, India, 2016. 2. Dr.Harbons Lal, *Business Mathematics for C.A (P.E.-1)* – Sulthan Chand, 2015. 3. Qasi Zameeruddin V.K.Khanna S.K.Bhambri, *Business Mathematics* – Vikas publishing House Pvt.Ltd, 2018.	

Teaching and learning methods
- Class Lecture
- Group Discussion
- ICT (Information communication Technology)

Course Outcome (CO)

On successful completion of the course, the student able to

CO 1	Illustrate set and its application in business decision making.	K3
CO 2	Solve Matrices and its applications	K3
CO 3	Apply analytical geometry and breakeven point analysis	K3
CO 4	Compute commercial arithmetic problems in the business field	K3
CO 5	Determine differential calculus and its rules.	K3

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	2			17
CO2	3		3			3	3			3	2			17
CO3	3		3			3	3			3	2			17
CO4	3		3			3	3			3	2			17
CO5	3		3			3	3			3	2			17
Grand Total of COs with PSOs and POs														85
Mean Value of COs with PSOs and POs = 85/30														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	**COs of Business Mathematics – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

INTRODUCTION TO MARKETING MANAGEMENT

Template for Course Syllabus

Title(NME – 1)	**INTRODUCTION TO MARKETING MANAGEMENT**	Course Code	
Class	**II BUSINESS ADMINISTRATION**	Hours	**45**
Semester	**III**	Credit	**02**
Course Educational Objectives(CEO)	1. Introduce the basic concepts of marketing and recent trends in marketing. 2. Discuss about the new product development 3. Exhibit the methods of pricing 4. Inculcate the channels of distribution 5. Formulate best advertising strategy and sales promotion tactics		
Unit	**Content**	**No. of Hours**	
I	**Fundamentals of Marketing** Nature and scope of Marketing- Concepts of marketing – Marketing Mix, Consumer Behaviour – Consumer Decision making	09	
II	**Product Mix** Product – Product Classification – New Product Development – Branding and packaging – Product life cycle.	09	
III	**Pricing** Pricing – Methods of price determination – Cost oriented pricing – Demand oriented pricing, - competitive pricing – New product pricing.	09	
IV	**Channel of Distribution** Channel of distribution – channel functions – Factors to be considered in channel selection – Retailing and wholesaling.	09	
V	**Promotions Decisions** Promotion Mix – Advertising – Personal Selling – Sales promotion : Tools , Techniques - Publicity – Public Relations	09	
Book for Study	1.Ramasamy and Namakumari, *Marketing Management* - Macmillan publications, 2019.		
Books for	1. Philip Kotler, *Marketing Management* - Prentice Hall, 2018.		

Reference	2. Pillai.R.S.N. *Modern marketing and principles and practices of marketing -* Sultan Chand & Sons, 2020.

Teaching and learning methods
- Class Lecture
- Video Lecture
- Group Discussion
- ICT (Information communication Technology)

Course Outcome (CO)
On successful completion of the course, the student able to

CO 1	Explain basic concepts in marketing management.	**K3**
CO 2	Illustrate new product development.	**K3**
CO 3	Determine pricing strategies	**K3**
CO 4	Differentiate wholesaling and retailing concepts.	**K3**
CO 5	Describe various kinds of media for advertising	**K2**

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		3	3	3			27
CO2	3	3	3		3	3	3		3	3	3			27
CO3	3	3	3		3	3	3		3	3	3			27
CO4	3	3	3		3	3	3		3	3	3			27
CO5	3	3	3		3	3	3		3	3	3			27
Grand Total of COs with PSOs and POs														135
Mean Value of Cos with PSOs and POs = 135/45														3

*: 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			3
Observation	**COs of Introduction to Marketing Management – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

INTRODUCTION TO ORGANIZATIONAL BEHAVIOUR

Template for Course Syllabus

Title (NME 1)		**INTRODUCTION TO ORGANIZATIONAL BEHAVIOUR**	Course Code	
Class		**II BUSINESS ADMINISTRATION**	Hours	**45**
Semester		**III**	Credit	**02**
Course Educational Objectives(CEO)		1. Introduce the fundamentals of organizational behaviour 2. Explore the concepts of individual behaviour 3. Give an idea about the behavioral aspects of group in an organization 4. Exhibit the concepts of organizational conflict and stress management 5. Analyze the organizational change and its development		
Unit	**Content**			**No. of Hours**
I	**Fundamentals of Organizational Behaviour** Organisational Behaviour – Definition – Nature and Scope – Need – Process - Models.			9
II	**Individual behaviour** Individual Behaviour – Personality –Determinants – Perception– Perpetual Process – Factors affecting Perception			9
III	**Group Behaviour** Group behavior –Characteristics – Types – Stages of group formation – Group norms			9
IV	**Organizational conflict** Organisational conflicts –sources – Types –Conflict process – Conflict management –			9
V	**Organisational change and Development** Organisational Change - Meaning –Types – Resistance – Overcoming resistance to change – Organisational Development –Objectives – Factors affecting change.			9
Books for Study	1. S.S.Khanka, *Organizational behavior* – Chennai McMillan, 2020.			
Books for Reference	1. Gupta K.Joshy Rosy, *Organizational Behavior* – Kalyani Publishing House, 2019. 2. SujaR.Nair, *Organizational Behavior* – Himalaya Publications – Mumbai, 2018. 3. Robbins.S, *Organisational Behaviour* - Prentice-Hall, India, 2017.			

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

CO 1	Retrieve knowledge on basis of organizational behaviour	K1
CO 2	Interpret the concepts of individual behaviour	K2
CO 3	Apply the concepts of group behaviour in an organization	K3
CO 4	Analyse organizational conflict	K4
CO 5	Examine organizational change and development	K4

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	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
CO4	3	3	3		3	3	3	3	3	3	3			30
CO5	3	3	3		3	3	3	3	3	3	3			30
Grand Total of COs with PSOs and POs														150
Mean Value of COs with PSOs and POs = 150/50														3

*: 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			3
Observation	**COs of Organisational Behaviour – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

INTRODUCTION TO TOURISM MANAGEMENT

Template for Course Syllabus

Title (NME 1)	**INTRODUCTION TO TOURISM MANAGEMENT**	Course Code	
Class	**II BUSINESS ADMINISTRATION**	Hours	**45**
Semester	**III**	Credit	**02**
Course Educational Objectives(CEO)	1. Impart the functions of tourism management. 2. Reveal the importance of marketing research and segmentation. 3. Illustrate the passenger Transport system. 4. Inculcate the travel agency operations. 5. Explore the functions of travel agencies.		
Unit	**Content**	**No. of Hours**	
I	**Introduction to Tourism Management** Tourism management Need for marketing in tourism, defining tourism marketing, the tourist product, special features of tourism marketing, marketing process,	09	
II	**Marketing research and segmentation** marketing research, market segmentation market targeting, tourism promotion, advertising, public relations, public relation technique	09	
III	**Passenger transport** Prime force in expansion of tourism, High speed trains, Cruise liners, Air transport, Commercial traffic, Ocean transport, Indian Railways: Past, Present, future, Types of tours available in India, Indrail Pass	09	
IV	**Travel agency operations** Thomas cook, American express, Cox & Kings / TCI, Scope & role of retailers, modern travel agencies, travel organization, handling a client -WATA guidelines, your relation with service suppliers	09	
V	**Travel agency appointments** International air transport association (IATA), Trade association activities, Traffic conferences & activities, IATA allied services, IATA accreditation for travel agency, IATA controlled approval, International regulations, Indian association of tour operator,	09	

Book for Study	1. Stephen J.Page – Tourism Management – S.Chand & Company Ltd - 2018
Books for Reference	1. Abu Barkat Ali – Travel and Tourism Management – PHI Learning – 2017 2. Vrk Rakesh – Shaifalee – Tourism and Travel Management – UDH publishers - 2020

Teaching and learning methods

- Class Lecture
- Video Lecture
- Group Discussion
- ICT (Information communication Technology)

Course Outcome (CO)

On successful completion of the course, the student able to

CO 1	Retrieve functions of tourism management	K 1
CO 2	State and apply marketing research	K3
CO 3	Illustrate the passenger transport system	K3
CO 4	Summarise the operations of travel agencies	K2
CO 5	Describe the travel agencies	K2

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	3	3		3				27
CO2	3	3	3	3	3	3	3	3		3				27
CO3	3	3	3	3	3	3	3	3		3				27
CO4	3	3	3	3	3	3	3	3		3				27
CO5	3	3	3	3	3	3	3	3		3				27
Grand Total of COs with PSOs and Pos														135
Mean Value of COs with PSOs and POs = 135/45														3

*: 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			3
Observation	**COs of Introduction to Office Management – Strongly related with PSOs and Pos**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
EXECUTIVE COMMUNICATION – I

Title (SBE – 1)	**EXECUTIVE COMMUNICATION – I**	Course Code	19UBAS13
Class	**II BUSINESS ADMINISTRATION**	Hours	**45**
Semester	**III**	Credit	**02**
Course Educational Objectives(CEO)	1. Introduce the different types of business communication 2. Discuss the various forms of letter writing 3. Explore the types of letters. 4. Exhibit the concepts of bank and insurance correspondence 5. Analyze the recent trends in modern communication.		

Unit	Content	No. of Hours
I	**Basic elements of communication** Business Communication – Objectives – Importance – Types of communication – Process of communication - Barriers of communication.	9
II	**Oral communication** Effective Oral communication, characteristics, methods, conversation skills, Speaking skills.	9
III	**Letter writing** Principles of letter writing – structure and layout of letters – Do's and Don'ts of letter. Writing Job application letters – sales letters – Quotations and Orders	9
IV	**Enquiries and references** Status enquiries – Trade and bank references and insurance correspondence.	9
V	**Recent trends in public correspondence** Correspondence with public authorities - Modern communications – Modern Electronic communication system.	9
Books for Study	1. Rajendra Pal and J.S.Kolahalli, Essentials of Business Communications – Sultan and Sons, 2018.	
Books for Reference	1. Mohan & Sharma, Business Correspondence – TATA McGrew Hill, 2019. 2. Pillai. R.S.N and Bagavathy Norman Lewis – Commercial Correspondence And Office Management – Goyal Publication – 2019. 3. Sharma R.C Mohanakrishna, Business Correspondence and Report Writing – TATA McGrew Hill Publication, 2018.	

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

CO 1	Retrieve knowledge on communication skills.	K1
CO 2	Illustrate business Letter Writing skills	K3
CO 3	Apply knowledge to write sales letters, quotations, orders and tenders.	K3
CO 4	Apply knowledge to write bank and insurance correspondence.	K3
CO 5	Explain the functions of Modern communication.	K3

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		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 = 105/45														2.3

*: 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			2.3
Observation	**COs of Introduction to Executive Communication I – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
TIME MANAGEMENT

Template for Course Syllabus

Title (SBE I)	**TIME MANAGEMENT**	Course Code	
Class	**II BBA**	Hours	45
Semester	**III**	Credit	02
Cognitive Level	**K-1** Knowledge **K-2** Understanding **K-3** Application **K-4** Analysis **K-5** Evaluation		
Course Educational Objectives(CEO)	1. Introduce the basic principles of Time management. 2. Exhibit the concept of goal setting and prioritization. 3. Discusselements of effective time management. 4. Inculcate steps to plan time management. 5. Discuss the importance of time management at workplace.		

Unit	Content		No. of Hours
I	**Introduction to Time Management** Meaning – Objectives of Time management – Importance - Misconceptions about time – Symptoms of Poor time management.		9
II	**Goal setting and Prioritization** Goal setting – Categories of Goals – SMART goals – Prioritizing using Time Management Matrix.		9
III	**Effective time management** Time Analysis-Keeping track of time using time log – analyzing time log –time spent/invested patterns.		9
IV	**Planning for time management** Essential Steps in Using A Planner - Daily, weekly and long range planning –Using technology to save time.		9
V	**Time management at workplace** Workplace and paper organizers - making meetings effective – Managing information overload.		9
Books for Study	1. Time Management for Busy People", Roberta Roesch, McGraw-Hill Publishing, 2019.		
Books for Reference	1. Essence of Time Management: Principles and Practice", Micheal Labe of, Jaico Publishing House, 2016. 2. "Make Everything Count", Robert W. Bly; Jaico Publication House, 2016.		

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

CO 1	Familiar with basic concepts in Time management.	K2
CO 2	Make effective Goal setting and Prioritization.	K4
CO 3	Gain knowledge of Effective time management.	K2
CO 4	Gain knowledge on planning for time management.	K4
CO 5	Gain knowledge on Time management at work place	K5

Mapping Course Outcome

Objectives Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Level *	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Level *
CO1	3						3	2							
CO2		2							3						
CO3			3		3							3			M
CO4				1											
CO5				3	3				2			1			

*: S-Strong; M-Medium; L-Low

Template for Course Syllabus

Title (SBE I)	**CREATIVITY AND INNOVATION MANAGEMENT**	Course Code	
Class	I BBA	Hours	45
Semester	Even semester	Credit	02
Cognitive Level	**K-1** Knowledge **K-2** Understanding **K-3** Application **K-4** Analysis **K-5** Evaluation		
Course Educational Objectives(CEO)	1. Introduce the basic principles of Creativity 2. Introduce the basic principles of innovation 3. Discuss logical thinking and models of Innovation. 4. Inculcate Idea Generation Techniques and Brain storming. 5. Discuss the application of creativity thinking process.		

Unit	Content	No. of Hours
I	**Creativity and Introduction** What is Creativity – Individual and Group Creativity – Convergent Thinking – Divergent Thinking and Generation of Creative Ideas - Thinking Hats Methods	9
II	**Innovation** Concept of Innovation – Need for innovation – Ways to innovate – Innovation opportunities Corporate Innovation Process-Integrated Strategic Planning for Innovation	9
III	**Logical Thinking and Models of Innovation** Intuition- Logical Thinking-Heuristics and models-Tools that prepare the mind for creative thought – Levels of model of innovation – Model of innovation - Industrial design.	9
IV	**Idea Generation** Idea generating techniques-Brainstorming – Lateral thinking - Synectic-Nominal groups Quality Circles-Suggestion Systems-Attribute listing- Redefinition technique-Randomstimulus-Thinking Hats-Idea sensitive area-Ishikawa diagram-Principles behind techniques.	9
V	**Application of creativity** Developing and applying creativity-Designing Creative Society and Organization-Creativity Training-Applications: Process Redesign-Reengineering-Creative bench marking.	9
Text book	1.Shlomo Maital and D V R Seshadri, Innovation Management: Strategies, Concepts and Tools for Growth and Profit, response books, New Delhi. 2020.	

Books for Reference	1. Margaret A. White, Garry D. Bruton, The Management of Technology and Innovation: A Strategic Approach, Cengage Learning, Mumbai, 2019. 2. Paul E. Plsek, Creativity, Innovation, and Quality, Quality Press, New Delhi, 2016.

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

CO 1	Familiar with basic concepts in Creativity	**K2**
CO 2	Familiar with basic concepts in Innovation	**K4**
CO 3	Gain knowledge ofLogical Thinking and Models of Innovation.	**K2**
CO 4	Gain knowledge on Idea generation and Brain storming techniques	**K4**
CO 5	Gain knowledge on Applying creativity and innovation techniques in business	**K5**

Mapping Course Outcome

Objectives / Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Level *	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Level *
CO1	3						3	2							
CO2		2							3						
CO3			3		3							3			M
CO4				1											
CO5				3	3				2			1			

*: S-Strong; M-Medium; L-Low

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
HUMAN RESOURCE MANAGEMENT

Template for Course Syllabus

Title (Core – 8)	**HUMAN RESOURCE MANAGEMENT**	Course Code	19UBAC84
Class	**II BBA**	Hours	**90**
Semester	**IV**	Credit	**05**
Cognitive Level	**K-1** Knowledge **K-2** Understanding **K-3** Application **K-4** Analysis **K-5** Evaluation		
Course Educational Objectives(CEO)	1. Introduce the basic principles and functions of human resource management. 2. Exhibit HR planning, recruitment and selection functions. 3. Discuss Employee Training and Executive development methods. 4. Inculcate trade union functions, grievance management procedures and employee motivation. 5. Discuss the Industrial relations and Collective bargaining.		

Unit	Content	No. of Hours
I	**Introduction to HRM** Human Resource Management – Definition – Concepts – Objectives – Functions- Nature of HRM – Scope of HRM- Role and Qualities of HR Manager – Types of Organization.	18
II	**HR Planning, Recruitment and Selection** Human Resource Planning, Factors Influencing HRP – Job Analysis – Methods – Recruitment – Sources – Selection – Tests – Interviews – Orientation.	18
III	**Human Resource Development** Training and Development – methods – Executive Development – Methods – Performance Appraisals – Types – Promotions and transfers.	18
IV	**Grievance Management and Motivation** Employee grievances – Grievance handling systems – Negotiations – Solutions – Grievance redressal procedures – Employee motivation – Theories of motivation – Maslow – Herzberg – X & Y theory.	18

V	**Industrial relations and collective bargaining** Industrial Relations – Causes of poor IR – Trade unions – managing Conflicts – Collective bargaining – Worker's participation in Management.	18
Books for Study	1.K.Aswathappa, Human Resource management, TATA McGraw Hill, New Delhi, 2021.	
Books for Reference	1. J.Jeyasankar, Human Resource Management, Margham Publication, Chennai, 2019. 2. Bhaskaran Chatterjee, Human Resource Management, Sterling Publisher, New Delhi, 2016. 3. Cynthia D, Personnel Management, Chennai all India Publishers, Chennai, 2020.	

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

CO 1	Familiar with basic concepts in human resource management.	K2
CO 2	Make effective human resources planning, recruitment and selection functions.	K4
CO 3	Gain knowledge of Human Resource Developmental activities	K2
CO 4	Gain knowledge on trade union functions, grievance management procedures and employee motivation	K4
CO 5	Gain knowledge Industrial relations and Collective bargaining	K5

Mapping Course Outcome

Objectives Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Level*	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Level*
CO1	3						3	2							
CO2		2							3						
CO3			3		3							3			M
CO4				1											
CO5				3	3				2			1			

*: S-Strong; M-Medium; L-Low

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ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
MANAGERIAL ECONOMICS

Template for Course Syllabus

Title (Core – 9)	**MANAGERIAL ECONOMICS**	Course Code	19UBAC94
Class	**II BUSINESS ADMINISTRATION**	Hours	**90**
Semester	**IV**	Credit	**04**
Course Educational Objectives (CEO)	1. Introduce the basics of business economics 2. Discuss the demand and forecasting techniques. 3. Explore the consumption theories of business. 4. Exhibit the concepts of pricing policy 5. Analyze the cost concepts.		
Unit	**Content**		**No. of Hours**
I	**Introduction** Managerial Economics – Nature and scope – Relationship with other fields – Decision making and forward planning.		18
II	**Demand and Forecasting** Objectives of firm – Role of a managerial economist – Demand forecasting – Purpose – methods - GDP		18
III	**Consumption theories** Consumption theories – Law of diminishing Marginal Utility – Law of demand – Elasticity of Demand Price Income, Advertisement		18
IV	**Pricing** Pricing methods and problems – Cost plus target pricing – Marginal cost pricing - Going rate pricing – Customary prices – Specific pricing problems - Inflation – Types - Deflation		18
V	**Cost Analysis** Cost Analysis – Cost concepts – Classifications – Cost – Output relationship – Break Even Analysis.		18
Books for Study	**1.**S.Sankaran, *Managerial Economics* -Margham Publications, 2019.		
Books for Reference	1. Maria John Kennedy, *Managerial Economics* - Himalaya Publishing House, 2019. 2. S.N.Maheswari, *Business Economics* - Himalaya Publishing House, 2020		

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

CO 1	Retrieve knowledge on business economics	K1
CO 2	Outline the impact of demand forecasting	K2
CO 3	Interpret the consumption theories of business	K2
CO 4	Illustrate pricing concepts in business	K3
CO 5	Explain the cost analysis in business	K2

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	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	0.01 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
Observation	**COs of Business Economics – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

LEGAL ASPECTS OF BUSINESS

Template for Course Syllabus

Title (Core – 10)	**LEGAL ASPECTS OF BUSINESS**	Course Code	19UBAD04
Class	**II BUSINESS ADMINISTRATION**	Hours	**75**
Semester	**IV**	Credit	**04**
Course Educational Objectives (CEO)	1. Introduce the basic of Law of contracts 2. Discuss the law of partnership act 3. Understand the factories act 4. Inculcate the payment of wages act 5. Familiarise the industrial disputes act		
Unit	**Content**		**No. of Hours**
I	**Law of contracts** Law of contracts Essential elements of a valid contract – Kinds of contract - Capacity to contract – Minor – Persons of unsound mind – other persons – other disqualifications		15
II	**Law of partnership** Law of partnership –Characteristics– Formation and duration of partnership – Registration of firms – Rights, Duties and liabilities of partners – Types– Reconstitution of a firm – Dissolution of a firm – Modes of dissolution.		15
III	**The Factories Act** The Factories Act, 1948 - Definitions- Health, safety and welfare measures -The Workmen's Compensation Act, 1923- Disablement – Partial and Total disablement, employer and liability for compensation – Occupational diseases		15
IV	**Payment of Wages Act** Payment of Wages Act-payment of wages, permissible deductions from the wages, limits on deductions. Payment of Bonus Act- Employer eligibility and disqualification for bonus section 8 and 9, computation of gross profit - Minimum Bonus, Maximum bonus, time limit for payment of bonus.		15
V	**The Industrial Disputes Act** The Industrial Disputes Act 1947 – Definition – Industrial Disputes – Procedure for settlement of Industrial disputes – Strikes- Types, Lockouts, Layoff and Retrenchment -		15

	Conciliation machinery – Works committee – Court of enquiry – Tribunals – Arbitration .	
Books for Study	1. N.D.Kapoor,*Elements of Mercantile Law* –– Sultan Chand and Sons, 2019.	
Books for Reference	1. Gulshan SS, Kapoor G.K – Business Law –New age International, 2018. 2. Baluchandar .K.R., Business Law – Himalaya Publications, 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

CO 1	Retrieve knowledge on basic of contract law	**K1**
CO 2	Understand the law of partnership	**K2**
CO 3	Outline the concepts of law of factories act	**K2**
CO 4	Describe payment of wages act	**K2**
CO 5	Interpret the industrial disputes act	**K2**

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							18
CO2	3	3	3		3	3	3							18
CO3	3	3	3		3	3	3							18
CO4	3	3	3		3	3	3							18
CO5	3	3	3		3	3	3							18
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	0.01 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
Observation	**COs of Business Law – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
OPERATIONS RESEARCH

Template for Course Syllabus

Title(Allied – 4)	**Operations Research**	Course Code	
Class	**II BUSINESS ADMINISTRATION**	Hours	**75**
Semester	**IV**	Credit	**04**
Course Educational Objectives(CEO)	1. Learn the concepts and applications of Operations Research. 2.Identify and develop operational research models from the verbal description of the real system and to solve linear programming problems using appropriate techniques and interpret the results obtained and translate solutions for decision making. 3. Understand the applications of, basic methods in transportation and assignment problem 4. Solve network models like the shortest path, and PERT problems 5. Cognitive skills to provide solutions for game theory and to predict solutions for queuing problems.		

Unit	Content	No. of Hours
I	**Introduction to Operations Research** Introduction to Operations Research – Evolution of the Discipline – Applications of OR – Role of operations research in Business and Management – General methods for solving O.R models – Main phases of Operations Research - Limitations	15
II	**Linear Programming** Introduction to Linear Programming – Formulation of Linear Programming model - Graphical method – Simplex method – Problems with slack variables.	15
III	**Transportation and Assignment Problem** Transportation problem – Standard transportation table – Types: North West Corner Method, Least Cost Method, Vogel's Approximation Method Assignment problem- Difference between Transportation problem and Assignment problem – Balanced assignment problems	15
IV	**Network Techniques** Network Techniques – Shortest Path model – Critical Path Method – Program Evaluation and Review Technique – Differences between CPM and PERT	15
V	**Game Theory and Queuing Models** Game theory – Two person Zero Sum Game – The Maximin and Minimax Principle – Saddle Point	15

	Queuing theory – Queuing system – Birth and Death model	
Book for Study	V.Sundaresan, K.S.Ganapathy Subramanian, K.Ganesan., *Resource Management Techniques*. - A.R.Publications, 2018	
Books for Reference	1. Kapoor.V.K., *Operations Research* - Prentice Hall of India, 2020. 2. Panneerselvam R. *, Operations Research* - Prentice Hall of India, 2017. 3. Sharma.J.K., *Quantitative Techniques for Managers* - Macmillan India Ltd., 2018.	

Teaching and learning methods

- Class Lecture
- Group Discussion
- ICT (Information communication Technology)

Course Outcome (CO)

On successful completion of the course, the student able to

CO 1	Retrieve concepts and applications of Operations Research.	**K1**
CO 2	Solve linear programming problems using appropriate techniques and interpret the results obtained and translate solutions for decision making.	**K3**
CO 3	Compute basic methods in transportation and assignment problem	**K3**
CO 4	Solve network models like the shortest path, and PERT problems	**K3**
CO 5	Simplify game theory and to predict solutions for queuing problems.	**K4**

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			18
CO2	3		3			3	3			3	3			18
CO3	3		3			3	3			3	3			18
CO4	3		3			3	3			3	3			18
CO5	3		3			3	3			3	3			18
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	0.01 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
Observation	**COs of Operations Research – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
ESSENTIALS OF LEADERSHIP

Template for Course Syllabus

Title (NME 1)	**ESSENTIALS OF LEADERSHIP**	Course Code	
Class	**II BUSINESS ADMINISTRATION**	Hours	**45**
Semester	**III**	Credit	**02**
Course Educational Objectives(CEO)	1. Introduce the fundamentals of Leadership qualities essential for business 2. Explore the concepts of various leadership styles 3. Give an idea about the behavioral aspects of leadership models 4. Exhibit the concepts of appropriate leadership style to heterogeneous groups 5. Analyze the various perspectives in leadership		

Unit	Content	No. of Hours
I	**Introduction to Leadership** Individual as a leader- Leadership ethics and Traits - Functions; Leadership Roles: Leaders Vs Managers: Theories	9
II	**Leadership Styles** Effective Vs Successful Managers; Leadership Styles: Transformational Leadership – Transactional Leadership – Autocratic – Bureaucratic – Charismatic – Democratic – Laissez Faire – task Oriented Styles.	9
III	**Leadership Models** Leadership Models – Functional – Integrated – Situational – Trait based models	9
IV	**Leadership in organisation** Leadership ethics – Diversity and culture – Change management – strategic leadership – Leadership in learning organization and crisis leadership	9
V	**Perspectives in Leadership** Influencing : politics, Power, Negotiation, and Networking – Developing leadership skill – Leadership styles of Indian manager – Women and Leadership	9
Books for Study	1. Achua, Lussier – Effective Leadership – Cengage Publisher - 2019.	
Books for Reference	1. A.Chandramohan – Leadership and Management – Himalaya Publishers – 2020 2. PerterG.Northhouse - Introduction to Leadership, Concepts and Practices – SAGE Publication - 2019 3. 3. AfsanehNahavandi – The Art and Science of Leadership – Prentice Hall - 2018	

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

CO 1	Retrieve knowledge on fundamentals of Leadership qualities essential for business	K1
CO 2	Interpret the concepts of various leadership styles	K2
CO 3	Apply the behavioral aspects of leadership	K3
CO 4	Analyse appropriate leadership style to heterogeneous groups	K4
CO 5	Examine various perspectives in leadership	K4

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	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
CO4	3	3	3		3	3	3	3	3	3	3			30
CO5	3	3	3		3	3	3	3	3	3	3			30
Grand Total of COs with PSOs and POs														150
Mean Value of COs with PSOs and POs = 150/50														3

*: 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			3
Observation	**COs of Organisational Behaviour – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
INTRODUCTION TO RURAL MARKETING

Template for Course Syllabus

Title (NME – 2)	**INTRODUCTION TO RURAL MARKETING**	Course Code	
Class	**II BUSINESS ADMINISTRATION**	Hours	**45**
Semester	**IV**	Credit	**02**
Course Educational Objectives(CEO)	1. Introduction of rural marketing 2. To familiarize with the consumer behaviour related to Rural Market. 3. Illustrate the Rural product and pricing strategy. 4. Inculcate the rural distribution. 5. Explore the recent trends in rural marketing		

Unit	Content	No. of Hours
I	**Rural Marketing** Introduction – Meaning – Nature & Scope of Rural Marketing, Concepts – Classification of Rural Market, Rural VS Urban Market, Rural Marketing Environment.	09
II	**Rural Consumer Behavior** Rural Consumer Behavior, Consumer Buying Behavior in Rural Market, Factors Affecting Consumer Behavior, Problem in Rural Marketing.	09
III	**Rural Product and Pricing Strategy** Rural Product, Rural Product Classification – Rural Product Life Cycle, Product Life Cycle Strategies in Rural Market – New Product Development in Rural Markets, Branding for Rural Markets – Pricing for Rural Market Factors.	09
IV	**Rural Distribution** Wholesale & Retailing in the Rural Market – Rural Mobile Traders, Rural Distribution Models – FMCG Companies, Durable Companies, Service Organization, Emerging Distribution Models.	09
V	**Trends in Rural Marketing** Digitizing Rural India, Online Marketing Reach in the Rural Marketing, Recent Trends in Packing, Labeling, Grading, Transporting, Order Processing, Payment Methods, Storage & Warehousing.	09

Book for Study	1. Acharya S.S & Agarwal N.L, Agricultural Marketing in India, Oxford & IBH Publishing Co.Pvt LTD,2019
Books for Reference	1. Dinesh Kumar & Punam Gupta, Rural Marketing , SSAGE Publication India Pvt.Ltd,2019 2. Badi R.V, Badi N.V, Rural Marketing, Himalaya Publishing House, 2018

Teaching and learning methods

- Class Lecture
- Video Lecture
- Group Discussion
- ICT (Information communication Technology)

Course Outcome (CO)

On successful completion of the course, the student able to

CO 1	Retrieve functions of an office.	K 1
CO 2	State and apply the best location and layout for an office	K3
CO 3	Illustrate mailing and filing system	K3
CO 4	Summarise the basic methods of Indexing	K2
CO 5	Describe the appropriate office appliances	K2

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	3	3		3				27
CO2	3	3	3	3	3	3	3	3		3				27
CO3	3	3	3	3	3	3	3	3		3				27
CO4	3	3	3	3	3	3	3	3		3				27
CO5	3	3	3	3	3	3	3	3		3				27
Grand Total of COs with PSOs and POs														135
Mean Value of COs with PSOs and POs = 135/45														3

*: 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			3
Observation	**COs of Introduction to Office Management – Strongly related with PSOs and Pos**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
E BUSINESS

Template for Course Syllabus

Title (NME II)	**E BUSINESS**	Course Code	
Class	**II BUSINESS ADMINISTRATION**	Hours	**45**
Semester	**IV**	Credit	**02**
Course Educational Objectives(CEO)	1. Introduce the fundamentals of e-Business environment 2. Give an idea about E – market places 3. Explore the knowledge on B2C , e-tailing concepts 4. Exhibit the concepts of B2B e – business and issues of B2B exchange 5. To understand E-business strategy and implementation		

Unit	Content	No. of Hours
I	**Introduction to E-Business** Techniques- Infrastructure – Latest technology of E – Business	9
II	**E – Marketplaces** Types of e-marketplaces – e-market success factors – unique features of e-marketplaces – economic impact of e-marketplaces	9
III	**B2C e-Business** Electronic retailing (e-tailing,) – Characteristics – Primary e-tailing models – the decision making process of consumers purchasing online	9
IV	**B2B e-Business** Major B2B models – Characteristics - sell side / buy-side market places – standard requirement for e–Business-issues of B2B exchange	9
V	**E-Business strategy and implementation** The strategy planning process – strategy implementation and assessment –Requirements and process of initiating an online business – social impacts of e-Business	9
Books for Study	1. Kenneth C.Laudon, JaneP.Laudon, Management Information systems – Pearson – Thirteen edition - 2018	
Books for Reference	1. Andreas Meier, Henrik Stormer – e Business & e Commerce – Springer - 2019 2. Dr.C.Rayodu – E Commerce E Business – Himalaya Publishing House - 2022 3. Suman M , Divakara Reddy et.al., - E-Business Accounting – Vision Book House - 2016	

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

CO 1	Retrieve knowledge on fundamentals of e-Business environment	K1
CO 2	Interpret the concepts of about E – market places	K2
CO 3	Analyse the knowledge on B2C , e-tailing concepts	K4
CO 4	Analyse B2B e – business and issues of B2B exchange	K4
CO 5	Examine E-business strategy and implementation	K4

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	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
CO4	3	3	3		3	3	3	3	3	3	3			30
CO5	3	3	3		3	3	3	3	3	3	3			30
Grand Total of COs with PSOs and POs														150
Mean Value of COs with PSOs and POs = 150/50														3

*: 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			3
Observation	**COs of Organisational Behaviour – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
EXECUTIVE COMMUNICATION - II

Template for Course Syllabus

Title (SBE– 2)	**EXECUTIVE COMMUNICATION – II**	Course Code	19UBAS24
Class	**II BUSINESS ADMINISTRATION**	Hours	**45**
Semester	**IV**	Credit	**02**
Course Educational Objectives(CEO)	1. Impart knowledge on business presentation skills 2. Discuss about negotiation skills 3. Guide them in preparing resume 4. Inculcate the ways of planning meetings 5. Develop knowledge on decision making skill.		

Unit	Content	No. of Hours
I	**PRESENTATION SKILLS** Presentation Skills – Elements of presentation – use of aid – designing a presentation – Advanced visual support for business presentation – types of visual aid.	9
II	**NEGOTIATION SKILLS** Negotiation – Nature and need for negotiation – Factors affecting negotiation – Stages of negotiation process – Negotiation strategies.	9
III	**LISTENING SKILLS** Importance of Listening Skills, The Listening process Cultivating good Listening Skills, Barriers to Listening and Techniques	9
IV	**GROUP COMMUNICATION** Need and Importance of Meetings, Conduct of Meeting Role of the Chairperson, Role of the Participants Drafting of Notice, Agenda and Resolutions	9
V	**VERBAL & NON VERBAL COMMUNICATION** Target group profile – Developing Decision Making Skill – Feedback, Public speaking: Essentials, Developing confidence and overcoming fear Barriers, Non- verbal communication-Types.	9
Books for Study	**Text Book:** 1. Dr,NageshwarRao, Dr.RajendraP.Das – *Communication Skills* – Himalaya Publishing House - 2019	
Books for Reference	**Reference Books:** 1. P D Chaturvedi, Mikesh Chadurvedi - *Business Communication: concepts, Cases, and Applications* - Pearson education, 2020. 2. Mary Ellen Guffey – *Business Communication Process and Product* - Thompson Learning, 2019.	

	3. Penrose, Rasberry, Myers – *Advanced Business Communication* - Thompson Learning– 2018.

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

CO 1	Summarise basic elements of presentation skills	K2
CO 2	Illustrate negotiation skills	K3
CO 3	Apply knowledge on drafting a Resume	K3
CO 4	Organise and lead meetings	K3
CO 5	Utilise verbal and non-verbal communication skills in life	K3

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		2				20
CO2	3	3	3			3	3	3		2				20
CO3	3	3	3			3	3	3		2				20
CO4	3	3	3			3	3	3		2				20
CO5	3	3	3			3	3	3		2				20
Grand Total of COs with PSOs and POs														100
Mean Value of COs with PSOs and POs = 100/35														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	**COs of Executive Communication II – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

DIGITAL MARKETING

Template for Course Syllabus

Title (SBE– 2)	**DIGITAL MARKETING**	Course Code	
Class	**II BUSINESS ADMINISTRATION**	Hours	**45**
Semester	**IV**	Credit	**02**
Cognitive Level	**K-1** Knowledge **K-2** Understanding **K-3** Application **K-4** Analysis **K-5** Evaluation		
Course Educational Objectives (CEO)	1. Introduce the basics of Digital Marketing 2. Discuss the various forms of online advertising. 3. Explore the skills of e- marketing process. 4. Exhibit the knowledge of Social Media Marketing 5. Analyze the concept of Search Engine Optimization.		

Unit	Content	No. of Hours
I	**Digital Marketing:** Introduction to Digital Marketing- Traditional Vs. Digital Marketing -Technology behind Digital Marketing- Characteristics of Digital Marketing, Digital Marketing Strategy, Understanding Digital Consumer.	
II	**Online Advertising:** Introduction- Objective- Advertise- Online Ad-Format- Search Engine-Ad-Network- Advertising.	
III	**Email Marketing:** Introduction- Types of Email- Email Marketing Campaign Process- Email marketing Tools- Advantages and Disadvantages- Email Advertising- Email tracking	
IV	**Social Media Marketing (SMM)** Social Media Marketing – Seven Myths of SMM – Social Media Marketing plan - Social Media marketing Tools – Social Media Monitoring – Social Media: Facebook, Twitter.	
V	**Search Engine Optimization (SEO):** Understanding SEO – Search Engine Optimization Process – On-Page Optimization – Off-Page Optimization – Search Engine Result Process (SERP)– SEO Tools.	

Books for Study	1. Seema Gupta, Digital Marketing - McGraw hill, 2022
Books for Reference	1. Michel Branding, Social Media Marketing - -Notion Press,2021
	2. Cecilia Figeuroa, Introduction to Digital Marketing 101 – BPB Publication, 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

CO 1	Gain knowledge on Digital Marketing	K1
CO 2	Know the impact of Online Advertising	K2
CO 3	Familiarizing the email-Marketing tools.	K2
CO 4	Reap the knowledge on Social Media Applications.	K4
CO 5	Familiar with the Search Engine Optimization.	K2

Mapping Course Outcome

Objectives Outcome	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 5	Level*	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Level*
CO1	✓							✓								
CO2		✓							✓							
CO3		✓					L			✓						M
CO4					✓								✓			
CO5		✓									✓					

*: S-Strong; M-Medium; L-Low

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
BUSINESS CASE ANALYSIS

Template for Course Syllabus

Title (SBE – 2)	**Business case Analysis**	Course Code	
Class	**II BUSINESS ADMINISTRATION**	Hours	**45**
Semester	**IV**	Credit	**02**
Course Educational Objectives(CEO)	1. Impart the introduction to case methods. 2. Reveal the importance of case writing. 3. Illustrate how to analyze case. 4. Inculcate the ways to identify solution. 5. Explore live cases.		

Unit	Content	No. of Hours
I	**Introduction to case methods** Identification of problems/ decision areas in the case – Major and minor problems. Identification of protagonists, Analysis with reference to the long term and short term objectives of the organization.	09
II	**Case writing** Identification of theoretical concepts applicable in the given situation. Evaluation of alternative solutions, Selection of optimum solution with justification , Implementation of the solution	09
III	**Case Analysis** Approaching the organization and identifying the right person to collect the data, Collecting the data/information, Analyze the data to identify the problem	09
IV	**Find solutions** Define the focus (functional area) of the case, Writing the case , Case Analysis- with suggested solution.	09
V	Business case studies in all subjects	09
Book for Reference	1. Dr.Srinivasan R.Iyengar - Case study in Business Perspective – Volume I – Himalaya Publishing House – 2021 2. Dr.Srinivasan R.Iyengar - Case study in Business Perspective – Volume II – Himalaya Publishing House - 2020	

Teaching and learning methods

- Class Lecture
- Video Lecture
- Group Discussion
- ICT (Information communication Technology)

Course Outcome (CO)
On successful completion of the course, the student able to

CO 1	Retrieve functions of case study method	K 1
CO 2	State and apply the ways to write case	K3
CO 3	Illustrate the ways to define case analysis	K3
CO 4	Apply solutions to cases	K2
CO 5	Live practices in solving cases	K2

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	3	3		3				27
CO2	3	3	3	3	3	3	3	3		3				27
CO3	3	3	3	3	3	3	3	3		3				27
CO4	3	3	3	3	3	3	3	3		3				27
CO5	3	3	3	3	3	3	3	3		3				27
Grand Total of COs with PSOs and Pos														135
Mean Value of COs with PSOs and POs = 135/45														3

*: 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			3
Observation	**COs of Introduction to Office Management – Strongly related with PSOs and Pos**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
Body Language

Template for Course Syllabus

Title(SLC-1)	**BODY LANGUAGE**	Course Code	19UBASL3
Class	**II BUSINESS ADMINISTRATION**	Hours	-
Semester	**III**	Credit	**03**
Course Educational Objectives(CEO)	1. Introduce the fundamentals of Body Language 2. Explore the concepts of Facial expression 3. Give an idea about the movements and gestures 4. Exhibit the concepts of Posture during Interview. 5. Understand salesmanship and his body language		
Unit	**Content**	**No. of Hours**	
I	**Introduction to Body Language** Body language in Interpersonal communication – Use of body language – Communicating methods – Types of body language – The impression – Stages – Body language during job interviews – Do's and Don'ts		
II	**Eye Contact and Facial Expressions** Eye contact – Gaze behavior – Methods to improve best eye conduct–Facial expressions – Types – Face facts – Importance of smile.		
III	**Movements and Gestures** Head movements– Talking heads – listening heads – Head gestures – Basic head positions – Gesture and body movements – Common gestures – Thumb displays – Face gestures – Evaluation.		
IV	**Posture and Territories** Posture and Stance – Types – Posture – Proximity and Orientati Territories – Seating arrangements		
V	**Behaviour and Appearance** The touch behavior – Bodily conduct and touching – Dominant and submissive handshakes – appearance and physique – Body shape and size – body language for sales person – Top ten body language.		
Book for Study	1. Dr.Shalini Varma, *Body Language Your Success Mantra.* – S.Chand and Company ltd., 2021.		
References	1. Harvey Segler – Body Language – Create space Independent Publishing Platform – 2016		

	2. Allan, Barbara – The Definitive book of Body Language – Pease International - 2018

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

CO 1	Explain the basis of fundamentals of Body Language	K2
CO 2	Outline the concepts of Facial expression	K2
CO 3	show the movements and gestures of body language	K2
CO 4	Translate the importance of posture in an interview	K2
CO 5	Extend the importance of body language in salesmanship	K2

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		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	0.01 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
Observation	**COs of Body language – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION
GROUP DISCUSSION

Template for Course Syllabus

Title (SLC)	Group Discussion	Course Code	19UBASL4
Class	**II BUSINESS ADMINISTRATION**	Hours	-
Semester	**IV**	Credit	**03**
Course Educational Objectives(CEO)	1. Introduce the fundamentals of group discussion. 2. Explore myths and ideas about group discussion 3. Impart knowledge on presentation skills 4. Inculcate interview techniques. 5. Discuss interview process		

Unit	Content	No. of Hours
I	**Introduction to Group Discussion** Group Discussion – Concept – Methodology – Components – Leadership – Role players – Positive and negative traits-suggestions – Success in a Group discussion.	
II	**Myths and Ideas** Myths of group discussion – Generating Ideas and technique group discussion – Evaluation.	
III	**Presentation Skills** Presentation skill – Importance – preparation – structuring the presentation and communication aids – Delivery – Dealing with nerves – Making a great first impression – Phrasing and delivering the speed.	
IV	**Interview Techniques** Interview – Importance – Techniques – Advantages and Disadvantages – Appearing for interview- Types of questions expected.	
V	**Interview Process** Interview process – Writing a resume – Qualities of a candidate - Telephonic interview – Criteria for evaluating a candidate.	
Book for Study	1. Hari Mohan Prasad and Rajnish Mohan, *How to prepare for Group Discussion and interview* - Tata McGrew Hill, 2021.	
References	1. Nitin Sharma – Group Discussion –Unicorn Publisher – 2018 2. Gloria J.Galanes et.al., -Efffective Group Discussion – McGFraw Hill - 2017	

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

CO 1	Retrieve knowledge on group discussion	K1
CO 2	Describe the techniques to attend group discussion	K2
CO 3	Recall presentation skills	K1
CO 4	Describe interview techniques	K2
CO 5	Apply interview techniques	K3

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		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	0.01 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
Observation	**COs of Group Discussion – Strongly related with PSOs and POs**		

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

Class   : BBA   **Part   : Value Added Course**

Semester   *:* I   **Hours   : 30**

DATA ANALYSIS USING STATISTICAL PACKAGE FOR SOCIAL SCIENCES (SPSS)

Course Objectives

1. To give the basic knowledge about SPSS

2. To make the students familiarize with computing variables.

3. To prepare the students to explore data

4. To get familiarized with correlation and Chi Square statistical tools

5. To get familiarized with One sample and One Way ANOVA statistical tools

Unit-I: Introduction to SPSS   **(6 hours)**

Data view window – Data creation – Importing data – Variable types in SPSS and Defining variables – Creating a Codebook in SPSS.

Unit - II: Computing Variables   **(6 hours)**

Computing Variables - Recoding (Transforming) Variables: Recoding Categorical String Variables using Automatic Recode - Sorting Data - Grouping or Splitting Data..

Unit - III: Exploring Data   **(6 hours)**

Exploring Data Descriptive Statistics for Continuous Variables - The Explore procedure - Frequencies Procedure – Descriptive Analysis

Unit- IV: Analysing Data – I   **(6 hours)**

Inferential Statistics for Association: Pearson Correlation, Chi-square Test of Independence

Unit –V: Analysing Data- II   (**6 hours**)

 Inferential Statistics for Comparing Means: One Sample t Test, One-Way ANOVA

Text Book

1. IBM 2016, IBM Knowledge Center: SPSS Statistics, IBM, viewed 18 May 2016, https://www.ibm.com/support/knowledgecenter/SSLVMB/ welcome/

References:

1. HOW TO USE SPSS ® A Step-By-Step Guide to Analysis and Interpretation, Brian C. Cronk, Tenth edition published in 2018 by Routledge.

2. SPSS for Intermediate Statistics: Use and Interpretation, Nancy L. Leech et. al., Second edition published in 2005 by Lawrence Erlbaum Associates, Inc

3. Using IBM SPSS statistics for research methods and social science statistics, William E. Wagner, Fifth edition published in 2015 by SAGE Publications, Inc.

Criteria for Getting the Certificate

1. Students shall have at least 75% attendance to complete the course.
2. The course is framed to be of 30 hour duration.
3. The total score of the course will be 50 out of which 10 marks are assigned for internals and 40 marks are for the proctored exam.
4. The course coordinator will be in charge of the examinations. Two assignments of 5 marks each will be given during the course. Course end examination will be conducted on SPSS software out of 40 marks.
5. The students shall attend and pass the exam, which will be completed at the end of the course, with at least 40% marks.
6. Students shall secure 40% marks in proctored assignments as well as in the exam.

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625514
DEPARTMENT OF BUSINESS ADMINISTRATION

Class	**: BBA**	**Part**	**: Value Added Course**
Semester	*: II*	**Hours**	**: 30**

CORPORATE SKILLS FOR EXECUTIVES

Course Objectives

1. To give the basic knowledge on corporate skills
2. To make the students familiarize with communication skills
3. To prepare the students with business etiquettes
4. To prepare students for corporate look
5. To prepare students to face interview

Unit-I: Introduction to Corporate Skills (6 hours)

The Mind - Positive thinking & Attitude, Motivation, Character Building, Self Esteem, Goal Setting

Special Corporate Skills - Interpersonal Relationship, Leadership Qualities, Time Management, Stress Management

Unit - II: Effective Communication (6 hours)

English Conversation, Pronunciation, Voice Modulation, Stressing and stretching, Accent Improvisation, Facial Expressions, Body language, Writing skills.

Unit - III: Business Etiquettes (6 hours)

-Business Etiquettes Office Etiquettes, Phone Etiquettes, Dining Etiquettes, Party Etiquettes

Unit- IV: Corporate Look (6 hours)

Office Wear, Meetings/Interviews, Business Presentations

Unit –V: Executive Skills (6 hours)

Writing a profile (Personal/ Company), Group Discussion, Facing an Interview, Business Presentation Skills

Text Book

1. M.S.Rao - Soft Skills - Enhancing Employability : Connecting Campus with Corporate : Marshall Goldsmith - 2013

References:

1. Dr.P.Sundarapandian et.al., - Employability Skills – VHNSN college - 2020
2. Gopalaswamy Ramesh, Mahadevan Ramesh - The ACE of Soft Skills: Attitude, Communication and Etiquette for Success – Pearson - 2013

Criteria for Getting the Certificate

1. Students shall have at least 75% attendance to complete the course.
2. The course is framed to be of 30 hour duration.
3. The total score of the course will be 50 out of which 10 marks are assigned for internals and 40 marks are for the proctored exam.
4. The course coordinator will be in charge of the examinations. Two assignments of 5 marks each will be given during the course. Course end examination will be conducted on SPSS software out of 40 marks.
5. The students shall attend and pass the exam, which will be completed at the end of the course, with at least 40% marks.
6. Students shall secure 40% marks in proctored assignments as w

DEPARTMENT OF
INFORMATION TECHNOLOGY
& MANAGEMENT

1. Learn current techniques and modern tools necessary to develop the software applications and business.

2. Identify, analyze, formulate and solve technical problems by applying principles of Information Technology and Management to the problem.

3. Take up multidisciplinary projects and to carryout it asper industry standards.

4. Comprehend and apply the technical solution sin 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 IT&M
OBE SYLLABUS (From 2022-2023 onwards)

Part	Subject Code	Subject Title	Hours	Credits
		III SEMESTER		
III	22UITC53	**Core–5** Operating Systems	5	4
	22UITC63	**Core–6** DBMS	4	3
	22UITC73	**Core–7** Web Technology	4	3
	22UITP33	Programming in Web Technology Lab-3	5	3
	22UITA33	**Allied–3** Business Accounting	5	4
IV	22UITN13	Basic Tamil/Advanced Tamil/**NME-1** Image Editing Tools	3	2
	22UITS13	**Skillbased Elective-1** Business Law	3	2
	22UFCE33	**FC**-Environmental Studies	1	1
V	22UNCC/NSS/ PHY.EDU./YRC /ROT/ACF/ NCB24	**Extension Activities** NSS/NCC/Phy.Edn./YRC/ROTARACT/ AICUF/Nature Club	-	-
	22UARE14	ARISE	-	-
		Total	**30**	**22**
		IV SEMESTER		
III	22UITC84	**Core–8** Organizational Behaviour	4	4
	22UITC94	**Core–9** Computer Network	5	4
	22UITD04	**Core–10** Dot Net Programming	4	2
	22UITP44	Dot Net Programming Lab-4	5	3
	22UITA44	**Allied–4** Web Marketing	5	4
IV	22UITN24	Basic Tamil/ Advanced Tamil/**NME-2** Ethical Hacker	3	2
	22UITS24	**Skillbased Elective-2** Business Statistics	3	2
	22UFCH44	**FC**-Religious 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
		Total	**30**	**24**

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

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR

DEPARTMENT OF IT&M

Class	: II IT&M		Part	: Core- 5
Semester	: III		Hours	: 75
SubjectCode	: 22UITC53		Credits	: 4

OPERATING SYSTEMS

1. **Title of the Paper**: **OPERATING SYSTEMS**

2. **Course Educational Objectives (CEO)**

   i. Understand the structure and functions of Operating System.
   ii. Impart the knowledge of Processes and CPU Scheduling algorithms.
   iii. Know how the operating systems handle the Deadlocks.
   iv. Understand how operating systems manage the Memory and Page Replacement.
   v. Case Study of Linux Operating System.

3. **Five Units of the Syllabus**

UNIT	Content	No.of Hours
I	**Introduction** Operating System – Mainframe Systems – Desktop Systems – Multiprocessor Systems–Distributed Systems–Clustered Systems – Real Time Systems – Handheld Systems. Operating System Structures: - System Components – Operating System Services–System Structure:Simple Structure, Layered Approach.	15
II	**Process Management** Processes:-Process Concept–Process Scheduling–Operationon Processes–Cooperating Processes. CPU Scheduling:-Basic Concepts–Scheduling Criteria–Scheduling Algorithms.	15
III	**Process Synchronization**: -Background –The Critical Section Problem–Semaphores. Deadlocks: System Model–Deadlock Characterization–Methods for handling Deadlocks–Deadlock Prevention–Deadlock Avoidance–Deadlock Detection–Recovery from Deadlock.	15
IV	**Memory Management** Swapping–Paging–Segmentation.Virtual Memory:Demand Paging–Page Replacement Techniques–Thrashing.	15
V	**CaseStudy:Linux Operating System** History –Design Principles–Kernel-Process Management–File System–Network Structure–Security.	15

4. **Book for Study:**

   Silberschatz, Galvin, Gagne, "Operating System Concepts", 8th Edition John Wiley & Sons Inc, 8th Edition, New Delhi, 2009.

5. Books for References:
  I. Andrew S.Tanenbaum, Albert S WoodHull, "Operating Systems–Design and Implementation", Prentice Hall, New Delhi,1997.
  II. Milan Milenkovic,"Operating Systems Concepts and Design", Tata Mcgraw Hill, New Delhi, 1992.

6. Teaching Learning Methods:
  (PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

7. Course Outcome (CO)
On completion of the course, students should be able to
  CO1: Describe with basic concepts of Operating Systems.
  CO2: Discover the knowledge about the Process Management & CPU Scheduling concepts.
  CO3: Identify Deadlock problems and its Prevention mechanism.
  CO4: Describe the Memory Management concepts.
  CO5: Discover Knowledge about the Linux Operating System.

8. Course Outcome Level (preferable one for each objective)
  CO_1 - K_3
  CO_2 - K_3
  CO_3 - K_3
  CO_4 - K_4
  CO_5 - K_3

9. 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
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
Grand Total of COs with PSOs and POs														103
Mean Value of COs with PSO and POs														2.24

*: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
Meanvalue of COs With PSOs and POs			**2.24**
Observation	**COs of OPERATING SYSTEMS Strongly related with PSOs and POs**		

Class   : II IT& M   Part   : Core - 6

Semester   : III   Hours   : 60

Subject Code : 22UITC63   Credits : 03

DBMS

1. **Title of the Paper** :**DBMS**

2. **Course Educational Objectives (CEO)**

1. Comprehend the basic concepts about DBMS.
2. Impart the knowledge of Entity Relationship Model.
3. Distinguish the important concepts Relational Model.
4. Understand the concept of SQL.
5. Able to understand the Other Relational Languages in DBMS.

3. **Five Units of the Syllabus**

UNIT	Content	No. of Hours
I	**Introduction** Purpose of Database Systems- view of Data – data models – Database Languages – Transaction Management - Storage Management – Database Administrator-Database users.	12
II	**Entity Relationship Model** Basic concepts – Design issues – Mapping Constraints – keys-Entity Relationship Diagram-Weak Entity sets- Extended E R Features-Design of an E R Database schema- Reduction of and ER Schema to tables.	12
III	**Relational Model** Structure of Relational Database-The Relational Algebra-the Tuple Relational Calculus-The Domain Relational calculus- Extended Relational Algebra Operations- Modification of Database-views.	12
IV	**SQL** Background-Basic Structure- Set Operations-Aggregate Functions-Null values-nested subqueries-derived Relations-views-Modifications of the Database-joined Relations-Data Definition Language Embedded SQL.	12
V	**Other Relational Languages** Queries on One Relation – Queries on Several Relation – Modification of the Database – Quel – Tuple Variables – Aggregate Functions – Insertion & Updates – Set Operations - Datalog – Semantics of Nonrecursive Datalog	12

4. **Book for Study:**

   I. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, "Database System Concepts", The McGraw-Hill Companies, Inc Publications, 6th Edition, 2010.

5. **Book for References:**

   I. Ramez Elmasri and Shamkant B. Navathe, "Fundamentals of Database Systems" Pearson Education Inc., Publications, 5th Edition, 2008.

6. **Teaching Learning Methods:**

   (PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

7. **Course Outcome (CO)**

   1: Understand the Data Models and Database Language concepts.
   2: Understand the Concepts of Entity Relationship Models.
   3: Understand the Tuple and Domain Relational Calculus.
   4: Analyze SQL Concepts to Modify the Database.
   5: Understand the Other Relational Languages in DBMS.

8. **Course Outcome Level** (preferable one for each objective)

   CO_1 - K_1 (Knowledge)
   CO_2 - K_2 (Understanding)
   CO_3 - K_3 (Application)
   CO_4 - K_4 (Analysis)
   CO_5 - K_5 (Synthesis & Evaluation)

9. **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
CO1	3	3	2	1		3	3	3	1					19
CO2	2	2	3	2	1	3	1	2	3					19
CO3	1	3	2	3		2	1	2	3	3				20
CO4	3	3	3	3	1	2	2	2	1	1				21
CO5	3	2	3	2	2	2	2	2	2	1				21
Grand Total of COs with PSOs and POs														100
Mean Value of COs with PSO and POs														2.17

   *: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
Meanvalue of COs With PSOs and POs			**2.17**
Observation	**COs of DBMS Strongly related with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF IT & M

Class	: B.Sc IT&M	Part	: III Core - 7
Semester	: III	Hours	: 60
Subject Code	: 22UITC73	Credits	: 3

WEB TECHNOLOGY

1.Title of the Paper: WEB TECHNOLOGY

2. Course Educational Objectives (CEO)
   o   Understand the internet basics and its related technologies
   o   Understand the Tags in Hyper Text Markup language to design the static webpage
   o   Understand the importance of client side scripting language in web development
   o   Understand the fundamentals of server side scripting language to design a dynamic webpage
   o   Understand the techniques of data manipulation with JDBC Concepts

3. Five Units of the Syllabus

UNIT	Content	No. of Hours
I	Internet Principles: Introduction to Internet - Client Server Model- Protocol - Internet IP Address- Domain Name - Internet Services - Electronic Mail - World Wide Web - Internet Security - ECommerce - EDI.	**12**
II	Introduction to HTML: HTML Tags - HTML Documents - Headings - Hyperlinks using Anchor Tag-Formatting Characters - Font - Images and Pictures - Listing - Tables in HTML Tags – Frameset: Frame Definition- Nested framesets - HTML Forms – Form Elements	**12**
III	JavaScript : Data Types - Variables - Operators - Conditional statements using Javascript– Document Objects - Image Objects using Javascript - Forms and Elements - Event Handling - Browser Object -Submit Event and Data Validation -parseInt() Function – parse Float() Function - Recursive Function.	**12**
IV	Server Side Script with JSP: Client Responsibilities -Server Responsibilities - Introduction to JSP – JSP Architecture - JSP Servers - JSP Tags - Request Object - Response Object - JSP Page.	**12**
V	JSP with JDBC : Creating ODBC Data Source Name - Introduction to JDBC -Telephone Directory with JDBC - Servlet Environment and Role - Protocol Support - HTML Support - Servelt Life Cycle - HTML to Servlet Communication	**12**

4.Book for Study:
  i.   C.Xavier, Web Technology and Design, First Edition, New Age International, 2011

5.Book for Reference
  i.   H.M.Deitel, P.J.Deitel, Internet and World Wide Web - How to Program", Third Edition, Pearson Publication, 2006.

6. Teaching Learning Methods:
   (PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

7.Course Outcome (CO)
On Successful completion of the course the students able to
  1. Understand the working principles of Internet and its related technologies
  2. Apply the HTML tags to develop the static web page
  3. Apply the event handling methods in client-side scripting language
  4. Understand the features of server-side scripting languages in web development
  5. Create dynamic web sites using the knowledge of data manipulating skills.

8. Course Outcome Level (preferable one for each objective)

  CO_1 - K_1 (Knowledge)
  CO_2 - K_2 (Understanding)
  CO_3 - K_3 (Application)
  CO_4 - K_4 (Analysis)
  CO_5 - K_5 (Synthesis & Evaluation)

9. 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
CO1	3	2	1		3	3	3	2	1					18
CO2	2	2	3	3	1	2	1	2	2					18
CO3	3	3	2	2		2	1	2	3	3				18
CO4	2	3	2	2	2	2	3	1	2	1				19
CO5	3	3	3	2		3	3	2	1	1				19
		Grand Total of COs with PSOs and POs												98
		Mean Value of COs with PSO and POs												2.18

   *: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			2.18
Observation	Cos of WEB TECHNOLOGY Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.
DEPARTMENT OF IT&M

Class	: B.Sc IT&M	Part	: III Lab-3
Semester	: III	Hours	:75
Subject Code	: 22UITP33	Credits	: 3

PROGRAMMING IN WEB TECHNOLOGY LAB

1. **Title of the Paper: PROGRAMMING IN WEB TECHNOLOGY LAB**

2. **Course Educational Objectives (CEO)**
   1. Understand the internet basics and its related technologies
   2. Understand the Tags in Hyper Text Markup language to design the static webpage
   3. Understand the importance of client side scripting language in web development
   4. Understand the fundamentals of server side scripting language to design a dynamic webpage
   5. Understand the techniques of data manipulation with JDBC Concepts

3. **Five Units of the Syllabus**

UNIT	Content	No. of Hours
I	HTML Tags - Headings - Hyperlinks using Anchor Tag- Formatting Characters - Font - Images and Pictures - Listing - Tables in HTML Tags – Frameset: Frame - Nested framesets - HTML Forms – Form Elements	12
II	JavaScript - Conditional statements using Javascript– Document Objects - Image Objects using Javascript-Function using Javascript	12
III	Forms and Elements - Event Handling - Browser Object - Submit Event and Data Validation -parseInt() Function – parse Float() Function - Recursive Function.	12
IV	Server Side Script with JSP: Client Responsibilities -Server Responsibilities - - JSP Tags - Request Object - Response Object - JSP Page.	12
V	JSP with JDBC : Creating ODBC Data Source Name - Introduction to JDBC -Telephone Directory with JDBC - Servlet Environment and Role - Protocol Support - HTML Support - Servelt Life Cycle - HTML to Servlet Communication	12

4.Book for Study:
   1. C.Xavier, Web Technology and Design, First Edition, New Age International, 2011.

5.Book for Reference
   1. H.M.Deitel, P.J.Deitel, Internet and World Wide Web - How to Program", Third Edition, Pearson Publication, 2006.

6.TeachingLearningMethods:
   (PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

7. Course Outcome (CO)

On Successful completion of the course the students able to

1. Understand the working principles of Internet and its related technologies
2. Apply the HTML tags to develop the static web page
3. Apply the event handling methods in client side scripting language
4. Understand the features of server side scripting languages in web development
5. Create dynamic web sites using the knowledge of data manipulating skills.

8. Course Outcome Level (preferable one for each objective)

CO_1	-	K_1 (Knowledge)
CO_2	-	K_2 (Understanding)
CO_3	-	K_3 (Application)
CO_4	-	K_4 (Analysis)
CO_5	-	K_5 (Synthesis & Evaluation)

9. 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
CO1	3	2	2		3	3	3	2	1					19
CO2	2	2	3	3	1	2	1	2	2					18
CO3	3	2	2	2		2	1	2	3	3				20
CO4	2	3	2	2	1	2	3	1	2	1				19
CO5	3	3	3	2		3	3	2	1	1				21
Grand Total of COs with PSOs and POs														97
Mean Value of COs with PSO and POs														2.16

*: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
Meanvalue of COs With PSOs and POs			2.16
Observation	**COs of PROGRAMMING INWEB TECHNOLOGY LAB Strongly related with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.

DEPARTMENT OF IT&M

Class	: III T &M	Part	: Allied-3
Semester	: III	Hours	: 75
Subject Code	: 22UITA33	Credits	: 4

BUSINESS ACCOUNTING

1. **Title of the Paper** : **BUSINESS ACCOUNTING**

2. **Course Educational Objectives (CEO)**

   1: Knowing the basic concepts and Introduction of Accounts.
   2: Understanding the importance, rules and Preparation of journal.
   3: Learning the Ledger and concepts of single entry system.
   4: Comprehending the concept of main subsidiary books.
   5: To prepare the final accounts.

3. **Five Units of the Syllabus**

Unit	Content	No. of Hours
I	**Introduction of Accounts** Financial Accounting: Definition, objectives, functions, limitations–concepts and conventions –Double entry system of book keeping: Rules.	15
II	**Journal** Journal: Definition-Objectives–importance–advantages and limitations –rules of Journalizing-Preparation of journal.	15
III	**Ledger and Single Entry System** Ledger: Definition- Rules – Advantages- Preparation of Ledger- Single Entry System: Concepts - Features - Merits & Demerits- difference between single entry system and double entry system.	15
IV	**Subsidiary book** Main subsidiary books: purchase book, sales book, purchase return books ales return book, its advantages–Importance, Cash Book–definition – Kinds of cash book, single column, double column.	15
V	**Final Accounts** Final Accounts (without adjustments):Trading a/c–definition-need-preparation-profit & loss a/c and Balance Sheet.	15

4. Book for Study:

 1. Dr.Peer Mohamed and Dr.Shazuli Ibrahim, Advanced Accountancy-I, Pass Publications, 2016.

5. Book for Reference:

 1. Jain S.P.and Narang K.L, Financial Accounting, Kalyani Publishers, New Delhi, 2010.
 2. Maheswari S.N. and Maheswari S.K., Fundamentals of Accounting, Vikas Publishing House, New Delhi, 2005.

6. Teaching Learning Methods:

  (PPT, GD, Seminar, Brain Storming, Case Study, Assignments etc.,)

7. Course Outcome (CO)

  On completion of the course, students should be able to
  1. Describe the students to know the basic concepts of accounting.
  2. Identify the skill stop reparing journal entries.
  3. Discover the preparation of Ledger and concepts of single entry system.
  4.   Discover the knowledge in Preparing subsidiary books and cashbooks.
  5. Identify the concepts of final accounts and prepare it.

8. Course Outcome Level (Preferable one for each objective)

CO1   - K_3
CO2   - K_3
CO3   - K_3
CO4   - K_3
CO5   - K_3

9. 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
CO1	3	2	1		3	3	3	2	1					18
CO2	2	2	3	3	1	2	1	2	2					18
CO3	1	2	2	2		2	1	2	3	3				18
CO4	2	3	2	2	1	2	3	1	2	1				19
CO5	3	1	3	2		3	3	2	1	1				19
Grand Total of COs with PSOs and POs														92
Mean Value of Cos with PSO and POs														2.04

*: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
Meanvalue of Cos With PSOs and POs			**2.04**
Observation	**COs of BUSINESS ACCOUNTING Strongly related with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF IT&M

Class	: IIIT &M	Part	: NME- 1
Semester	: III	Hours	: 45
Subject Code	: 22UITN13	Credits	: 2

IMAGE EDITING TOOLS

1. **Title of the Paper** :IMAGE EDITING TOOLS

2. **Course Educational Objectives (CEO)**
   1: Knowing the basic concepts and Introduction of Photoshop
   2: Empathetic the importance, File Formats and Cropping
   3: Education the features of Retouching photographs
   4: Realizing the concept of main adding Clouds and spot lights
   5:Case Study of applying transformation

3. **Five Units of the Syllabus**

UNIT	Content	No. of Hours
I	**Introduction to Photoshop CS:** Image Editing Theory–Photoshop desktop–File Handling– Units & Rulers– Memory and Image Cache–File Browser.	9
II	**Image Management**: How Images Work – Resolution of Screen Images– How to Open – Duplicate and Save Images. File Formats Roundup–Resampling and Cropping.	9
III	**Painting and Retouching:** Selecting and Editing Colors–Working in different Color Modes–Brush Size and Shape–Filling selection with Color or Pattern–Retouching photographs.	9
IV	**Selections and Paths:** Selection Fundamentals–Moving and duplicating Selection-draw and edit path – Filter basics – Noise factors – adding Clouds and spotlights.	9
V	**Working with Layers:**Layer basics – Moving, Linking, Aligning layers-Applying transformations-Modifying and saving effects-Correcting camera raw images–Organizing images for output.	9

4. Book for Study:
   1. Deke McClell and, 2005, Photoshop8 CS Bible- Wiley Dream tech India Pvt Ltd.

5. Book for Reference:
   1. Barbara Obermeier, 2010, Photoshop CS5 by Wiley Publishing Inc., Indiana polis, Indiana.

6. Teaching Learning Methods:

(PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

7. Course Outcome(CO)

On completion of the course ,students should be able to

CO1: Distinguish with basic concepts of Photoshop

CO2: Extend knowledge about the How Images Works

CO3: Locate Retouching photographs

CO4: Describe the Filter basics concepts.

CO5: Discover the Knowledge about the Working with Layers in Flash

8. Course Outcome Level (Preferable one for each objective)

CO1   - K_3

CO2   - K_3

CO3   - K_3

CO4   - K_3

CO5   - K_3

9. 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
CO1	2	3		1	3	3	3	1	1					17
CO2	3	2	2	3	1		2	3	2					18
CO3	1	3	2	3		2	1	1	2	2				17
CO4	2	2	2	3	1	3	2	2	1					18
CO5	3	3	2	2		1	2	1	2	1				17
Grand Total of COs with PSOs and POs														87
Mean Value of COs with PSO and POs														2.02

*: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
Meanvalue of Cos With PSOs and POs			2.02
Observation	**COs of IMAGE EDITING TOOLS Strongly related with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR- 625 514

DEPARTMENT OF IT&M

Class   : III T &M   Part   : SBE-1

Semester   : III   Hours   : 45

Subject Code : 22UITS13   Credits   : 2

BUSINESS LAW

1. **Title of the Paper** : **BUSINESS LAW**

2. **Course Educational Objectives (CEO)**
   1: Understanding the basic concepts of Business Law
   2: Comprehend the essentials of a Valid Acceptance and Need for consideration
   3: Learning the Void Agreements and Law of Sale of Goods
   4: Study the concept of Law of Partnerships
   5: Knowing the kinds of Negotiable and Non Negotiable Instruments

3. **Five Units of the Syllabus**

UNIT	Content	No. of Hours
I	**Introduction to Law of Contract** Meaning–Definition–Nature of Contracts–Classification of Contracts–Essential Elements of a Contracts––Contingent Contract–Discharge of Contract –––Contract of Indemnity–Contracts of Guarantee.	9
II	**Offer and Acceptance and Consideration** Offer and Acceptance – Rules governing Offers – Rules governing Acceptance- Essentials of a Valid offer-Essentials of a Valid Acceptance –When does an Offer or Acceptance come to an End- Consideration – Need for Consideration- Essential elements of a valid Consideration––Types of Consideration.	9
III	**Void Agreements and Law of Sale of Goods** Void Agreements-Expressly declared Void– Contract of Sale of Goods – Essentials of a contract of sale –Distinction between Sale and Agreement to sell–Duties of Buyer and Seller.	9
IV	**Law of Partnerships** Introduction- Meaning- Characteristics of Partnership kinds of partnership–Registration of Partnership firms – Partnership Deed-Duties and Liabilities of Partners–Dissolution of Partnership.	9

	Law of Negotiable Instruments Introduction-Meaning-Kinds of Negotiable instruments - Features - Non-Negotiable Instruments –Bill of Exchange–Promissory Note–Cheque-Distinction between Promissory note and Bill of Exchange.	
V		9

4. Book for Study:
1. N.D.Kapoor, Elements of Mercantile Law–Sultan Chand & Sons, New Delhi-37th Revised Edition, 2015.

5. Book for Reference:
1. L.M.Porwal, Sanjeev Kumar, Business Laws, Vrinda Publication (P)Ltd., Delhi, First Edition,2006.
2. R.S.N.Pillai and Bagavathi "Business Law, Sultan Chand & Company Ltd, New Delhi, Revised Edition, 2009.

6. Teaching Learning Methods:
(PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

7.Course Outcome (CO)
On completion of the course, students should be able to
1. Identify the Basic Concepts different Laws in Business
2. Distinguish the Valid offer and Valid Acceptance
3. Convert the Void Agreements and Sales Agreements
4. Discover the Registration of Partnership firms
5. Distinguish the Negotiable Instruments with Non-Negotiable Instruments

8. Course Outcome Level(Preferable one for each objective)
CO1 -K_3
CO2 -K_3
CO3 -K_3
CO4 -K_4
CO5 -K_3

9. 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
CO1	3			2	3	3	3	2	1					17
CO2	2	2	3	2	1		3	2	3					18
CO3	1	2	2	3		3	1	2	1	3				18
CO4	2	3	3	2	1	3		2	2	1				19
CO5	3	3	2	3		2	3	3						19
Grand Total of COs with PSOs and POs														**91**
Mean Value of Cos with PSO and POs														**2.28**

*: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
Meanvalue of COs With PSOs and POs			2.28
Observation	COs of BUSINESSS LAW Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514.

DEPARTMENT OF IT&M

Class	: IIIT &M	Part	:Self Learning
Semester	: III	Hours	:-
Subject Code	: 22UITSL3	Credits	:3

SCRIPTING LANGUAGE

1. Title of the Paper: **SCRIPTING LANGUAGE**

2. Course Educational Objectives (CEO)

    1: Knowing the basic concepts of HTML

    2: Getting to Know the Forms & Frame concepts.

    3: Able to learn DHTML & XML

    4: Able to learn Basic Java Script.

    5: Able to learn the Basic PHP concepts.

3. Five Units of the Syllabus

UNIT	Content	No. of Hours
I	**Introduction to HTML:**–Outline of HTML Document –Head Section: Link– Base–Meta–Script–Style. HTML Body Section: Headers–Paragraphs–Text Formatting–Linking.	-
II	**HTML OtherT ags:** Embedding Images –HTML Lists–Tables–Frames–Forms other special Tags and Characteristics.	-
III	**DHTML & XML:** CSS – coding CSS–Property of Tags–Property values–Backgrounds – DHTML DOM and Collections. XML: Introduction–HTML vs XML–Syntax of XML Document–XML Attributes–Validations.	-
IV	**Java Script:** Need for a Scripting Language–Language Elements: Identifiers, Expressions, Java Script Keywords, Operators, Functions. Objects of Java Script: The Window Object, Document Object, Forms Object.	-
V	**PHP:** Introduction–PHP tags–Comments–Print and echo Statements–Variables–Data Types–Arrays –User defined Functions.	-

4. Book for Study:

  1. N .P. Gopalan 2014, Web Technology – A Developer's Perspective, PHI Learning Private Limited, Delhi–110092.

5. Book for Reference:

  1. Thomas A Powell, 2006, "HTML: The Complete Reference", Osborne/McGraw-Hill.

6. Teaching Learning Methods:

(PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

7.Course Outcome (CO)

On completion of the course, students should be able to

1: Distinguish Strong knowledge about the HTML Features.

2:Demonstrate the Forms &Frame concepts.

3: Illustrate the CSS using DHTML & XML.

4: Discover the Knowledge about the Working with Java Script.

5:Relate Work with PHP concepts.

8. Course Outcome Level (Preferable one for each objective)

CO1   -K_3

CO2   -K_3

CO3   -K_3

CO4   -K_3

CO5   -K_3

9. 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
CO1	2	3	3		2	3	2	1	2					18
CO2	3	2	3	2	3	2	1	1	1					18
CO3	2	3	2	3		1	2	1	2	2				18
CO4	3	2	2	2	1	1	2	1	2	2				18
CO5	2	3	3	2		3	1	2	2	1				19
Grand Total of COs with PSOs and POs														91
Mean Value of COs with PSO and POs														2.02

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
Meanvalue of COs with PSOs and POs			2.02
Observation	COs SCRIPTING LANGUAGE Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF IT&M

Class	: II IT &M	Part	: Core-8
Semester	: IV	Hours	: 60
Subject Code	: 22UITC84	Credits	: 4

ORGANIZATIONAL BEHAVIOUR

1. **Title of the Paper: ORGANIZATIONAL BEHAVIOUR**

2. **Course Educational Objectives (CEO)**
   1: Understanding the basic concepts of Organizational Behaviour and Perception
   2: Knowing the Principals of Learning and Functions of Attitude
   3: Studying the types of Group and sources of Stress
   4: Impart the Knowledge of theories of Motivation and Resolving Conflict
   5: Comprehending the importance of organizational change and Pre-requisites for OD

3. **Five Units of the Syllabus**

UNIT	Content	No. of Hours
I	**Introduction of Organizational Behaviour** Organizational Behaviour–Definition-Nature and Scope– Need–Perception Process, determinants, factors affecting perception	12
II	**Individual Behaviour** Individual Behaviour–Personality–Concept Determinants– Types, Learning–Definition–Classical conditioning– Principles of learning–Attitudes—Formation of attitudes- Functions of attitudes.	12
III	**Group Behaviour and Motivation** Group behavior–Definition–Characteristics–Types– Reasoning for joining in group –Stages of group formation–Group norms–Group cohesion–Group decision making-Motivation-Definition and meaning–Maslow's Theory Herzberg Theory.	12
IV	**Organizational conflict and Stress Management** Conflict-Definition-Sources, types, Resolving Conflicts. Stress-Meaning and definition–Causes of stress, Sources of stress–Overcoming the stress.	12
V	**Organizational change and Development** Organizational change–Need for organizational changes, types of changes–Resistance to change managing resistance to change–Organizational Development– objectives of OD – Characteristics of OD.	12

4. Book for Study:
1. K. Aswathappa "Organizational Behaviour", Himalaya publishing House Pvt. Ltd., Mumbai, Ninth Revised Edition, 2010.

5. Book for Reference:
1. L. M. Prasad "Organizational Behaviour", Sultan Chand & Sons, NewDelhi-4th Revised Edition, 2006.
2. S. S. Khanka, "Organizational Behaviour", Sultan Chand & Sons, NewDelhi-3rd Edition, 2005.

6. Teaching Learning Methods:
   (PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

7. Course Outcome (CO)
   On completion of the course, students should be able to
1. Describe the Basic Concepts of Organizational Behaviour
2. Discover learning skills and attitudes
3. Distinguish the different Groups and Norms
4. Compare the theories of Motivation and Resolving Conflict
5. Infer the Organizational Development and Organizational Resistance

8. Course Outcome Level (Preferable one for each objective)
CO1   - K_3
CO2   - K_4
CO3   - K_3
CO4   - K_3
CO5   - K_3

9. 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
CO1	3	3		1	2	3	3	3	1					19
CO2	2	2	2	3	1	2	3		3	1				19
CO3	2	2	2	3		3	1	2	1	3				19
CO4	2	3	3	2	3		2	1	3	1				20
CO5	3	2	3	3		3		2	3	1				20
Grand Total of COs with PSOs and POs														97
Mean Value of COs with PSO and POs														2.26

*: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
Meanvalue of COs With PSOs and POs			**2.26**
Observation	**COs of ORGANIZATIONAL BEHAVIOUR Strongly related with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514

DEPARTMENT OF IT&M

Class	: III IT &M	Part	: III Core-9
Semester	: IV	Hours	: 75
Subject Code	: 22UITC94	Credits	: 04

COMPUTER NETWORKS

1. **Title of the Paper**: **COMPUTER NETWORKS**

2. **Course Educational Objectives (CEO)**

1: To be familiar with basic concepts of Communication and Networking.

2: Impart the knowledge Transmission Media and its types.

3: Know about the Error Correction and Detection.

4: To gain comprehensive knowledge about Connecting Devices.

5: To be aware of Security and Cryptography.

3. **Five Units of the Syllabus**

UNIT	Content	No. of Hours
I	**Introduction** Introduction to data communication and networking – Data Communication - Classification of Network - Protocols and Standards – Standards Organizations –Internet Standards -TCP/IP Protocol Suites –OSI Reference Model.	15
II	**Layers in Networks** Physical Layer – Data Link Layer – Transport Layer – UDP. Transmission Media**:** Guided Media – Unguided Media and its Applications.	15
III	**CONNECTING DEVICES** Passive Hubs - Repeaters –Active Hubs –Bridges –Routers – Distance Vector Routing Algorithm – Link State Routing –Gateway – Shortest Path Routing.	15
IV	**Errors** Introduction about Errors - Types of Errors, Detection - Parity Check –Vertical Redundancy Check –Longitudinal Redundancy Check –Cyclic Redundancy Check –Checksum –Error Correction.	15
V	**Security** Cryptography - Two Categories–SYMMETRIC-KEYCRYPTOGRAPHY: Traditional Ciphers - Simple Modem Ciphers -Modern Round Ciphers - Mode of Operation.	15

4. **Book for Study:**

1. Behrouz A Foruzan, ”Data Communications and Networking” 4th Edition, Tata Mc Graw-Hill, 2009.

5. **Book for References:**
   1. Andrew S.Tanenbaun, "Computers Networks",4th Edition, Pearson Prentice Hall, 2009.

6. **Teaching Learning Methods:**
   (PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

7. **Course Outcome (CO)**

On completion of the course, students should be able to

CO1: Describe the basic concepts of Communication and Networking.

CO2: Discover the knowledge about the Transmission Media.

CO3: Solve the Error Detection and Correction.

CO4: Manipulate the Connecting Devices.

CO5: Discriminate about the Security.

8. **Course Outcome Level** (preferable one for each objective)

CO_1 - K_3
CO_2 - K_3
CO_3 - K_3
CO_4 - K_4
CO_5 - K_3

9. **Mapping Course Outcome with**
   1. Programme Specific Objectives –**PSO (put tick mark in the correlating box)**
   2. Programme Objectives –**PO (put tick mark in the correlating box)**

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	1	2		3	3	3	2					20
CO2	3	3	3	2	1	3	3	3	1					22
CO3	2	3	2	3	2	2	3	1	3	2				23
CO4	2	3	3	2		2	2	2	2	1				19
CO5	3	3	2	2	3	3	2	2	2	1				23
Grand Total of COs with PSOs and PO														107
Mean Value of COs with PSO and PO														2.33

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
Meanvalue of COs with PSOs and POs			2.33
Observation	COs of COMPUTER NETWORKS Strongly related with PSOs and PO		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF IT&M

Class	: IIIIT &M	Part	: Core– 10
Semester	: IV	Hours	: 75
Subject Code	: 22UITD04	Credits	: 4

DOT NET PROGRAMMING

1. **Title of the Paper** : **DOT NET PROGRAMMING**

2. **Course Educational Objectives (CEO)**
   i. Understand Visual C# Features, Environment and Controls.
   ii. Understand C# Essentials and Tokens.
   iii. Able to code in C# Environment
   iv. Able to learn working with C# and Database.
   v. Able to learn web forms.

3. **Five Units of the Syllabus**

Unit	Content	No. of Hours
I	**C# Introduction and Controls** **Introduction:** C# and other Languages – Installing Visual C# - IDE – Your First Application – Toolbox – property Editor -Visual C# forms – events –setting properties in code – A C# adding machine – Dealing with errors. **Controls:** Methods- Buttons, Labels, Text, picture boxes, Check & Radio Boxes - Group, List, Combo boxes - Timer, Open File Dialog and Tab Control- Splitter Control-Using Toolbar-Month Calendar Control.	15
II	**C# Essentials** **Language Essentials:** Parts of C# file – Data types-function and Parameters – variables & scope – IF...Else, do and while, for loops, switch – Arrays, Structs, Usingenum, Understanding reference types-working with parameters. **Visual Studio Tools:** Creating, Customizing a menu, Pop-up menu-outlining& Auto insertion- using Clip board ring – using Find – Debugger –breakpoints – Customizing Tool box – Using Add-in Manager – Setting Visual C# Options–Project Properties- creating Stand Alone applications.	15
III	**C# Techniques** Catching errors with exceptions – user validation-Use tool tips-Printing with Visual C# - Managing multiple forms- Introducing MDI – Starting C# application – How to read and write a file- Drawing Graphics – Creating a shared Event Handler–Interrupt With Do Events-Using a Setup Project.	15

IV	**Creating Database Programs** Introducing Databases- creating Databases with access- Designing a table-Data form Wizard – Improving Data Form- Disconnected data – Data base objects–Showing data in Grid- Styling a Data grid-Dealing with large database-Copying record to clipboard-creating and showing a report.	15
V	**Running C# on the Internet** Introducing Web Forms- Creating a Web Form – How web Forms Work - Web Forms Toolbox-The page Class and code-behind-The Load event and is Post Back –The Session object-ASP.Net and Database-Showing data in a Data Grid.	15

4. **Book for Study:**

Tim Anderson, "C# Programming in easy steps", Dream Tech Press, New Delhi – 02.
Unit–I:**Chapters 1,2** pages 08 -20 & 28 –47,
Unit–II:**Chapters 4,5** pages 51-73 & 96 -115
Unit–III:**Chapters 6** Pages118–140,
Unit–IV:**Chapters 7** Pages146-169
Unit–IV:**Chapters 8**,Pages 172 –187

5. **Book for References:**

1. Christian Nagel, Bill Evjen, Jay Glynn, Karli Wats, Morgan Skinner, Allen Jones, 2005-PROFESSIONAL C# WITH.NET3.0-By –Copyright John Wiley.
2. Rudrakash Batra, Charual Shukla-ASP.NET2.0 Black Book-Dream Tech Press, New Delhi–110002.

6. **Teaching Learning Methods:**

(PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

7. **Course Outcome (CO)**

On completion of the course, students should be able to

1: Utilize the knowledge about ASP C# Dot Net Environments.
2: Apply the basics of C# Essentials (Tokens, control structures).
3: Compute the knowledge about C# Techniques (Error Handling, Multiple Forms, Graphics)
4: Ability to create &Connect Data base using C#.
5: Design Web Forms and web Pages.

8. **Course Outcome Level** (preferable one for each objective)

CO1   - K_3
CO2   - K_3
CO3   - K_4
CO4   - K_3
CO5   - K_3

9. **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)**

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		3	2	2	1					18
CO2	2	2	2	2	1	2	2	2	2	2				19
CO3	2	3	2	3	3	2	2	1	2	2				22
CO4	3	2	3	3	1	3	3	2		1				21
CO5	3	3	2	2		3		3	3	2				21
Grand Total of COs with PSOs and PO														101
Mean Value of COs with PSO and PO														2.24

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
Meanvalue of COs with PSOs and POs			2.24
Observation	**COs of DOT NET PROGRAMMING Strongly related with PSOs and PO**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF IT&M

Class	: III IT&M	Part	: III Lab-4
Semester	: IV	Hours	: 75
Code	: 22UITPA44	Credit	: 04

PROGRAMMINGIN DOT NET LAB-5

1. **Title of the Paper**: **PROGRAMMING IN DOT NET LAB-5**

2. **Course Educational Objectives (CEO)**
    i. Understand Visual C# Features, Environment and Controls.
    ii. Understand C# Essentials and Tokens.
    iii. Able to code in C# Environment
    iv. Able to learn working with C# and Database.
    v. Able to learn web forms.

3. **Five Units of the Syllabus**

Unit	Content	No. of Hours
I	Your First Application–Visual C# forms–Using Tool Box controls:	12
II	Using Function and Parameters–IF...Else, do and while, for loops, switch –Arrays, Structs, Usingenum.	15
III	Design Stylish attractive Menus –AD Rotator– Rotation Animation– Using CSS, Attractive Background Design.	18
IV	**C**reating Databases with access- Designing a table- Using Grid View - Using Data List -Using Details View - Using Form View - Using List View –Using Repeater & Data Pager.	16
V	Creating a Web Form- Web Forms Tool box-Using Session objects	14

4. **Book for Study:**
   Tim Anderson, "C# Programming in easy steps", Dream Tech Press, New Delhi –02.

5. **Book for References:**
   1. Christian Nagel, Bill Evjen, Jay Glynn, Karli Wats, Morgan Skinner, Allen Jones, 2005-PROFESSIONAL C# WITH.NET3.0-By –Copyright John Wiley.
   2. Rudrakash Batra, Charual Shukla-ASP.NET2.0 Black Book-Dream Tech Press, New Delhi–110002.

6. **Teaching Learning Methods:**
   (PPT, GD, Seminar, Quiz Programme, Brain Storming, Case Study, Assignment etc.)

7. **Course Outcome (CO)**
   On completion of the course, students should be able to
      1: Compose the knowledge about ASP C# Dot Net Environments.
      2: Apply the basics of C# Essentials (Tokens, control structures).
      3: Utilize knowledge about C# Techniques (Error Handling, Multiple Forms, Graphics)

4: Create & Connect Database using C#.

5: Construct Web Forms and web Pages.

8. **Course Outcome Level** (preferable one for each objective)

CO_1 - K_3
CO_2 - K_4
CO_3 - K_3
CO_4 - K_3
CO_5 - K_3

9. **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)**

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	3		3	3	3	1					22
CO2	2	2	3	3	2	2	2	3	3	2				24
CO3	2	3	2	2	3	2	3	2	3	2				24
CO4	3	2	3	3	2	3	3	3	2	1				25
CO5	3	3	3	2	2	3	1	2	3	3				25
Grand Total of COs with PSOs and PO														**120**
Mean Value of COs with PSO and PO														**2.5**

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
Meanvalue of COs with PSOs and POs			**2.5**
Observation	**COs of PROGRAMMING IN DOT NET LAB -5 Strongly related with PSOs and PO**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR-625 514
DEPARTMENT OF IT&M

Class	: ITM	Part	: Allied - 4
Semester	: IV	Hours	: 75
Subject Code	: 22UITA44	Credits	: 4

WEB MARKETING

1.Title of the Paper: WEB MARKETING

2. Course Educational Objectives (CEO)

   1: Understand the Digital Marketing basics.
   2: Able to ranking, searching your web data through SEO.
   3: Understand the various social media platforms
   4: Understand how to influence business through web marketing.
   5: Understand the techniques of video advertising.

3. Five Units of the Syllabus

UNIT	Content	No. of Hours
I	**Introduction to Digital Marketing** Principles of Digital Marketing- Digital Marketing Channels-Tools to Create Buyer Persona- Competitor Research Tool-Website Analysis Tools	**15**
II	**Search engine optimization** Search Engine Optimization fundamentals -Keywords and SEO- Content Plan SEO and Business Objectives -Writing SEO Content -On-site and Off-site SEO Optimize -Organic Search Ranking	**15**
III	**Social Media Marketing** Major Social Media Platforms for Marketing- Developing Data-driven Audience & Campaign Insights- social media for Business- Creation & Optimization of Social Media Campaigns	**15**
IV	**Influencer Marketing** Content Marketing Concepts & Strategies- Planning, Creating, Distributing and Promoting Content- Optimize Website UX and Landing Pages- Measure Impact- Metrics & Performance Using Content Research for Opportunities	**15**
V	**Video Advertising** Creating Video Campaigns-Measurement and Optimization-Creating and Managing a YouTube Channel- Targeting Video Campaigns- Digital Marketing Budget and Plan;-Resource Planning- Cost Estimating- Cost Budgeting-Cost Control	**15**

4.Book for Study:
   i. https://leverageedu.com/blog/digital-marketing-course-syllabus/

5.Book for Reference
  i. https://collegedunia.com/courses/digital-marketing/syllabus#a
6.TeachingLearningMethods:
(PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)
7.Course Outcome (CO)
On Successful completion of the course the students able to
  i. Translate some of the key marketing and business models that will help to shape your Web marketing strategy.
  ii. Outline an approach to developing a Web marketing plan
  iii. Explain the key web marketing activities needed for competitive success
  iv. Discuss the opportunities and risks of integrated web marketing
  v. Knowledge about Video advertising.
7. Course Outcome Level (preferable one for each objective)

CO_1	-	K_3
CO_2	-	K_4
CO_3	-	K_3
CO_4	-	K_3
CO_5	-	K_3

8. 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)**

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	3		3	3	3	1					22
CO2	2	2	3	3	2	2	2	3	3	2				24
CO3	2	3	2	2	3	2	3	2	3	2				24
CO4	3	2	3	3	2	3	3	3	2	1				25
CO5	3	3	3	2	2	3	1	2	3	3				25
									Grand Total of COs with PSOs and PO					120
									Mean Value of COs with PSO and PO					2.5

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
Meanvalue of COs with PSOs and POs			2.5
Observation	COs of Web Marketing Strongly related with PSOs and PO		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF IT&M

Class   : II   Part   : IV NME-2
Semester   : IV   Hours   : 45
Subject Code : 22UITN24   Credits   : 2

ETHICAL HACKING

1. Title of the Paper: ETHICAL HACKING

2. Course Educational Objectives (CEO)
   1: Understanding the basic Ethical Hacking types.
   2: Discriminate Foot printing process.
   3: Understanding the Social Engineering and Phishing Types.
   4: Able to learn various Hacking Methods.
   5: Able to learn various protection systems.

3. Five Units of the Syllabus

UNIT	Content	No. of Hours
I	**Introduction to Ethical Hacking:** Ethical Hacking Overview, Types of Hacking, Advantages of Hacking, Disadvantages of Hacking, Hacker types.	9
II	**Reconnaissance & Foot Printing**: Reconnaissance overview Active, Passive Reconnaissance. Foot Printing Overview Domain Name Information - Finding IP Address - Finding Hosting Company - IP Address Ranges - History of the Website.	9
III	**Social Engineering, Phishing & DoS:** Social Engineering Overview - Social Engineering Types. Phishing introduction – Phishing types. Denial Of Service Overview – DoS Attack Symptoms – Counter measures against DoS	9
IV	**Ethical Hacking & Hijacking** System Hacking, Hacking Web Application, Hacking Web Servers, Session Hijacking, Hacking Wireless Networks, Hacking Mobile Platforms.	9
V	**Network Protection Systems** Understanding Routers – Firewalls – Intrusion detection and Prevention systems – Web Filtering – Security Incident response team – Honey Pots.	9

4. Book for Study:
   1. "**Hands-On Ethical Hacking and Network Defense**" Michael T. Simpson, Kent Backman, and James E. Corley,ISBN-13: 978-1-133-93561-2, Course Technology, a part of Cengage Learning, 20 Channel, Center Street Boston, MA 02210 USA.

5. Link for Web Reference:
   1. https://www.tutorialspoint.com/ethical_hacking/ethical_hacking_wireless.htm
   2. https://www.w3schools.in/ethical-hacking

6. Teaching Learning Methods:
   (PPT, GD, Seminar, Quiz programme, Brain Storming, Case Study, Assignments etc.,)

8. Course Outcome (CO)
   1. Understand the Ethical Hacking types.
   2. Applying the knowledge of foot printing to display IP address, Web Location and etc.
   3. Knowledge about various phishing and Social Engineering types.
   4. Knowledge on the various Hacking methods.
   5. knowledge on the protection Systems

9. Course Outcome Level (Preferable one for each objective)

CO1	-	K_3
CO2	-	K_3
CO3	-	K_3
CO3	-	K_3
CO3	-	K

10. 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
CO1	3	3	1	2		3	3	3	2					20
CO2	3	3	3	2	1	3	3	3	1					22
CO3	2	3	2	2	2	2	3	1	3	2				22
CO4	2	2	2	1		2	2	2	2	1				16
CO5	3	3	2	2	3	3	2	2	2	1				23
Grand Total of COs with PSOs and PO														**103**
Mean Value of COs with PSO and PO														**2.24**

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
Meanvalue of COs with PSOs and POs			**2.24**
Observation	**COs of Ethical Hacking Strongly related with PSOs and PO**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF IT&M

Class	: IIIT &M	Part	: SBE-2
Semester	: IV	Hours	: 45
Subject Code	: 22UITS24	Credits	: 2

BUSINESS STATISTICS

1. **Title of the Paper**: **BUSINESS STATISTICS**
2. **Course Educational Objectives (CEO)**
   1. Understanding the basic concepts and Introduction of Statistics.
   2. Knowing the importance of collection of data.
   3. To understand and to calculate various Measures of central tendency.
   4. To study the concepts of set theory.
   5: To learn the methods of Time Series Analysis.

3. Five Units of the Syllabus

UNIT	Content	No. of Hours
I	**Introduction to Statistics:** Introduction; Statistics and Statistical Methods; Definition-characteristics- Functions of Statistics-Scope-Limitations of Statistics-Statistics in Business and Management-Distrust of statistics.	9
II	**Collection of Data:** Primary and secondary data; methods of collecting primary data, Questionnaire – Concepts, Specimen of questionnaire, Principles-qualities of good questionnaire, sources of secondary data.	9
III	**Measure of Central Tendency:** Introduction; Measures of Central Tendency. Definition, objectives, types of average, Mean, Median and Mode, simple arithmetic mean: Individual observation, discrete series, and continuous series, Median: Individual observation, discrete series, continuous series, Mode-individual observation.	9
IV	**Set Theory:** Introduction; Concepts of Set theory; Representation of sets, types of sets, set operations, union of sets, intersection of sets, difference of two sets, complement of set.	9
V	**Time Series Analysis:** Introduction-Concepts and definition of Time Series; Importance, Uses – Components-Measurement of secular trend; Graphic method, semi average method, moving average method (not even periods).	9

4. Book for Study:
1. K Alagar, Business Statistics, Mc Graw Hill Education (india) Private Limited, New Delhi.
2. S.A. N. Shazuli Ibrahim, Business Statistics, Pass Publication, Madurai.

5.Book for Reference:
  i.Pillai R.S.N. and Bagavathi, Statistics-Theory and Practice, S.Chand and Company Pvt. Ltd New Delhi.
  ii.V.Sunderesan, Business Mathematics, S.Chand and Company Pvt. Ltd, New Delhi.

6. Teaching Learning Methods:
  (PPT, GD, Seminar, Brain Storming, Case Study, Assignments etc.,)

7. Course Outcome(CO)
   On completion of the course, students should be able to
1. Illustrate the students to know the basic concepts of Statistics.
2. Describe the concept about data classification and Data Collection Methods.
3. Discover to Knowing the techniques of measures of central tendency.
4. Identify the knowledge in set theory.
5. Discover concepts of Variations in Time Series.

8. Course Outcome Level (Preferable one for each objective)
   CO1   - K_3
   CO2   - K_3
   CO3   - K_3
   CO4   - K_3
   CO5   - K_3

9. 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
CO1	3	2	1		2	2	3	2	1	2				18
CO2	3	3	3	3	2	2	1	2		1				20
CO3	2	3	3	3		3	1	3	2					20
CO4	3	2	2	2	3	3	2	2	1	1				21
CO5	3	3	3	3		1	3	2	2	1				21
Grand Total of COs with PSOs and POs														100
Mean Value of COs with PSO and POs														2.22

*: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
Meanvalue of COs With PSOs and POs			2.22
Observation	COs of BUSINESS STATISTICS Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.

DEPARTMENT OF IT&M

Class   : U.G.(SFC)   Part   : Self Learning

Semester   : IV   Hours   :--

Subject Code : 22UITSL6   Credits : 03

STRESS MANAGEMENT

1. Title of the Paper: **STRESS MANAGEMENT**

2. Course Educational Objectives (CEO)

1. Understanding the basic concepts and Introduction of Stress.
2. Knowing the importance of stress influence.
3. To understand the stress effects.
4. To study the various stress influence concepts.
5. To learn the methods of Employer.

3. Five Units of the Syllabus

UNIT	Content	No. of Hours
I	Introduction-causes of Stress–Symptoms-Potential Sources of Stress –Stress Level – Stress Types.	-
II	Stress and its influences on Employee Behavior– Key time Working-Flexibility –Multi Skilling– Sources of work Stress.	-
III	Stress and its effects on employee changes – Effects on Management–Stress Management Strategies–Managing Stress & Reducing the Stress.	-
IV	Influence of stress on occupation – Physiological influences – Coping with Stress–Coping Mode-Burn Out–Causes–Symptoms-Reducing Burn Out.	-
V	Violence at work - Employer Welfare–Stress Interview–Administering the Interview	-

4. Book for Study:

1) Dr.Andrew Goliszek, "Stress Management", Magna Publishing Company Limited, Chennai.

5. Book for Reference:

1) Barry L.Reece & Rhonda Brandt, "Effective Human relations in Organisations", 1997, VI Edition, All India Publishers & Distributors, Chennai.
2) Prasad L.M, "Organisation Behaviour", Sultan Chand & Sons, New Delhi.

6. Teaching Learning Methods:

(PPT, GD, Seminar, Brain Storming, Case Study, Assignments etc.,)

7. Course Outcome (CO)

On completion of the course, students should be able to

1. Illustrate the causes of stress.
2. Describe the concept about Employee Behaviour.
3. Discover to reduce the stress Management.
4. Discover the techniques to rectify the stress.
5. Identify the knowledge of employer welfare.

8. Course Outcome Level (Preferable one for each objective)

CO1	-	K_3
CO2	-	K_3
CO3	-	K_3
CO4	-	K_3
CO5	-	K_3

9. 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
CO1	3	2	1		2	2	3	2	1	2				18
CO2	3	3	3	3	2	2	1	2		1				20
CO3	2	3	3	3		3	1	3	2					20
CO4	3	2	2	2	3	3	2	2	1	1				21
CO5	3	3	3	3		1	3	2	2	1				21
										Grand Total of COs with PSOs and POs				100
										Mean Value of COs with PSO and POs				2.22

*: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
Meanvalue of COs With PSOs and POs			**2.22**
Observation	COs of Stress Management Strongly related with PSOs and POs		

DEPARTMENT OF PHYSICAL EDUCATION

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514
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.

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)

Part	Subject Code	Nature of the Paper	Paper	Hours	Credit
I SEMESTER
I	22UTAL11		Tamil / Hindi / French	06	04
II	22UENB11		English	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		Skill Based Elective	03	02
	22UFCE11		Foundation Courses	01	01
	22UBRC11		Bridge Course	-	01
	22UCSH12		Communication Skill	01	-
V			Extension Activities	-	-
				30	**21**
II SEMESTER
I	22UTAL22		Tamil / Hindi / French	06	04
II	22UENB22		English	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		Skill Based Elective	03	02
	22UFCH22		Foundation Courses	01	01
	22UCSH12		Communication Skill	01	01
V			Extension Activities	-	01
				30	**25**
III SEMESTER
I	22UTAL33		Tamil / Hindi / French	06	04
II	22UENB33		English	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
			Practical: Track & Combined Events	02	02
IV	22UPEN13	NME - 1	Fitness and Wellness	03	02
	22UFCE33		Foundation Courses	01	01
V			Extension Activities	-	-

	22UARE14		ARISE	-	-
				30	**21**
			IV SEMESTER		
I	22UTAL44		Tamil / Hindi / French	06	04
II	22UENB44		English	06	04
	22UPEC44	Core - IV	Theories of Game - IV	05	05
	22UPEP44		Practical: Game IV	04	04
	22UPEA44	Allied - IV	Field Events	03	02
			Practical: Field Events	02	02
IV	22UPEN24	NME - 2	Fundamentals of yoga	03	02
	22UFCH44		Foundation Courses	01	01
V			Extension Activities	-	01
			ARISE	-	01
				30	**26**
			V SEMESTER		
III		Core– V	Research Methodology & Statistics in Physical Education	05	04
		Core - VI	Science of Sports Training	05	04
		Core - VII	Methods in Physical Education	05	04
		Core – VIII	Test, Measurement & Evaluation in Physical Education	03	02
			Practical: Test, Measurement & Evaluation in Physical Education	02	02
		Core – IX	Teaching Practice - Practical	05	03
		Core Elective 1A	Exercise Physiology	03	03
		Core Elective 1B	Sports Journalism		
			Internship	-	01
			Soft Skills	02	-
				30	**23**
			VI SEMESTER		
III		Core – X	Kinesiology and Biomechanics in Physical Education	05	04
		Core - XI	Sports Management	05	04
		Core - XII	Games of Specialization	03	03
			Practical: Games of Specialization	03	03
		Core – XIII	Yoga for Fitness	03	03
			Practical: Yoga for Fitness	03	03

		Core – XIV	Project	03	03
		Core Elective–2 A	Sports Medicine& First Aid	03	03
		Core Elective–2 B	Sports Psychology & Sociology		
			Soft Skills	02	02
				30	**28**

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	Semester	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
	Marks	**50**

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
	Marks	**50**

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)

Title (Core–3)	**Theories of Games -III (Kho- Kho & Football)**	Course Code	22UPEC33
Class	**II B.Sc (Physical Education)**	Hours	**75**
Semester	**III**	Credit	**04**
Course Educational Objectives(CEO)	• Familiarize the history, their development, organizations and tournaments of Kho- Kho and Football. • Aware the skills of Kho- Kho and Football. • Understand the relationship between fitness components and performance variables. • Know the marking and rules of Kho- Kho and Football. • Realize the concepts in officiating Kho- Kho and Football tournaments.		

Unit	Content	No. of Hours
I	**Kho-Kho:** History and Development –Major Competition - Tournaments - General and Specific Training – Warming up & Warming Down – Essential Fitness components.	15
II	**Kho-Kho:** Ground Marking: - Measurements – Equipment's - Fundamental skills - Advanced skills - Rules and Interpretation.	15
III	**Football**: History and Development – Federations – Important major competition and tournaments Awards - General and Specific Training – Warming up & Warming Down – Essential Fitness components	15
IV	**Football**: Ground marking - Measurements – Equipment's - Fundamental skills - Advanced skills - Rules and Interpretation.	15
V	Mechanism of Officiating: Methods of Officiating – Duties of Officials – Officials signals - Scoring system – Reasoned development in Kho- Kho & Football.	15
Books for Study	1. Thakur, J.K., "Measurement of Playing Field", Sports Publications, New Delhi, 2013.	

Books for Reference	1. Bhari, B., "Layout of Play Field", Sports Publications, New Delhi, 2010. 2. Monika, A., "Kho Kho", First Edition, Sports Publications, New Delhi, 2005. 3. Monika, A., "Football", First Edition, Sports Publications, New Delhi, 2005.

Teaching and learning methods

　　　　Class Lecture, Video Clippings, Diagrams, Demonstration, Group Discussion.

Course Outcome (CO)

On successful completion of the course, the student able to

CO1: Recall the history, organizations and tournaments of Kho-Kho.**(K-1)**

CO 2: Demonstrate the skills, techniques and tactics of Kho- Kho. **(K-2)**

CO3: Remember the history, organizations and tournaments of Football.**(K-3)**

CO 4: Outline the markings and interpret the rules and regulations of the games. **(K-3)**

CO 5: Analyze the method of officiating and scoring system.**(K-5)**

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
CO1	3	3				3	3	3		3				18
CO2	3	3	3			3	3	3	2	3	3	3	2	31
CO3	3	3	2	3		3	3	3		2		1	1	23
CO4	3	3	1		2	3	3	3	3	3	2	2	2	30
CO5	3	3	2		3	3	3	3	1	3	3	3	2	32
Grand Total of COs with PSOs and POs														134
Mean Value of COs with PSO and POs = 114/51														2.23

Strong–3, Medium–2, Low–1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Meanvalue of COs with PSOs and POs			**2.23**
Observation	**COs of Theories of Game –III strongly related with PSOs and POs**		

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)

Title(CorePractical-3)	Practical: Games –III (Kho-Kho & Football)	Course Code	22UPEP33
Class	**II B.Sc.,(Physical Education)**	Hours	**60**
Semester	**III**	Credit	**03**
Course EducationalObjectives(CEO)	- Aware the skills of Kho – Kho and Football. - Understand the relationship between fitness components and perform ancevariables. - Know the marking and rules of Kho- Kho and Football. - To realize the concepts in officiating Kho – Kho and Football tournaments.		
Content			
1. Demonstrate the Fundamental and Advanced skills of the games 2. Skill tests, scoring and arrangement of the skill tests. 3. Rules of the games with their interpretations. 4. Mechanism of officiating - Duties of officials - Officials signals - Scoring system. 5. Coaching- Fundamental and Advanced skills – Lead Up Activities.			
Books for Reference	1. Coaches corner.(Kho-Kho competitions): Anarticle from: Coach and Athletic Director by Gale Reference Team (Oct31,2006) 2. Coaching Football Technical & Tactical Skills (Technical and Tactical Skills Series) by American Sport Education Program (May 18, 2011) 3. Football Coach's Survival Guide:Practical Techniques and Materials for Building an Effective Program and a Winning Team by Sue Gozansky (Nov2001) 4. Gupta, K.; Gupta, Amita, eds. (2006), *Concise Encyclopaedia of India*, 3, New Delhi: Atlantic, p.986,ISBN81-269-0639-1,			

Course Outcome (CO)

On successful completion of the course, the student able to

CO 1: Demonstrate the fundamental and advanced skill of the games. **(K-2)**

CO2: Interpret the rules and regulations of Kho – Kho and Football.**(K-2)**

CO 3: Organize the matches and tournaments of Kho - Kho and Football. **(K-3)**

CO4: Analyze the officiating methods and scoring system of the games.**(K-4)**

CO5: Explain the duties of officials and official signals of the games.**(K-5)**

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
CO1	3	3				3	3	3		3				18
CO2	3	3	3			3	3	3	2	3	3	3	2	31
CO3	3	3	2	3		3	3	3		2		1	1	23
CO4	3	3	1		2	3	3	3	3	3	2	2	2	30
CO5	3	3	2		3	3	3	3	1	3	3	3	2	32
Grand Total of COs with PSOs and POs														134
Mean Value of COs with PSO and POs = 114/51														2.23

 Strong–3, Medium–2, Low–1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Meanvalue of COs With PSOs and POs			**2.23**
Observation	**COs of Theories of Games –III strongly related with PSOs and POs**		

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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)

Title (Allied- III)	Track and Combined Events	Course Code	22UPEA33
Class	**II B.Sc.(Physical Education)**	Hours	**45**
Semester	**III**	Credit	**03**
Course Educational Objectives(CEO)	• To disseminate the track and combined events • To understand the Marking procedures of Track events • To know the techniques of start and finish in track events • To develop the coordination skills to participate Relay events. • To distinguish the combined events		

Unit	Content	No. of Hours
I	History of Track Events–Rules and their Interpretations– Warm up– General and Specific Conditioning – Maintenance of Track –Need for Standard Track	9
II	Construction–Standard and Non-Standard Track–Calculations RDR–CDR-Diagonal Excess–Staggers	9
III	Starts & Finish: Fixing the block - Types of starts – Crouch starts – Medium Start, Bullet Start, and Elongated Start –Standing starts– Types of Finish–Photo Finish–Shoulder Shrug–Run Through– Torso Finish.	9
IV	Relay Races: Relay Marking - Standard and Non-Standard Track – 4X100 mts –4X400 mts –Batton Exchange –Visual method, Non-Visual method-Style-Upsweep and Downsweep–Specific Drills.	9
V	Hurdles–Marking-110mts, 100mts, 400mts, Heptathlon and Decathlon–List of Events–Order of Events.	9
Books for Study	1.Uppal.A.K., **"A to Z Athletics",** Friends Publication, 2013.	
Books for Reference	1. Peter Matthew, **Historical Dictionary of Track and Field**, The Scarecrow Press, Inc.2012. 2. Website:www.worldathletics.org 3. Website:www.HumanKinetics.com	

Teaching and learning methods

- Class Lecture, Video Clippings, Diagrams, Demonstration, Interact, ICT (Information Communication Technology)

Course Outcome(CO)

On Successful completion of the course, the student able to

CO1: Recall the history of track events **(K-1)**

CO2: Draw the standard and Non-standard Track. **(K-2)**

CO3: Exhibit and explain the skills of start and finish in track events. **(K-2)**

CO4: Outline the relay marking and explain the techniques of relay baton changes. **(K-2)**

CO 5: Explain the order of events in combined events. **(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
CO1	3	3				3	3	3		3				18
CO2	3	3	3			3	3	3	2	3	3	3	2	31
CO3	3	3	2	3		3	3	3		2		1	1	24
CO4	3	3	1		2	3	3	3	3	3	2	2	2	30
CO5	3	3	2		3	3	3	3	1	3	3	3	2	32
Grand Total of COs with PSOs and POs														135
Mean Value of COs with PSO and POs = 135/51														2.64

 Strong–3, Medium–2, Low–1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Mean value of COs with PSOs and Pos			**2.64**
Observation	**COs of Track and Combined Events strongly related with PSOs and POs**		

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)

Title(Allied–3)	Practical: Track & Combined Events	Course Code	
Class	**II B.Sc (Physical Education)**	Hours	**30**
Semester	**III**	Credit	**02**
Course Educational Objectives(CEO)	• To Recall the rules and regulations of combined and Track Events • To Aware the skills of starting and Finishing • To Understand Officiating Methods • To Know the marking rules of Track and Combined Events • To Coach the fundamental Skill of Track and Combined Events		
Content			
1. Test of Fundamental and Advanced Techniques of track events. 2. Rules and Interpretation of track and combined events. 3. Mechanism of officiating –Method of Officiating-Duties of officials. 4. Marking of Track and combined events. 5. Coaching Aspects-Fundamentals skills-Advanced skills-Lead up Activities.			
Books for Study	1. Getting Started in Track and Field Athletics: Advice &ideas for children, parents, and teachers by Gary Barber(Jan 17, 2006) 2. USA Track and Field 2002-03 Directory and Resource Guide (USA Track and Field Directory and Resource Guide, 20022003)by Sherry Quack (Jun2002). 3. Rigbyon Deck Reading Libraries: Leveled Reader Track by Jack Otten (Jul 2001). 4. Athletics 2011: The International Track and Field Annual. Edited by Peter Matthews by Peter Matthews (May 2011). 5. website:www.worldathletics.org		

Course Outcome (CO)

CO 1: List the track and combined events **(K-1)**

CO 2: Prepare and marking the tracks.**(K-3)**

CO 3: Take part in the track events.**(K-4)**

CO 4: Demonstrate the skill of the track events. **(K-2)**

CO 5: Categorize the combined events.**(K-4)**

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
CO1	3		1		3	3	3	3		3				19
CO2	3	3	3		1	3	3	3	2	3	1		2	27
CO3	3	3	2	3	2	3	3	3		2	1		1	26
CO4	3	3	1	3	2	3	3	3	3	3	2		2	31
CO5	3	3	2	2	1	3	3	3	1	3	3		2	29
Grand Total of COs with PSOs and POs														132
Mean Value of COs with PSO and POs =1 32/53														2.49

Strong–3, Medium–2, Low–1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Meanvalue of COs With PSOs and POs			**2.49**
Observation	**COs of Practical: Track & Combined Events strongly related with PSOs and POs**		

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)

Title(Core–4)	Theories of Games-IV (Hockey & Handball)	Course Code	22UPEC44
Class	II B.Sc (Physical Education)	Hours	**75**
Semester	IV	Credit	**05**

Course Educational Objectives(CEO)	• To familiarize the history, their development, organizations and tournaments of Hockey and Handball. • To aware the skills of Hockey and Handball. • To comprehend the relationship between fitness components and performance variables. • To know the marking and rules of Hockey and Handball. • To realize the concepts in officiating Hockey and Handball tournaments.

Unit	Content	No. of Hours
I	**Hockey:** History and Development –Major Competition - Tournaments - General and Specific Training – Warming up & Warming Down – Essential Fitness components.	15
II	**Hockey:** Ground Marking: - Measurements – Equipment's - Fundamental skills - Advanced skills - Rules and Interpretation.	15
III	**Handball**: History and Development – Federations – Important major competition and tournaments Awards - General and Specific Training – Warming up & Warming Down – Essential Fitness components	15
IV	**Handball**: Ground marking - Measurements – Equipment's - Fundamental skills - Advanced skills - Rules and Interpretation.	15
V	Mechanism of Officiating: Methods of Officiating – Duties of Officials – Officials signals - Scoring system – Reasoned development in Hockey & Handball.	15
Books for Study	1. BobSwope., 2011,*"Youth Filed Hockey Drills, Strategies, Plays & Games Handbook"*, St.Louis. 2. Maurice W.Deshong 2011*, "Handball and How to PlayIt,* North America.	

Books for Reference	1. Elizabeth Andrers with SueMyers, 2008 *"Field Hockey steps to Success"* 2ndEd.USA
	2. Grasset & Dunlap. 2004, *"Enjoying Racquet Sports"* U.S.A.
	3. Siobhaa Gibncy and Eugene J.Gibncy, 2011, *"Handball"* South Africa.
	4. http://www.fih.ch
	5. http://www.ihf.info

Teaching and learning methods

- Class Lecture, Video Clippings, Diagrams, Demonstration, ICT (Information communication Technology)

Course Outcome (CO)

CO1: Recall the history, organizations and tournaments of Hockey.**(K-1)**
CO 2: Demonstrate the skills, techniques and tactics of Hockey **(K-2)**
CO3: Remember the history, organizations and tournaments of Handball.**(K-1)**
CO 4: Outline the markings and interpret the rules and regulations of Handball. **(K-3)**
CO 5: Analyze the method of officiating and scoring system.**(K-5)**

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
CO1	3	3				3	3	3		3				18
CO2	3	3	3			3	3	3	2	3	3	3	2	31
CO3	3	3	2	3		3	3	3		2		1	1	23
CO4	3	3	1		2	3	3	3	3	3	2	2	2	30
CO5	3	3	2		3	3	3	3	1	3	3	3	2	32
Grand Total of COs with PSOs and POs														134
Mean Value of COs with PSO and POs = 114/51														2.23

Strong–3, Medium–2, Low–1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Meanvalue of COs With PSOs and POs			**2.23**
Observation	**COs of Theories of Game –IV strongly related with PSOs and POs**		

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)

Title(Core–5)	Practical:Game– IV (Hockey and Handball)	Course Code	22UPEP44
Class	**II B.Sc(Physical Education)**	Hours	**30**
Semester	**IV**	Credit	**02**
Course Educational Objectives(CEO)	- Recall the rules and regulations of Hockey and Handball - Aware the skills of Hockey and Handball. - Understand the relationship between fitness components and performance variables. - Know the marking rules of Hockey and Handball. - To realize the concepts in officiating Hockey and Handball tournaments.		
Content			
1. Demonstrate the Fundamental and Advanced skills of the games 2. Skill tests, scoring and arrangement of the skill tests. 3. Rules of the games with their interpretations. 4. Mechanism of officiating - Duties of officials - Officials signals - Scoring system. 5. Coaching- Fundamental and Advanced skills – Lead Up Activities.			
Books for Reference	1. Bob Swope., 2011, *"Youth Filed Hockey Drills, Strategies, Plays & Games Handbook"*, St.Louis. 2. Maurice W.Deshong2011*,"Handball and How to Play It,* North America. 3. Elizabeth Andrers with Sue Myers, 2008 *"Field Hockey steps to Success"* 2ndEd.USA 4. Grasset & Dunlap.2004,*"Enjoying Racquet Sports"* U.S.A. 5. Siobhaa Gibncy and Eugene J.Gibncy,2011, *"Handball"* South Africa. 6. http://www.fih.ch 7. http://www.ihf.info		

Course Outcome (CO)

On successful completion of the course, the student able to

CO 1: Demonstrate the fundamental and advanced skill of the games. **(K-2)**

CO2: Interpret the rules and regulations of Handball and Hockey.**(K-2)**

CO3: Organize the matches and tournaments of Handball and Hockey.**(K-3)**

CO 4: Analyze the officiating methods and scoring system of the games. **(K-4)**

CO5: Explain the duties of officials and official signals of the games.**(K-5)**

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
CO1	3	3				3	3	3		3				18
CO2	3	3	3			3	3	3	2	3	3	3	2	31
CO3	3	3	2	3		3	3	3		2		1	1	23
CO4	3	3	1		2	3	3	3	3	3	2	2	2	30
CO5	3	3	2		3	3	3	3	1	3	3	3	2	32
Grand Total of COs with PSOs and POs														134
Mean Value of COs with PSO and POs = 114/51														2.23

 Strong–3, Medium–2, Low–1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Meanvalue of Cos With PSOs and Pos			**2.23**
Observation	**COs of Practical: Game–IV strongly related with PSOs and POs**		

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)

Title(Allied–4)	Field Events	Course Code	22UPEA44
Class	**II B.Sc (Physical Education)**	Hours	**45**
Semester	**IV**	Credit	**02**
Course Educational Objectives(CEO)	- To disseminate the Field events - To know the Marking procedures of Field events - To identify the techniques of Field events - To develop the coordination skills to participate Field events - To understand the rules of throw events		

Unit	Content	No. of Hours
I	History of Field Events – Rules and their Interpretations – Warm up – General and specific. Layout, Measurements and marking of the Field Events, (Long Jump, High Jump, Shot Put, Discus ,Javelin,Triple Jump,Pole-vault, Hammer).	9
II	**Long Jump:** Approach-Takeoff–Flight–Landing. **High Jump:** Approach Run–Take off–Bar clearance–Landing Skill–Specific Exercises.	9
III	**Shot Put:**Initialstance–Holding the shot–Grip and Placement of the shot –Techniques: Obrien and Glide–Throwing stance - Throw –Follow through–specific exercises. **Discus Throw:**Initialstance–Holding the Discus-Preliminary swing–Turn–Throwingstance–throw–follow through–specific exercises.	9
IV	**Javelin throw:** Technique: V – Grip, Index grip–Carry–Approach Run–Stride Rhythm–Throwing stances–Throw-Follow through–Specific Exercise. **TripleJump:**Approach Run–Take off–Hop–Step and Jump–Landing–Specific Exercise.	9
V	**Pole Vault:** Grip–Carry–Approach Run–Planting the Pole – Take off – Bar clearance– Landing –Specific Exercise. **Hammer throw:**Initialstance-Grip–Preliminary Swings–turn-Release & Follow through-Specific Exercise.	9

Books forStudy	1. Getting Started in Track and Field Athletics: Advice & ideas for children, parents, and teachers by Gary Barber (Jan17, 2006). 2. Athletics 2011:The International Track and Field Annual. Edited by Peter Matthews by Peter Matthews (May 2011).
Books for Reference	1. USA Track and Field 2002-03 Directory and Resource Guide (USA Track and Field Directory and Resource Guide, 2002 2003) by Sherry Quack (Jun 2002). 2. website:www.worldathletics.org

Teaching and learning methods

- Class Lecture, Video Clippings, Diagrams, Demonstration, ICT (Information communication Technology)

Course Outcome (CO)
On successful completion of the course, the student able to

CO1: Recall the history of field events **(K-1)**
CO2: Summarize the skills of long jump and high jump.**(K-2)**
CO 3: Explain the skills and techniques of shot put and discus throw. **(K-2)**
CO 4: Outline the javelin throw and Triple Jump sectors.**(K-2)**
CO 5: Interpret the rules of pole-vault and Hammer throw.**(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
CO1	3		1			3	3	3		3				16
CO2	3	3	3		1	3	3	3	2	3	1		2	27
CO3	3	3	2	3	2	3	3	3		2	1		1	26
CO4	3	3	1	3	2	3	3	3	3	3	2		2	31
CO5	3	3	2	2	1	3	3	3	1	3	3		2	29
Grand Total of COs with PSOs and POs														129
Mean Value of COs with PSO and POs =129/52														2.48

 Strong–3,Medium–2,Low–1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Meanvalue of COs With PSOs and POs			2.48
Observation	**COs of Field Events strongly related with PSOs and POs**		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514

DEPARTMENTOFPHYSICAL EDUCATION

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

Title	**Practical: Field Events**	Course Code	
Class	**II B.Sc (Physical Education)**	Hours	**30**
Semester	**IV**	Credit	**02**
Course Educational Objectives(CEO)	• To disseminate the Field events • To know the Marking procedures of Field events • To identify the techniques of Field events • To develop the coordination skills to participate Field events • To understand the rules of throw events		
Content			
1. Test of Fundamental and Advanced Techniques of field events. 2. Rules and Interpretation of field events. 3. Mechanism of officiating –Method of Officiating-Duties of officials. 4. Marking of field events. 5. Coaching-Fundamentals skills-Advanced skills-Lead up Activities.			
Books for Study	1. Getting Started in Track and Field Athletics: Advice & ideas for children, parents, and teachers by Gary Barber (Jan 17,2006) 2. USA Track and Field 2002-03 Directory and Resource Guide (USA Track and Field Directory and Resource Guide, 2002-2003)by Sherry Quack (Jun2002). 3. Rigbyon Deck Reading Libraries: Leveled Reader Track by Jack Otten (Jul2001). 4. Athletics 2011:The International Track and Field Annual. Edited by Peter Matthews by Peter Matthews (May 2011). 5. website:www.worldathletics.org		

Course Outcome (CO)

On successful completion of the course, the student able to

CO1: Demonstrate the techniques of field Events.**(K-1)**

CO 2: Apply the techniques in athletic competitions. **(K-3)**

CO 3: Relate the field events.**(K-4)**

CO4: Mark the sectors of all field events.**(K-4)**

CO5: Take part in the competition as an official.**(K-4)**

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
CO1	3		1		3	3	3	3		3				19
CO2	3	3	3		1	3	3	3	2	3	1		2	27
CO3	3	3	2	3	2	3	3	3		2	1		1	26
CO4	3	3	1	3	2	3	3	3	3	3	2		2	31
CO5	3	3	2	2	1	3	3	3	1	3	3		2	29
Grand Total of COs with PSOs and POs														132
Mean Value of COs with PSO and POs = 132/53														2.49

Strong–3, Medium–2, Low–1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Meanvalue of COs with PSOs and POs			**2.49**
Observation	**COs of Practical: Field Events strongly related with PSOs and POs**		

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)

Title (Non Major Elective-I)	Fitness and Wellness	Course Code	22UPEN13
Class	To other major	Hours	45
SEMESTER	III	Credit	02
Course Educational Objectives(CEO)	• To know the basics of Physical fitness and its components • To overcome fitness barriers and involve in physical activity • To understand the basic method of conditioning • Know the procedure to assess the fitness • To acquire knowledge about the wellness		

Unit	Content	No. of Hours
I	Fitness: Meaning - Physical Fitness and Mental fitness - General and Specific fitness - Need and importance of Physical fitness – Types of Physical Fitness	9
II	Health related Physical Fitness Components: Cardio Respiratory Endurance, Muscular Strength& Endurance, Flexibility, and Body Composition – means and methods for developi	9
III	Performance related Physical Fitness Components: Speed, Strength, Endurance, Agility, Power and Flexibility.	9
IV	Assessment of Physical Fitness: Cardio Respiratory Endurance, Muscular Strength, Muscular Endurance, Flexibility	9
V	Wellness: Meaning – Aging process–Factors influencing wellness - Healthy aging.	9
Books for Study	1. Hoeger, Werner, W.K., & Hoeger, Sharon, A. (1990). 2. Fitness and Wellness. Englewood: Morton publishing Company. 3. Hazedine, (1985). Fitness for Sports. Ramsburg: The CrowoodRess Ltd.	
Books for Reference	4. James & Hart, L., (1983). 100% Fitness, New Delhi: Goodwill Publishing House. 5. Anspaugh, D.J., Hamrick, M.H., & Rosato, F.D. (1991). Wellness: Concepts and applications. New York: Mc Graw - Hill. 6. Arumugam, S., &Sivagnanam, P. (2019). Fitness and Wellness. Madurai: Shanlax Publications.	

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)

Title (Non Major Elective-II)	Fundamentals of yoga	Course Code	22UPEN24
Class	**II (B.Sc Physical Education)**	Hours	**45**
Semester	**IV**	Credit	**02**
Course Educational Objectives(CEO)	• To understand the concept of Yoga • To list the sitting and Standing Asana • To state the importance of Vajrasana • To aware the benefits of Head Posture • To know the techniques of Prone Posture		

Unit	Content	No.of Hours
I	History of Yoga–Meaning of Yoga–Aim and Objectives of Yoga–System of Yoga– Eight Limbs of yoga-Importance of Yoga	9
II	Asanas: Meaning- Guidelines for practicing asanas. Long Sitting Positions-Procedures–Padmasana–Vajrasana	9
III	Standing position–Procedures–Trikonasana-Vrikshasana. Kneeling Position–Procedures–Sirasasana-Mayurasana	9
IV	Prone Position –Procedure–Dhanurasana–Bhujangasana. Supine Position–Procedure-Halasana-Sarvangasana.	9
V	Effects of Yogic Pranayama- Puraka– Kumbhaka– Rechaka –Importance of Pranayama–Naudi Sudi–Sitali–Sitakari.	9
Books for Study	1.Chandrasekaran K, "**Sound Health Through Yoga**",Premkalyan Publication, Sedapatti, 2010.	
Books for Reference	1. B.K.S.Iyengar. **"Light On Life"**, Yellow Kite, an imprint of Hodder & Stoughton, 2016. 2. Dr.P.Taraknath,**"Yoga Education"**, Sports Publication, 2016. 3. Dr.Nathial, M.S., **"Yoga Education"** Friends Publication, 2015.	

Teaching and learning methods

• Class Lecture, Video Clippings, Demonstration, ICT (Information communication Technology)

Course Outcome (CO)

On successful completion of the course, the student able to

CO1: Explain the concepts of yoga. **(K-2)**

CO2: Summarize the asanas and its use. **(K-2)**

CO 3: Describe the benefits of asanas in Kneeling and standing position. **(K-2)**

CO4: Write the procedure of asana in supine and prone position.**(K-1)**

CO 5: Analyze the effects of yoga and pranayama practices. **(K-4)**

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
CO1	2	3		1		3	3			3	1			16
CO2	2	3		3	2	3	3	2		3	2			23
CO3	2	3		3	2	3	3	2		3	2			23
CO4	2	3		2		3	3	1		3	1			18
CO5	2	3		2		3	3	1		3	1			18
Grand Total of COs with PSOs and POs														98
Mean Value of COs with PSO and POs = 98/41														2.39

 Strong–3, Medium–2, Low–1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Meanvalue of COs With PSOs and POs			**2.39**
Observation	**COs of Fundamentals of yoga strongly related with PSOs and POs**		

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)

Title :Self Learning	Modern Trends in Physical Education	Course Code	22UPESL3
Semester	**III**	Credit	**03**
Course Educational Objectives(CEO)	- To adequate the knowledge in physical education programme in India - To explain about the career option in physical education. - To discuss about the modern sports facilities. - To know the modern trends in sports infrastructure. - To develop the individual talent identification in sports.		
Unit			
I	Physical Education Teacher Training programme in India:B.Sc., B.P.Ed.,M.P.Ed., Research programme: M.Phil., Ph.D.		
II	School: Physical Education Teacher, Physical Director, RIPE, CIPE. College & University: Asst. Director of Physical Education, Deputy Director of Physical Education, Director of Physical Education, Assistant Professor, Associate Professor, Professor, Principal – Sports Council: Coaches, DSO, RSM, DGM and GM.		
III	Play area-synthetic track-Turf field-Toroflexsurface-Grassfield–Woodensurface-Indoorstadium-Structureand facilities-Flood lit matches.		
IV	Assistance for building infrastructure - playfields, Gymnasium, Swimming pool, Stadium and Equipments-Assistance for coaching and training programme-Ruralandurban-different levels-advance training and coaching-Assistance for competitions-District, State, National, International-Incentives.		
V	Talent Identification in sports and games-The compulsory Physical Education programme in Schools and Colleges.		

Book for Reference

1. Bunn, JohnW. (1955). Scientific Principles of Coaching. New York: Prentice Hall Inc.
2. Charles, Bucher A., (1972). Foundations of Physical Education. Saint Louis: The C.V.Kosby Company.
3. Hey, James, G., (1973). The Biomechanics of Sports Techniques, Prentice Hall Inc. Englewood Cliffs N.S.
4. Singh, Ajmer., et.al. (2005). Essential of Physical Education. New Delhi: Kayani Publication.

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR–625514
DEPARTMENT O FPHYSICAL EDUCATION
(Outcome based syllabus under CBCS Structure for the students admitted from the academic year 2022 -2023)

Title :Self Learning	Health Education	Course Code	22UPESL4
Semester	IV	Credit	**03**
Course Educational Objectives(CEO)	• To know the health and Diet • To distinguish mental health and physical health • To understand the various kinds of pollution • To aware the principles of safety education • To Know the techniques of First Aid		

Unit	Content
I	Meaning and Definition of Health Education-Objectives - Principles – Factors Influencing Health- Scope of Health education-Health Organizations.
II	Nutrition: Diet - Components of Diet– Balanced Diet - Daily Energy Requirements – Nutrient Balance – Mal Nutrition.
III	Meaning of Mental Health–Fundamental factors for Mental Health–Hygiene–Personal – Importance of personal hygiene.
IV	Pollution: Meaning – Types of Pollution: Air, Water, Soil and Noise. Causes and effects of pollution.
V	Diseases: Communicable: Malaria, Typhoid, Cholera, Chickenpox, Tuberculosis–Non–Communicable - Cardiovascular Diseases – Diabetes - Asthma – Hypertension – Cancer.
Books for Study	1. Dr. Sathishmalik, **"Health education and Environmental Studies",** Sports Publications,New Delhi, 2016.
Books for Reference	

Teaching and learning methods
• Class Lecture, Group discussion, Assignment, Seminars.

Course Outcome (CO)
On successful completion of the course, the student able to
CO1: Describe about the health education and its organization.**(K-2)**
CO2: Summarize the mental health and school health programme.**(K-2)**
CO 3: Find the solution for the communicable diseases and life style disorder.**(K-4)**
CO4: Apply the principles of safety education in schools and playground.**(K-4)**
CO 5: Make use of first aid in emergency.**(K-4)**

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
CO1	3	2				3	3	2		3			3	19
CO2	3					3	3			3			3	15
CO3	3					3	3	3	3	2			3	20
CO4	3					3	3	2	2	2			2	17
CO5	3	3				3	3	2	3	3			3	23
Grand Total of COs with PSOs and POs														94
Mean Value of COs with PSO and POs = 96/34														2.76

Strong–3, Medium–2, Low–1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.0 to 3.0
Quality	Low	Medium	Strong
Meanvalue of COs With PSOs and POs			**2.76**
Observation	**COs of Health Education strongly related with PSOs and POs**		

TRAINING METHODS IN PHYSICALEDUCATION

UNIT-I CONDITIONING EXERCISES

General conditioning exercises- specific conditioning exercises-coreexercises-circuittraining.

UNIT-II ENDURANCE TRAINING

Slow continuous run- fast continuous run-varied pace run- fartlek training –interval training.

UNIT-III STRENGTH TRAINING

Physical exercise with own body weight-physical exercise with external resistance devices-weight training –medicine ball exercises-dumbbell exercises.

UNIT-IV SPEED TRAINING

Reaction ability training-acceleration ability training-loco motorability training-speed endurance training.

UNIT– V FLEXIBILITY TRAINING

Active flexibility exercises-passive flexibility exercises –PNF Stretching.

List of Practical Testitems
1. 1600m run
2. 50m run
3. Push-ups
4. Standing broad jump
5. Sargent Jump
6. Sit-ups
7. Shuttle run test
8. Sit and reachtest

REFERENCE BOOKS
1. Choudhari, Sanjay,T., "Essential of Strength Training and conditioning", Khel Sahithya Kendra,New Delhi, 2013.
2. Kawade,R.R.,"Sports Training" Sports Publications, Chennai, 2013.
3. MishraS.C., "Sports Training", Sports Publications.Chennai, 2009.
4. Sebastian.P.J., "System of Sports Training", Friends Publications, Chennai, 2013.

WEBLIOGRAPHY
1. https://www.teachpe.com/training-fitness/types-of-fitness-test
2. https://schoolfitness.kheloindia.gov.in/StaticPage/TestVideos.aspx
3. https://www.exercise.com/learn/health-and-fitness-assessments-guide/

DEPARTMENT OF COMPUTER SCIENCE

ARUL ANANDAR COLLEGE (AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
CBCS and OBE PATTERN
(Those who join from 2022-2023 onwards)

Part	Subject Code	Title of the paper	Hours	Credits
SEMESTER – I				
I	22UTAL11/ 22UHNL11/ 22USNL11	Tamil/Hindi/French	06	04
II	22UENB11	English through Prose & Short Story– Stream -B	05	04
III	22UCSC11	**Core:1ProgramminginC**	05	04
	22UCSC21	**Core:2PCHardwareandTroubleshooting**	04	03
	22UCSP11	**CoreLab:1ProgramminginC–Practical**	05	03
	22UCSA11	**Allied:1DigitalComputerFundamentals**	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	---	---
		Total	**30**	**23**
SEMESTER–II				
I	22UTAL22/ 22UHNL22/ 22USNL22	Tamil/Hindi/French	06	04
II	22UENB22	English through Prose & Poetry-Stream B	05	04·
III	22UCSC32	**Core:3ObjectOrientedProgrammingwithC++**	05	04
	22UCSC42	**Core:4Web Designing**	04	03
	22UCSP22	**CoreLab:2ObjectOrientedProgrammingwith C++-Practical**	05	03
	22UCSA22	**Allied:2DiscreteMathematics**	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
		Total	**30**	**24**

		SEMESTER– III		
	22UCSC53	**Core:5Programming in JAVA**	05	04
	22UCSC63	**Core:6 Data Structures and Algorithms**	05	04
III	22UCSC73	**Core:7 Operating System**	04	03
	22UCSP33	**CoreLab:3Programming in JAVA–Lab**	05	03
	22UCSA33	**Allied:3 Computer Organization and Architecture**	04	03
	22UCSN13	**NME:1Web Designing (For Arts students)**	03	02
IV	22UCSS13	**SBE:1Quantitative Aptitude and Reasoning**	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		
		Total	**30**	**22**
		SEMESTER – IV		
	22UCSC84	**Core:8 WebProgramming**	05	04
	22UCSC94	**Core:9 Relational Data Base Management System**	05	04
III	22UCSD04	**Core:10 Computer Networks**	05	04
	22UCSP44	**CoreLab:4 Web Programming– Lab**	05	03
	22UCSA44	**Allied:4 Operation Research**	03	03
	22UCSN24	NME:2 Web Designing (For Science Students)	03	02
IV	22UCSS24	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
		Total	**30**	**25**
		SEMESTER – V		
III	22UCSD15	**Core:11Big Data Analytics using R**	05	05
	22UCSD25	**Core:12 Mobile Computing**	05	05
	22UCSD35	**Core:13Dot NET Programming**	05	05
	22UCSD45	**Core:14 Network Security and Cryptography**	05	04
	22UCSP55	Core Lab: 5 Dot NET Programming – Lab	05	03

	22UCSE15	Core Elective:1 1. Introduction to Data Science 2. Artificial Neural Networks 3. Linux Shell Programming	**03**	03
IV	22USSI16	Soft Skills	**02**	-
		Total	**30**	25
SEMESTER– VI				
III	22UCSD56	**Core:15 Software Engineering**	05	04
	22UCSD66	**Core:16 Data Mining and Ware Housing**	04	04
	22UCSD76	**Core:17 Mobile Application Development**	05	04
	22UCSD86	**Core:18 Python Programming**	05	03
	22UCSD86	**Core:19 Major Project**	01	02
	22UCSP66	**Core Lab: Python Programming –Lab**	05	03
	22UCSE26	**Core Elective: 2** **1. Internet of Things (IoT)** **2.Artificial Intelligence** **3.SoftwareTesting**	03	03
IV	22USSI16	Soft Skills	02	02
		Total	**30**	**25**

Credits for each Semester

Semester	I	II	III	IV	V	VI	Total
Credits	23	24	22	25	25	25	**144**

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
PROGRAMMING INJAVA

Class   :B.Sc.(Comp. Science)   **Part III : Core -5**
Semester : III   **Hours : 90**
Subject Code: **Credits: 5**

Objectives:
   The course enables the students to
   * UnderstandProgrammingstructure,Objectorientedconcepts,JVMandDatatypes
   * Apply the fundamentals of programming such as conditional and iterative execution, classes & methods.
   * Apply the unique features of java such as interfaces, multithreaded programming & packages.
   * Design User Interface Components.
   * Develop database and file management concepts

UNITI   **18 Hours**
Fundamentals of objects-oriented programming: Basic concepts of object oriented programming. **Overview of java:** simple java program - structure - java tokens-statements - javavirtualmachine-Constants–Variables-DataTypes–Operator–Expressions.

UNIT II   **18 Hours**
Decision Making and Branching-Decision Making and Looping classes, objects and methods:Defining class-creating object-accessing class members–constructors-method overloading - static members - Nesting of methods – Inheritance - Overriding methods – **Arrays -String-Vectors**.

UNIT III   **18 Hours**
Interfaces: Multiple Inheritances **-** Defining Interface - Extending Interface –Implementing Interface - Accessing Interface variables - P**ackages:** Java API Packages - user defined packages –**Multithreaded programming:**Introduction-Creating threads -Extending the thread class-Lifecycle of a thread –thread exceptions-thread priority -synchronization.

UNITIV   **18 Hours**
Managing Errors and Exceptions: Types of Errors – Exceptions - syntax of Exception Handling. Swing - The MVC Architecture and Swing, Layout Manager and Layouts, The JComponent class, Components – JButton, JLabel, JText, JText Area, JCheck Box and JRadio Button, JList, JCombo Box, JMenu and JPopup Menu Class, JMenuItem and JCheck Box MenuItem, JRadio Button MenuItem ,JScroll Bar, Dialogs (Message, confirmation, input), JFile Chooser, JColor Chooser, Event Handling: Event sources, Listeners, Mouse and Keyboard Event Handling, Adapters

UNITV   **18 Hours**
ManagingInput/outputFilesinJava:Conceptofstreams-Streamclasses-bytestreamClasses-characterstreamclasses-Exception-creationoffiles-reading/writingcharacter –Introduction to JDBC, Essential JDBC classes, Connecting to database, Inserting data in database, Retrieving data from database, deleting data in database, updating data in database, store image in the

database, to retrieve image from database, to store file in database, retrieve file from database

Book for Study

1. Balagurusamy.E, Programming with Java-A Primer, Sixth Edition, 2019, TMH.

Books for Reference

1. NaughtonPatrick,SchildtHebert,*TheCompleteReferenceJava2*,NinthEdition, 2014,TMH.

2. Hubbard R.John, *Programming with Java*, Second Edition, 2006, TMH.

Web References

1. **https://onlinecourses.nptel.ac.in/noc22_cs47/preview**

2. **https://www.geeksforgeeks.org/java/**

3. **https://docs.oracle.com/javaee/7/index.html**

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 to solve standalone applications (K2)

CO2: Apply Java control statements and methods for complex Programs (K3)

CO3: Design and develop applications using unique features (K6)

CO4: Ability to develop graphics applications (K6)

CO5 : Demonstrate JAVA using window components and JDBC. (K3)

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
CO1	3	3	-	-	2	1	1	-	1	1	2	1	1	16
CO2	3	2	-	-	2	2	1	-	2	2	2	1	1	18
CO3	3	3	-	-	2	3	1	-	3	3	2	2	2	24
CO4	3	3	-	-	2	2	1	-	3	2	2	2	1	21
CO5	3	3	-	-	2	2	1	-	3	3	3	2	2	24
Grand total of COs with PSOs and POs														103
Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs/ Number of COs relating with PSOs and POs=(103/50)														2.06

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			2.06
Observation	COs of Programming in Java–Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
DATA STRUCTURES AND ALGORITHMS

Class	: B.Sc. (Comp. Science)	**Part III**	: Core-6
Semester	: III	**Hours**	: 90
Subject Code :		**Credit**	: 5

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   **18 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   **18 Hours**
Stacks and Queues: Fundamentals-Stack- usage of Stack- Stack ADT- Applications-Queue- usage of Queue - Queue ADT-Operations-Applications.

UNIT III   **18 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   **18 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   **18 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 Strucures 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++*, 4th edition, 2013, Person Publications.
  2. Horowitz Ellitz, Sahni Sartaj, *Data Structures*, Second Edition, 2012,Universities Press.

Web Reference:
  1. https://nptel.ac.in/courses/106106130
  2. https://w3.cs.jmu.edu/spragunr/CS240_F12/ConciseNotes.pdf

3. https://www.tutorialspoint.com/data_structures_algorithms/dsa_quick_guide.htm
4. https://www.geektonight.com/data-structures-and-algorithms-notes/
5. 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
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
Grand total of COs with PSOs and POs														84
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)														1.68

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		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 : B. Sc. (Comp. Sci.)	Part III : Core 7
Semester : III	Hours : 60
Subject Code:	Credits : 04

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 issues 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, Gerg 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
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	3	2	-	-	1	1	1	-	1	1	2	1	1	14
CO2	3	3	-	-	1	1	1	-	2	1	2	1	1	16
CO3	3	3	-	-	1	1	1	-	2	1	1	1	1	15
CO4	3	2	-	-	2	1	1	-	1	1	1	1	1	14
CO5	3	2	-	-	2	2	1	-	1	1	1	1	1	15
Grand total of COs with PSOs and POs														74
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(74/50)														1.48

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		1.48	
Observation	COs of Operating System – Medium related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICAITONS
PROGRAMMING IN JAVA-LAB

Class   : B. Sc. (Computer Science)   **Part   : Core Lab- 3**
Semester : III   **Hours : 75**
Subject Code :   **Credits : 03**
Objectives:
The course enables the students to
- Understand basics of JAVA programs and its execution.
- Develop applications on Arrays, Strings & Vectors & Patterns.
- Develop programs on Object Oriented Programming
- Design User Interface Elements
- Develop applications on JDBC.

List of Exercises
JAVA Programs on Decision Making/Looping
1. Calculating Batting Average.
2. Calculate average Marks
3. Factorial program in Java
4. Sum of N Numbers
5. Sum of Digits
6. Reverse String
7. HCF & LCM of Two Numbers
8. Food order & billing using Switch .
9. Prime Number Generation
10. Armstrong Number Generation
JAVA Programs on Arrays
11. Matrix Addition/Subtraction
12. Matrix Multiplication
13. Transpose of Matrix
14. Linear Search/Binary Search
15. Reverse a Number.
JAVA Programs on Patterns
16. Print Pyramid Star Pattern
17. Print Diamond star Pattern
18. Print Square Star Pattern
19. Hallow Inverted Right Triangle Star Pattern
JAVA Programs on Classes & Object
20. To implement stack and queue concept.
21. Dynamic polymorphism and interfaces.
22. Multithreaded producer and consumer application.
23. Customized exception and also make use of all the 5 exception keywords.
24. Program to implement Inheritance.
JAVA Programs on User Interface Elements

24. Develop a scientific calculator using swings.
25. Create a simple editor using swing.

Working on Database
26. Create Database and Tables, DDL, DML commands.
27. Working on Aggregate functions & Wild Cards.
28. Working on joins.
29. Working on Nested Queries.
30. JAVA Programs on Java Database Connectivity
31. Develop Java application to implement Insert, Update, Delete, and Search Options.

Outcomes:

On successful completion of the course the students able to

CO1: Apply Java compiler and eclipse platform to write and execute java program(K3)

CO2: Understand and Apply Object oriented features and Java concepts(K3)

CO3: Apply the concept of multithreading and implement exception handling (K3)

CO4: Access data from a Database with java program.(K3)

CO5: Develop applications using ConsoleI/O and File I/O, GUI applications (k6)

K1=Remember   **K2**=Understand   **K3**=Apply   **K4**=Analysis   **K5**=Evaluate   **K6**=Create

Mapping

	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	-	-	1	1	1	-	21
	Grand Total of COs wit PSOs and POs													109
	Mean Value of COs with PSOs and POs **=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(109/50)**													2.18

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			2.18
Observation	COs of Programming in JAVA-Lab Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
COMPUTER ORGANIZATION AND ARCHITECTURE

Class   : B.Sc. (Comp. Sci)   Part III : Allied - 3
Semester   : III   Hours   : 60
Subject Code :   Credit   : 03

Objectives:
The course enables the students to
- Gain knowledge of architectural development of computer system components
- Explore functional components of CPU and their roles
- Get exposure on computer instruction formats and types
- Classify memory components with respect to their storage capacity and speed
- Explore interfacing methods for both input and output devices with CPU

UNIT – I EVOLUTION AND CLASSIFICATION   12 Hours
Mechanical calculating Machines – Vacuum Tube computers – Transistorized Computers – Integrated Circuit Computers – VLSI computers – Computer level hierarchy – The Von-Neumann model – Parallel processors

UNIT – II CPU ARCHITECTURE   12 Hours
CPU Components – Registers – Accumulator Logic Unit – Control Unit – Bus Subsystem – Input and Output subsystem – Interrupts and Interrupt service routines

UNIT – III INSTRUCTION SET ARCHITECTURES   12 Hours
Instruction Processing – Instruction Cycle – Interrupt Cycle - Instruction Formats – Instruction types – Instruction Decoding - Instruction Pipelining – Addressing modes

UNIT – IV MEMORY ARCHITECTURE   12 Hours
Types of memory – Memory hierarchy – RAM – ROM – Cache memory – Associative Memory – Secondary Storages – Virtual memory – Paging – Page replacement algorithms

UNIT – V INPUT AND OUTPUT ARCHITECTURE   12 Hours
I/O and Performance – I/O Control methods – Programmed I/O – Interrupt-driven I/O – Memory mapped I/O – Direct Memory Access – Channel attached I/O – I/O Processor - Character I/O – Block I/O – Bus operation

Book for study
1. Linda Null & Julia Lobur, The Essentials of Computer Organization and Architecture, 2015, Jones and Bartlett Learning.

Books for Reference
1. Aharon Yadin, Computer Systems Architecture, 2016,CRC Press.
2. Stanley Warford, Computer Systems, 2017, Jones and Bartlett Learning.

Web References
1. Computer Architecture and Organization-https://nptel.ac.in/courses/106105163
2. Computer Architecture-https://nptel.ac.in/courses/106102157
3. Introduction to Computer Architecture-https://nptel.ac.in/courses/106102062

Teaching Methods
➢ Lectures with notes

- ➢ Group Discussions
- ➢ Visual aids
- ➢ Assignment and Tutorials

Course Outcomes:

On successful completion of the course students will be able to

CO1: Review the formal evolution of computer system architectures (K1)

CO2: Explore CPU components and their interconnections (K2)

CO3: Analyze instruction formats and decoding mechanism of an instruction (K4)

CO4: Classify memory with respect to its hierarchy of capacity and speed (K3)

CO5: Explore various I/O control methods and their functional characteristics (K5)

K1=Remember **K2**=Understand **K3**=Apply **K4**=Analysis **K5**=Evaluate **K6**=Create

Mapping

	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	3	3	2	3	3	-	-	2	2	2	-	25
Grand Total of COs with POs PSOs														112
Mean Value of COs with PSOs and POs = **Grand total of COs with PSOs and POs /** **Number of COs relating with PSOs and POs=(112/50)**														**2.24**

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 this course is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
WEB DESIGNING

Class : B.Sc.(Comp. Sci.)		**Part III : NME-1**
Semester : III		**Hours : 45**
Subject Code :		**Credit : 02**

Objectives:

The course enables the students to

- Understand and apply the basic HTML tags to create attractive web pages.
- Demonstrate to link web pages; create table and frames within the web page.
- Work with various image files and various transformation of images
- Apply various effects and making color correction with the scanned images.
- Perform simple animation in Flash environment.

UNIT I: HTML **(9 Hours)**

Introduction of HTML - Writing my first HTML Page - Basic tags used in HTML: Heading Tags - Paragraph Tag - Line Break Tag -Centering Content - Horizontal Line – Preserve Formatting - Non Breaking Spaced - Elements In HTML: Elements in HTML – HTML Tag Vs Element - Formatting tags in HTML

UNIT II: **(9 Hours)**

Images and incorporating images , working with Tables , Working with Lists , Working with hyperlinks - Frames and frame management - Forms and Form Management

UNIT III: PHOTOSHOP **(9 Hours)**

Introduction - Getting started with Photoshop – The Photoshop Program Window: Menu bar – The Options bar – Image Window – Ruler – Palletes – The Toolbox - Working with images: Image Size – Image Resolution – Editing Images – Color Modes – Setting the Current Foreground and Background colors – File Formats

UNIT IV: **(9 Hours)**

Painting Tools, Drawing Tools and Retouching Tools – Layers: Layers Palette – Working with Layers – New Layer via Cut and Copy – Hiding and Showing Layers – Flattening Images – Working with Adjustment Layers – Layer Effects - Type Tool: Changing the Type Settings – Type Masking

UNIT V: FLASH **(9 Hours)**

Introduction to Flash – Flash Interface: Stage – Timeline – Library – Drawings and Symbols – Flash Project Properties – Timeline and Frames – Animation: Frame by Frame Animation – Tween Animation

Books for Study

1. C. Xavier, Web Technologoy and Design, 2007, New Age International publishers.
2. Schrand Richard, *Photoshop 6 visual Jumpstart*, 2000, Adobe Press. (Unit I, II&III).
3. Mohles L. James, *Flash 5.0 Graphics, Animation & Interaction*, Macromedia, 2000, World Press. (Unit IV & V).

Books for Reference

1. Deitel, *Internet and World Wide Web How to Program*, Third Edition, 2003, Prentice Hall.
2. Reinhardt Robert, Lentz Warren Jon, *Flash 5 Bible*, 2001, Hungry Minds Inc.
3. Meenakshi G M, *Web Graphics*, 2007, SCITECH Publication.

Web References

1. https://www.geeksforgeeks.org/html-basics
2. https://www.educba.com/adobe-photoshop-tools
3. https://www.photoshopessentials.com/basics
4. www.tutorialboneyard.com/simple-flash-animation/
5. https://www.instructables.com/Flash-Animation-Basics

Teaching Methods

- ➢ Lecturing
- ➢ Group Discussions
- ➢ PPTs
- ➢ Learning by Doing
- ➢ Video tutorials

Course Outcomes:

On Successful completion of the course the students able to

CO1: Understanding the HTML concepts. (K2)

CO2: Apply HTML tags to 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: Understand the concepts of timeline motion to create simple Animation. (K4)

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
CO1	3	3	-	-	1	2	2	-	3	2	2	2	2	22
CO2	3	3	-	-	1	2	2	-	3	2	2	2	2	22
CO3	3	3	-	-	1	3	2	-	3	1	2	2	2	22
CO4	3	3	-	-	1	3	2	-	3	1	2	2	2	22
CO5	3	3	-	-	1	3	1	-	2	1	2	1	1	18
Grand total of COs with PSOs and POs														106
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)														2.12

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 Web Designing – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
QUANTITATIVE APTITUDE AND REASONING

Class	: B.Sc. (Comp. Sci.)	**Part**	: IV SBE - 1
Semester	: III	**Hours**	: 45
Subject Code	:	**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)**

Arithmetic: 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 & Proportion - Problems on Ages - Problems on Trains – Boats and Streams – Alligations or Mixture – Calendar.

Unit IV **(9 Hours)**

Data Interpretation: Tabulation - Pie Charts - Bar Graphs - Line Graphs -Venn Diagrams (Syllogism).

Unit V **(9 Hours)**

Reasoning: Letter and Symbols Series- Coding-Decoding- Seating Arrangement (circle) - Letter – Word Problems-Mathematical Operations (Inequality).

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.

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-gq/
4. DataInterpretation(Charts):https://www.tutorialspoint.com/quantitative_aptitude/aptitude

bar_charts.htm
5. Reasoning : https://www.javatpoint.com/aptitude/problem-on-ages-1

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
CO1	3	3	-	-	1	2	1	-	2	1	1	1	1	16
CO2	3	3	-	-	2	2	1	-	2	1	1	1	1	17
CO3	3	3	-	-	2	2	1	-	1	2	1	2	1	18
CO4	3	3	-	-	2	1	1	-	1	2	1	2	1	17
CO5	3	3	-	-	1	3	1	-	2	2	1	1	1	18
Grand total of COs with PSOs and POs														86
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)														1.72

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		1.72	
Observation	COs of Quantitative Aptitude and Reasoning– Medium related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE& APPLICATIONS
WEB PROGRAMMING

Class	: B. Sc. (Comp. Sci.)	**Part III : Core - 8**	
Semester	: IV	**Hours : 75**	
Subject Code	:	**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   15 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   15 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   15 Hours

Characteristics of Scripting languages - History of Javascript – functions – Variables and Identifiers – Statements and Objects – Document Object Model – Forms – Controls – Accessing form control values – Reset and Focus methods – Comments – Coding conventions – Event handler attributes – Conditional statements – Loop statements – External scripts

UNIT – IV: WEB PAGE DESIGN WITH PHP   15 Hours

Essential terminology – Structure of PHP scripts – Statements – blocks – comments – Datatypes – operators – Conditional execution – Loop Structures – Count controlled loops – Conditional loops – Arrays – Functions – user defined functions – built-in functions – String handling functions – Array related functions – Miscellaneous functions – PHP Graphics – Pie charts – Bar charts – Line graphs

UNIT – V: WEB PORTAL DESIGN   15 Hours

Characteristics of Web portals – Web pages Vs Web portals – MySQL datatypes – creating databases and Table objects – Import and export database contents – Administrative interfaces and credentials – Inserting new records – edit and deletion of existing records – Connecting Database with PHP – mysqli() connector interface – feeding data through forms – report generation from databases

Books for study
1. John Dean, Web Programming with HTML 5.0, CSS and Javascript, Jones and Bartlet Learning, 2019

2. David R. Brooks, Programming in HTML and PHP, Springer 2017
3. Adrian W. West, Steve Prettyman, Practical PHP 7, MYSQL 8, MariaDB website databases, APress 2018

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

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 portals (K5)

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	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 PSOs and POs														110
Mean Value of COs with PSOs and POs **= Grand total of COs with PSOs and POs /** **Number of COs relating with PSOs and POs=(110/50)**														2.2

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 this course is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICAITONS
RELATIONAL DATABASE MANAGEMENT SYSTEM

Class : B. Sc.(Computer Science)		**Part** : III Core- 8
Semester : IV		**Hours** : 75
Subject Code :		**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   **15 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   **15 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   **15 Hours**
         Advance SQL : Integrity and Security: Domain - Constraint - Referential Integrity - assertions – Triggers. **Security and Authorization:** Authorization in SQL - Encryption and Authentication.

UNIT – IV   **15 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   **15 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

2. DBMS with web: https://www.slideshare.net/marccdy1/webdbms-a-quick-reference
3. 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

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
Grand total of COs with PSOs and POs														77
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)														1.54

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		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
COMPUTER NETWORKS

Class	: B. Sc. (Comp. Sci.)	**Part**	: III Core-10
Semester	: IV	**Hours**	: 75
Subject Code:		**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   **15 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   **15 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   **15 Hours**
        DATA LINK LAYER: Error Detection and Correction methods. **ACCESS CONTROL SUB LAYER:** Multiple Access Protocols – Ethernet – Wireless LANs – Bluetooth.

UNIT IV   **15 Hours**
        NETWORK LAYER: Routing Algorithm – Congestion Control Algorithm. **Transport Layer:** Elements of Transport Protocols - Internet Transport Protocols.

UNIT V   **15 Hours**
        APPLICATION LAYER: DNS – E-mail – FTP – TELNET – HTTP.

Book for Study
 1. Andrew S. Tanenbaum and Wetherall J. David, Computer Networks, 5th Edition, 2013, PHI.

Books for Reference:
1. Achyut S Godbole, Data Communications and Networks, 2nd Edition, 2011, TMH.
2. Black Uyless, Computer Networks Protocols, Standard, Interfaces, 2nd Edition, 1993, PHI.

Teaching Methods
- Lecturing
- Group Discussions
- PPTs
- Quiz Programming
- Video Tutorials

Web References

1. https://nptel.ac.in/courses/106106091
2. https://nptel.ac.in/courses/106105183

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
CO1	3	3	-	-	3	2	2	-	3	2	2	1	2	23
CO2	3	2	-	-	2	1	2	-	2	1	1	1	1	16
CO3	3	2	-	-	2	1	2	-	1	1	2	1	1	16
CO4	3	2	-	-	2	2	2	-	2	1	2	1	1	18
CO5	3	2	-	-	1	-	1	-	1	-	-	1	1	10
Grand total of COs with PSOs and POs														83
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)														**1.77**

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
WEB PROGRAMMING LAB

Class   : B. Sc. (Comp. Sci.)   Part III : Core Lab-4
Semester   : IV   Hours : 75
Subject Code: Credits : 03

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

	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
	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)													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 this course is strongly related with PSOs and POs		

ARUL ANANDAR COLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE
OPERATIONS   RESEARCH

Class	: B. Sc. (Comp. Sci.)	**Part**	: III Allied - 4
Semester	: IV	**Hours**	: 45 Hours
Subject Code	:	**Credits**	: 03

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/

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
CO1	2	2	-	-	3	3	3	2	2	3	1	3	-	24
CO2	2	3	-	-	3	3	3	3	2	3	1	3	-	26
CO3	1	2	-	-	2	2	2	1	2	3	1	2	-	18
CO4	2	3	-	-	3	3	3	3	2	3	1	3	-	26
CO5	2	2	-	-	3	2	2	2	2	2	1	2	-	20
Grand total of COs with PSOs and POs														114
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)														2.28

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			2.28
Observation	COs of Operation Research – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
WEB DESIGNING

Class	: B.Sc.(Comp. Sci.)	**Part III**	: NME - 2
Semester	: IV	**Hours**	: 45
Subject Code	:	**Credit**	: 02

Objectives:

The course enables the students to

- Understand and apply the basic HTML tags to create attractive web pages.
- Demonstrate to link web pages, create table and frames within the web page.
- Work with various image files and various transformation of images
- Apply various effects and making color correction with the scanned images.
- Perform simple animation in Flash environment.

UNIT I: HTML   (9 Hours)

Introduction of HTML - Writing my first HTML Page - Basic tags used in HTML: Heading Tags - Paragraph Tag - Line Break Tag -Centering Content - Horizontal Line – Preserve Formatting - Non Breaking Spaced - Elements In HTML: Elements in HTML – HTML Tag Vs Element - Formatting tags in HTML

UNIT II: (9 Hours)

Images and incorporating images , working with Tables , Working with Lists , Working with hyperlinks - Frames and frame management - Forms and Form Management

UNIT III: PHOTOSHOP   (9 Hours)

Introduction - Getting started with Photoshop – The Photoshop Program Window: Menu bar – The Options bar – Image Window – Ruler – Palletes – The Toolbox - Working with images: Image Size – Image Resolution – Editing Images – Color Modes – Setting the Current Foreground and Background colors – File Formats

UNIT IV: (9 Hours)

Painting Tools, Drawing Tools and Retouching Tools – Layers: Layers Palette – Working with Layers – New Layer via Cut and Copy – Hiding and Showing Layers – Flattening Images – Working with Adjustment Layers – Layer Effects - Type Tool: Changing the Type Settings – Type Masking

UNIT V: FLASH   (9 Hours)

Introduction to Flash – Flash Interface: Stage – Timeline – Library – Drawings and Symbols – Flash Project Properties – Timeline and Frames – Animation: Frame by Frame Animation – Tween Animation

Books for Study

1. C. Xavier, Web Technology and Design,2007, Blue Age International Publishers.
2. Schrand Richard, *Photoshop 6 visual Jumpstart*, 2000, Adobe Press.
3. Mohles L. James, *Flash 5.0 Graphics, Animation & Interaction*, Macromedia, 2000, World Press.

Books for Reference

1. Deitel , *Internet and World Wide Web How to Program*, Third Edition, 2003, Prentice Hall.
2. Reinhardt Robert, Lentz Warren Jon, *Flash 5 Bible*, 2001, Hungry Minds Inc.
3. Meenakshi G M, *Web Graphics*, 2007, SCITECH Publication.

Web References

1. https://www.geeksforgeeks.org/html-basics
2. https://www.educba.com/adobe-photoshop-tools
3. https://www.photoshopessentials.com/basics
4. www.tutorialboneyard.com/simple-flash-animation/
5. https://www.instructables.com/Flash-Animation-Basics

Teaching Methods

- ➢ Lecturing
- ➢ Group Discussions
- ➢ PPTs
- ➢ Learning by Doing
- ➢ Video tutorials

Course Outcomes:

On Successful completion of the course the students able to

CO1: Understanding the HTML concepts. (K2)

CO2: Apply HTML tags to 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: Understand the concepts of timeline motion to create simple Animation. (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	3	3	-	-	1	2	2	-	3	2	2	2	2	22
CO2	3	3	-	-	1	2	2	-	3	2	2	2	2	22
CO3	3	3	-	-	1	3	2	-	3	1	2	2	2	22
CO4	3	3	-	-	1	3	2	-	3	1	2	2	2	22
CO5	3	3	-	-	1	3	1	-	2	1	2	1	1	18
Grand total of COs with PSOs and POs														106
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)														2.12

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 Web Designing – Strongly related with PSOs and POs		

ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE
OPEN SOURCE TECHNOLOGY

Class	: B. Sc. (Comp. Sci.)	**Part**	: III SBE-2
Semester	: VI	**Hours**	: 45 Hours
Subject Code	:	**Credits: 02**	

Objectives:

The course enables the students to

- Understand the basics of Open Source Technology
- Understand the Open-Source Principles and Methodology
- Understand the structure of Linux OS and Implement the installation of Linux
- Apply Linux commands for basic operations, folder navigation and editing files
- Work with Directories and Files in Linux

UNIT-I   9 Hours

Introduction to Open-Source: Open Source, Need and Principles of OSS, Open-Source Standards, Requirements for Software, OSS success, Free Software, Examples, Licensing, Free Vs. Proprietary Software, Free Software Vs. Open-Source Software, Public Domain. History of free software, Proprietary Vs Open-Source Licensing Model, use of Open- Source Software, FOSS does not mean no cost. History: BSD, The Free Software Foundation and the GNU Project.

UNIT-II   9 Hours

Open-Source Principles and Methodology: Open-Source History, Open- Source Initiatives, Open Standards Principles, Methodologies, Philosophy, Software freedom, Open-Source Software Development, Licenses, Copyright vs. Copy left, Patents, Zero marginal cost, Income-generation Opportunities, Internationalization.

UNIT-III   9 Hours

Introduction to Linux - Distributions - Open Source - The Linux Shell - Root - Capitalization - Installing Linux Server Edition - Installing Linux Desktop Version

UNIT-IV   9 Hours

Basic Linux Tasks/Commands - Sudo - Man Pages - Tasksel - Apt-get - Services - Top Basic Linux Navigation - Editing Linux Files with Vim - Starting Vim - Changing File Ownership - Editing and Navigating - Exiting and Saving

UNIT-V   9 Hours

Advanced Linux Navigation - Changing Directories and Finding Files - Listing/Displaying Files Making, Deleting, Moving, Copying, Renaming - Mounting Drives

Books for Study:

1. Kailash Vadera&Bhavyesh Gandhi, Open-Source Technology , First Edition 2009, University Science Press, Laxmi Publications,
2. Adam Vardy, Linux for Beginners The Ultimate Guide to the Linux Operating System & Linux Commands, First Edition, 2016

Books for References:

1. Clay Shirky and Michael Cusumano, Perspectives on Free and Open-Source Software", MIT press.

2. Andrew M. St. Laurent, Understanding Open Source and Free Software Licensing, , O'Reilly Media.
3. Dan Woods, Gautam Guliani, Open Source for the Enterpris, O'Reilly Media

Web References
1. Linux Basics: https://nptel.ac.in/courses/117106113
2. Linux kernel Home: http://kernel.org4
3. Open-Source Initiative: https://opensource.org/5
4. The Linux Foundation: http://www.linuxfoundation.org/

Teaching Methods:
➢ Lectures
➢ Group Discussions
➢ PPTs
➢ Hands on Training
➢ Projects work

Course Outcomes:

On the successful completion of the course students will able to

CO1: Explore the basics of open source (K2)

CO2: Understand the Open source principles and methodologies. (K2)

CO3: Explore the Linux Structure and install the Linux OS (K3)

CO4: Apply basic commands of Linux, navigation and editing Linux file. (K3)

CO5: Apply the directory commands in Linux (K5)

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	3	-	-	2	3	2	2	3	2	3	3	3	29
CO2	3	3	-	-	2	3	2	2	3	2	3	3	3	29
CO3	3	3	-	-	2	3	2	2	3	2	3	3	3	29
CO4	3	3	-	-	2	3	2	2	3	2	3	3	3	29
CO5	3	3	-	-	2	3	2	2	3	2	3	3	3	29
Grand total of COs with PSOs and POs														145
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(145/55)														2.63

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			2.63
Observation	COs of Open Source Technologies – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
CBCS and OBE PATTERN
(Those who join from 2023-2024 onwards) For M.Sc (CS) Programme

Part	Semester – I	Credit	Hours per week
A	Core courses 3 (cc1, cc2, cc3) CC1 - Advanced Programming in Java CC2 - Advanced Programming in Java Lab CC3 - Web Development	12	15

	Elective courses-2(Generic/Discipline Specific)
	EC(1) - Mathematical Foundation for
	                    Computer Science
	                - Object Oriented Analysis and
	Design
	                - Object Oriented Software
	Engineering
	
	EC (2) - Distributed Operating System
	              - Data Communication Networking
	            - Computer Graphics and Multimedia
		6	10

B	Skill Enhancement Course -SEC1 Web Development –Lab	2	3
	Ability Enhancement Compulsory Course (AECC1) – Soft Skill1	2	2
		22	30

Part	Semester – II	Credit	Hours per week
A	Core courses 3 (cc4, cc5, cc6) CC4 – Mobile Application Development CC5 – Mobile Application Development Lab CC6 – Python Programming	12	15

	Elective courses-2(Generic/Discipline Specific)
	EC3 - Cloud Computing
	       - Internet of Things
	       - Machine Learning
	
	EC4 - Data Mining and Data Warehousing
	       - Artificial Intelligence
	       - Big Data Analytics
		6	10

B	Skill Enhancement Course -SEC2 Python Programming Lab	2	3
	Ability Enhancement Compulsory Course (AECC2) – Soft Skill2	2	2
		22	30

Part	Semester – III	Credit	Hours per week
A	Core courses 3 (cc7, cc8, cc9) CC7 – Visual Programming with C#.Net CC8 – Visual Programming with C#.Net Lab CC9 – Compiler Design	12	15
	Elective courses-1(Generic/Discipline Specific) EC5	3	5
	Core Industry module **EC5 –**Distributed Technologies 　　-Digital Image Processing 　　- Embedded Systems	**3**	**4**
B	Skill Enhancement Course -SEC3 Professional communication skill (Term paper & seminar presentation)	2	4
	Ability Enhancement Compulsory Course (AECC3) – Soft Skill3	2	2
	Internship / Industrial activity (carried out in summer vacation at the end of Sem II)	2	
		24	30

Part	Semester – IV	Credit	Hours per week
A	Core courses 3 (cc10, cc11, cc12) CC10- MEAN STACK Technology CC11 – MEAN STACK Technology Lab CC12 – Data Science	12	15
	Elective courses-1(Generic/Discipline Specific) EC6 Digital Forensics and Cyber Security Neural Networks Software Testing	3	5
	Project	**3**	**4**
B	Skill Enhancement Course -SEC3 Training for competitive examinations Quantitative Aptitude	2	4
	Ability Enhancement Compulsory Course (AECC4) – Soft Skill4	2	2
C	Extension activity (can be carried outside the class hours)	1	
		23	30

Total credits = 91

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class : M.Sc (CS)	**Part** : CC1
Semester : I	**Hours : 75**
Subject Code :	**Credit : 4**

ADVANCED PROGRAMMING IN JAVA

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)**

ManagingInput/outputFilesinJava:Conceptofstreams-Streamclasses-bytestreamClasses-characterstreamclasses-Exception-creationoffiles-reading/writingcharacter –Introduction to JDBC, Essential JDBC classes, Connecting to database, Inserting data in database, Retrieving data from database, deleting data in database, updating data in database, store image in the database, to retrieve image from database, to store file in database, retrieve file from database

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 .

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	30
CO2	3	2	3	1	2	2	-	-	3	3	-	3	2	28
CO3	3	2	3	1	2	3	-	-	3	3	-	2	3	30
CO4	3	1	2	1	2	3	-	-	3	3	-	3	3	28
CO5	3	1	2	1	1	3	-	-	3	3	-	3	3	28
Grand total of COs with PSOs and POs														144
Mean value of COs with PSO and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (144/60)														2.4

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 Advanced Programming in Java – Strongly related with PSOs and POs		

Class	: M.Sc (CS)	**Part**	: CC2
Semester	: I	**Hours**	: 75
Subject Code	:	**Credit**	: 4

ADVANCED PROGRAMMING IN JAVA 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. CMS(Content Management System) for College Website
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

JDBC

4. Display Employee Table using JDBC
5. Insert a Record in Employee Table using JDBC
6. Servlet Chaining

GENERICS

1. Simple generic class
2. Simple generic class with two type parameters
3. Implement bounded type with generics

Teaching Methods

- ➢ Lecturing
- ➢ PPTs

701

- ➢ 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

	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
Grand total of COs with PSOs and POs														138
Mean value of COs with PSOs and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}}$ = (138/50)														2.76

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 Programming in Java Lab– Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class	: M.Sc (CS)	**Part**	: CC3
Semester	: I	**Hours**	: 75
Subject Code	:	**Credit**	: 4

WEB DEVELOPMENT

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: 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, Document Type Definition (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 – objects – expressions – pattern matching using RegEXp Class – String Class – Exception Handling – Built–in objects – Bgcolor/Fgcolor – Date Object – Events and Event Handling – Validations – 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. 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

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‖, !st 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: Recall Web Basics, history of Internet and use 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: Write programs and establish database connectivity in Mysql. (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	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
CO4	3	2	1	2	2	1	-	-	3	3	-	2	2	21
CO5	3	2	1	2	2	1	-	-	3	2	-	1	1	18
Grand total of COs with PSOs and POs														107
Grand total with PSOs and POs														
Mean value of COs with PSOs and POs =$\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}}$= (107/49)														2.18

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			2.18
Observation	COs of Web Development – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class	: M.Sc (CS)	**Part**	: EC1
Semester	: I	**Hours**	: 75
Subject Code	:	**Credit**	: 03

MATHEMATICAL FOUNDATIONS FOR 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 **(15 Hours)**

Mathematical logic – Statements and notation – Connectives – Negation – Conjunction – Disjunction– Statement formulae and truth tables– Conditional and Bi-conditional-Wellformed formulas – Tautologies – Equivalences of formula – Duality Law. Predicate Calculus:Predicates – Statement functions – variables – Quantifiers – predate formulae – free & boundvariables.

UNIT II **(15 Hours)**

Basic concepts of set theory: Notation – Inclusion of equality of sets – power set – operation on sets – venn diagrams – Cartesian products. Relations and Ordering: Relations – Properties of Binary relation in a set – Relation matrix and graph – Equivalence relations – Composition ofbinary relations–Partial Ordering.

UNIT III **(15 Hours)**

Groups: Definition and examples – Sub groups – Homomorphism – Cosets – Normal Subgroups.

UNIT IV **(15 Hours)**

Graphtheory:BasicDefinitions–Paths,ReachabilityConnectedness–MatrixRepresentationofgraphs–Trees.

NIT V **(15 Hours)**

Grammarsandlanguages:Introduction–alphabet,words,languages–regularexpressions,regularlanguages-FinitestateAutomata–Grammers –GodelNumbers.

Books for Study

1. Lipschuta Seymour, Lipson Marc, *Discrete Mathematics*, Schaum'soutline Series,Tata McGraw Hill, New Delhi, 2007.
2. Trembley, Manohar, *Discrete Mathematics Structures with Applications to Computer Science*, Tata McGrawHill, New Delhi, 1997.

Books for Reference

1. Hopcroft, Joseph E.Ullman, Jeffery D, *Introduction to Automata Theory Languages and Computations*, Narosa Publishing House, New Delhi, 2014.
2. 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 subgroups.(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
Grand total of COs with PSOs and POs														106
Grand total with PSOs and POs														**2.20**
Meanvalue of COs with PSOs and POs= 106/48) / Number of COs relating with PSOs & POs														

Strong–3, Medium -2, Low-1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.20
Observation	COs of Mathematical Foundation for Computer Science–Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class	:M.Sc (CS)	**Part : EC1**
Semester	:I	**Hours: 75**
Subject Code	:	**Credit:03**

OBJECT ORIENTED ANALYSIS AND DESIGN

Objectives:

The course enables the students to

- Understand the basic concepts of OOPs and its development life cycle.
- Know the dynamic model and UML concepts.
- Understand several types of modeling diagrams and relationship between objects.
- Know the class designing, visibility and interoperability.
- Understand the debugging and testing processes.

UNIT I   (15 Hours)

An overview – Object basics – Object state and properties – Behavior – Methods – Messages – Information hiding – Class hierarchy – Relationships – Associations – Aggregations-Identity – Dynamic binding – Persistence – Metaclasses – Object oriented system development life cycle.

UNIT II   (15 Hours)

Introduction – Survey – Rumbugh, Booch, Jacobson methods – Patterns – Frameworks – Unified approach – Unified modeling language – Static and Dynamic models – UML diagrams – Class diagram – Usecase diagrams – Dynamic modeling – Model organization – Extensibility.

UNIT III   (15 Hours)

Identifying Usecase – Business object analysis – Usecase driven object oriented analysis – Usecase model – Documentation – Classification – Identifying object, relationships, attributes, methods – Super-sub class – A part of relationships Identifying attributes and methods – Object responsibility

UNIT IV   (15 Hours)

Design process – Axioms – Corollaries – Designing classes – Class visibility – Refining attributes – Methods and protocols – Object storage and object interoperability – Databases – Object relational systems – Designing interface objects – Macro and Micro level processes – The purpose of a view layer interface

UNIT V   (15 Hours)

Quality assurance – Testing strategies – Object orientation testing – Test cases – Test Plan – Debugging principles – Usability – Satisfaction – Usability testing – Satisfaction testing.

BOOK FOR STUDY

1. Ali Bahrami, "Object Oriented Systems Development", 1st Edition 2008, Tata McGraw Hill International, New Delhi.

BOOKS FOR REFERENCE

1. Craig Larman, "Applying UML and Patterns", 3rd Edition 2004, Pearson.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", 2nd Edition 2005, Pearson.
3. Bernd Bruegge, Allen H. Dutoit, "Object Oriented Software Engineering using UML, Patterns and Java", 2nd Edition 2004, Pearson.

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: Analyze the OOPs concepts to create an application. (K4)

CO2: Create a dynamic framework. (K6)

CO3: Application of Usecase diagrams for real-time objects. (K3)

CO4: Understand classes and interoperability between objects. (K2)

CO5: Test the software quality.(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	3	2	3	1	2	-	-	3	3	-	3	3	26
CO2	3	2	2	3	3	3	-	-	3	3	-	3	3	28
CO3	3	3	2	2	3	3	-	-	3	2	-	3	2	26
CO4	3	3	2	3	2	3	-	-	3	3	-	3	3	28
CO5	3	3	2	3	3	3	-	-	3	3	-	2	3	28
Grand total of COs with PSOs and POs														136
Mean value of COs with PSO and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (136/50)														2.4

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			2.72
Observation	COs of Object Oriented Analysis and Design – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class	: M.Sc (CS)	**Part**	: EC1
Semester	: I	**Hours**	: 75
Subject Code	:	**Credit**	: 03

OBJECT ORIENTED SOFTWARE ENGINEERING

Objectives:
The course enables the students to
- Understand the basic concepts of process and process models.
- Analyze system modeling requirement.
- Understand the various software design models and concepts.
- Analyze the various object oriented software testing strategies.
- Describe the UML concepts

UNIT I : INTRODUCTION   **(15 Hours)**
Generic view of Process – Software Engineering – A layered technology – A process framework – The capability Maturity Model Integration (CMMI) – Process patterns – Process Assessment – Personal and Team Process Models – Process Technology – Product and Process – Specialized Process Models – The Unified Process –Agility –Agile Process – Agile Process Models.

UNIT II : SYSTEM MODELING REQUIREMENTS   **(15 Hours)**
System Engineering - Computer Based Systems - System Modelling Requirements Engineering – A bridge to design and construction – Requirements engineering tasks, developing Use-Cases Building the analysis model – Requirement Analysis – Analysis modelling approaches – Data modelling concepts – Object- Oriented Analysis – Class based modelling

UNIT III : DESIGN ENGINEERING   **(15 Hours)**
Design Engineering – Design within the context of Software Engineering – Design Process and Design Quality Creating an Architectural Design – Software Architecture – Data design Modeling Component level design –Component- Designing Class-Based Components

UNIT IV : USER INTERFACE DESIGN   **(15 Hours)**
Performing User Interface Design – The Golden Rules – User Interface analysis and Design Testing Strategies – A strategic approach to software testing – test strategies for Object-Oriented Software Testing Tactics – Object Oriented Testing Methods

UNIT V :   **(15 Hours)**
Introducing the UML- Classes – Class Diagrams- Use cases- Use case diagrams- Case Study

Books for Study
1. Software Engineering - A Practitioner's Approach, Roger S. Pressman, 6th Edition, McGraw Hill Higher Education, 2014.
2. The UnifiedModeling Language User Guide, Grady Booch, James Rumbaugh and Ivar Jacobson, Pearson Education, 2007.

Books for Reference
1. Object Oriented Software Engineering, Ivar Jacobson, Magnus Christerson, Patrik Jonsson, Gunnar Overgaard, Pearson Education, Seventh Reprint, 2009.
2. Object Oriented Software Engineering, Yogesh Singh and Ruchika Malhotra, PHI Learning Pvt Ltd, 2012.
3. Applying UML and Patterns, Craig Larman, Third Edition, Pearson publication, 2012.

4. Object-Oriented Software Engineering, Stephen.R.Schach, First Edition, CTI Reviews, 2014.

Teaching Methods:
- Lecturing
- PPTs and PDF
- Case studies
- Video Tutorials

Course Outcome:
On the successful completion of the course students will able to
CO1: Understand the basic software engineering process concepts and models. (K2)
CO2: Analyze various requirement engineering tasks. (K4)
CO3: Implements various design models and concepts in projects. (K3)
CO4: Develop various software test cases for different strategies. (K5)
CO5: Evaluate managerial techniques and Software Quality Assurance. (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	2	2	1	2	2	3	-	-	3	2	-	1	3	21
CO2	2	2	2	1	2	2	-	-	3	3	-	2	3	22
CO3	3	2	2	2	2	3	-	-	3	3	-	2	3	25
CO4	2	2	1	2	1	2	-	-	2	3	-	2	2	19
CO5	2	2	1	2	2	1	-	-	2	2	-	2	3	19
Grand total of COs with PSOs and POs														106
Mean value of COs with PSO and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (106/50)														2.12

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			2.12
Observation	COs of Object Oriented Software Engineering – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class	:M.Sc	**Part**	: EC2
Semester	:I	**Hours:**	75
Subject Code	:	**Credits:**	03

DISTRIBURED 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 : INTRODUCTION   **(15 Hours)**

Fundamentals – Distributed computing systems – Evolution of distributed computing systems – Distributed computing system models – Popularity of distributed computing systems – Distributed operating system – issues in designing a distributed operating system – Introduction to distributed computing environment(DCE).

UNIT II : MESSAGE PASSING   **(15 Hours)**

Message Passing – Introduction – Desirable features of a good message-passing system – Issues in IPC by message passing – Synchronization – Buffering – Multidatagram messages – Remote Procedure Calls – Introduction – The RPC model – Transparency of RPC – Implementing RPC mechanism.

UNIT III : DISTRIBUTED SHARED MEMORY   **(15 Hours)**

Distributed Shared Memory – Introduction – General architecture of DSM systems – Design and implementation issues of DSM – Synchronization – Introduction – Clock synchronization – Election Algorithms. Resource Management – Introduction – Desirable features of a good global scheduling algorithm – load sharing approach.

UNIT IV : PROCESS MANAGEMENT   **(15 Hours)**

Process Management – Introduction – Process migration - Distributed File Systems – Introduction – Desirable features of a good distributed file system – File models– File-Accessing models – File-Sharing semantics – File-Caching schemes – File replication – Fault tolerance.

.**UNIT V :LINUX**   **(15 Hours)**

The Linux Shell and File Structure: The Shell – The Command Line – History – Filename Expansion – Standard Input/Output and Redirection – Pipes – Ending Processes .

Books for Study

1. Distributed Operating Systems Concepts and Design, Pradeep K. Sinha, Prentice Hall of India Private Limited, 2012.
2. Linux: The Complete Reference, Richard Petersen, McGraw Hill Education (India) Private Limited, 6th Edition, 2011.

Books for Reference

1. Operating Systems, Stuart Madnick, John Donovan,McGraw Hill Education, 2012.
2. Distributed Operating Systems,   Andrew S. Tanenbaum, Pearson Education, New Delhi, 2013.
3. Beginning Linux Programming, Neil Matthew, Richard Stones, Wiley India Pvt. Ltd,2014

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: Discuss the core concepts of distributed systems.

CO2: Analyze various message passing mechanisms with its model. (K2)

CO3: Identify the inherent difficulties that arise due to distribution of computing resources (K2)

CO4: Explain migration with the process management policies (K4)

CO5: Explain the design and structure of the LINUX operating systems(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	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
Mean value of COs with PSO and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (110/50)														2.2

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			2.22
Observation	COs of Distributed Operating System –Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class : M.Sc (CS)	**Part** : EC2
Semester : I	**Hours** : 75
Subject Code :	**Credits: 03**

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 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
Grand total of COs with PSOs and POs														117
Mean value of COs with PSO and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (117/48)														2.44

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 Data Communications and Networking –Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class	: M.Sc (CS)	**Part : EC2**
Semester	: I	**Hours : 75**
Subject Code	:	**Credit : 03**

COMPUTER GRAPHICS AND MULTIMEDIA

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. RebenschiedShane, *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
Grand total of COs with PSOs and POs														105
Mean value of COs with PSOs and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (105 / 50)														2.10

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– Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class	: M.Sc (CS)	**Part**	: SEC1
Semester	: I	**Hours**	: 45
Subject Code	:	**Credit**	: 02

WEB DEVELOPMENT 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. Internal CSS
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

13. Timely Wishes
14. Biggest And Smallest
15. Area And Perimeter
16. Simple And Compound Interest
17. Net Salary Calculations
18. User Name And Password Validations
19. Purchase Rate Using Options
20. Change Background Color
21. Calculator
22. Digital Clock
23. Online Exam
24. History Object
25. All Collection
26. Style Sheet Collection

- ✓ No of Style Sheet
- ✓ Add Style Sheet
- ✓ Enable and Disable Style Sheet
- ✓ Add Rule to Style Sheet

PHP& MYSQL
27. Create Table
28. Insert Records
29. Select Records
30. Update And Delete Records
31. Prepare Statements
32. 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

	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	1	-	-	3	1	-	1	1	20
CO2	3	2	3	3	1	1	-	-	3	1	-	1	1	18
CO3	3	2	3	3	2	1	-	-	3	1	-	2	1	21
CO4	3	2	3	3	1	2	-	-	3	3	-	2	3	25
CO5	3	2	3	3	1	2	-	-	2	1	-	2	3	22
Grand total of COs with PSOs and POs														106
Mean value of COs with PSOs and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (106 / 50)														2.12

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			2.12
Observation	COs of Web Development– Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
MOBILE APPLICATION DEVELOPMENT

Class	:M.Sc (CS)	**Part**	:CC4
Semester	:II	**Hours**	:75
Subject Code	:	**Credits**	:04

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.

UNITI: **(15 HOURS)**

Introduction to React Native-Advantages of React Native-Risk and Draw Backs-Working with React Native-Rendering life cycle-Creating Components in React Native-Working with views-JSX-Styling Native Components-Building your first Application-Setting up-Installing-ios Dependencies-Android Dependencies-Creating new Application-Running react native on ios-Running React Native on Android.

UNITII: **(15 HOURS)**

Imports in React Native-Project Components-Building Weather app-Handling user Input-Displaying Data-Adding background Image-Fetching Data from the Web-Components for mobile-Analogy between HTML elements and Native components-Text Components-Image Component-Using Touchable Highlight-React Pan Responder-Working with Organizational Components-Navigators.

UNIT: III **(15 HOURS)**

Styles-Declaring and Manipulating styles-Inline Style-Styling with Objects-style Concatenation-Exploring style object-Passing Styles as Prop-Reusing and Sharing Styles-Positioning and Designing Layouts-Layouts with Flexbox-Platform API-Geolocation-Handling Permission-Accessing User Image and Camera-Uploading Image to server.

UNITIV: **(15 HOURS)**

Debugging-Debugging with Console.log-Using Java script Debugger-Working with the react developer tools-React Native Debugging Tools- Common Xcode Problems-Common Android Problems-issues deploying to an ios device.

UNITV: **(15 HOURS)**

Deploying to ios App Store-Preparing xcode project-selecting and target ios version-Launch Screen Images-Adding Application icon-Deploying Android application-Launch icon setting-Building the API for release-Beta Testing-Submitting app to play store.

Book for Study

1. Bonnie Eisenmen, "Learning React Native- Building Native Mobile App with Java
   Script", 2016, First Edition, O' Reilly Media Inc.

Teaching Methods
- Lecturing
- Group Discussions
- PPTs

- ➢ Learnby Doing
  - ➢ Videotutorials

Course Outcomes

On the successful completion of the course students will be able to:

CO1: Understand React Native Applications(K2)

CO2: Apply knowledge to create project.(K3)

CO3: Create Component Elements.(K6)

CO4: Analyze debugging of react Native application (42)

CO5: Create Apps for Publish on Play store.(K6)

K1=RememberK2=Understand   K3=ApplyK4=AnalysisK5=EvaluateK6=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	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
Grand total of COs with PSOs and POs														135
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)														**2.7**

Strong – 3, Medium -2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.7
Observation	COs of Mobile Application Development–Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
MOBILE APPLICATION DEVELOPMENT –LAB

Class	:M.Sc(CS)	**Part**	:CC5
Semester	:II	**Hours**	:75
Subject Code	:	**Credit**	:04

Objectives:

The course enables the students to

- Understand the framework for mobile emulators and devices
- Understand project folder structure.
- Understand the concepts of react Native Components and Templates
- Develop programs using native components
- Design and Develop database connectivity

List of Programs

1. Create a basic React Native app that displays "Hello, World!" on the screen.
2. Create a simple calculator that can perform basic arithmetic operations (addition, subtraction, multiplication, and division).
3. Create a weather app that fetches data from a weather API and displays the current temperature and weather conditions for a specific location.
4. Create a calendar app in react native
5. Create a user-login form that takes in a username and password, and displays a success message if the login is successful.
6. Create a music app using react native.
7. Create a location-based app that uses the device's GPS to display the user's current location and nearby points of interest on a map.
8. Photo gallery APP in React Native
9. Car booking app
10. Database connectivity with react native

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 variables, class and string in Programming.(K3)
CO3: Create programs using react native Components and Templates.(K6)
CO4: Apply Native mobile programming concepts in developing mobile App.(K3)
CO5: Develop database app for mobile applications.(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	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
Grand total of COs with PSOs and POs														130
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)														2.6

Strong–3,Medium -2,Low-1

Mapping Scale	1	2	3
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
PYTHON PROGRAMMING

Class : M.Sc (CS)		**Part** : CC7
Semester : II		**Hours** : 75
Subject Code :		**Credit** : 4

Objectives:

The course enables the students to

- Explore knowledge domains and implications of data analysis process
- Understand python coding conventions and constructs
- Explore methods and attributes of numpy library of python
- Explore methods and attributes of pandas library of python
- Explore methods and attributes of matplotlib library of python

UNIT- I: INTRODUCTION TO DATA ANALYSIS   (15 HOURS)

Knowledge domains – Nature of Data – Data Analysis process – Data definition – Data extraction – Data preparation – Data Visualization – Data modelling – Model validation – Deployment – Quantitative data analysis – Qualitative data analysis – Open data sources – Case study: An example of Meteorological data

UNIT II: INTRODUCTION TO PYTHON   (15 HOURS)

Primitive Data types – operators – statements – control structures – conditional constructs – looping constructs - strings – List – Tuples – set – Dictionaries – functions – files – operations on file objects – GUI programming with tkinter – widgets and containers – Database Programming with mysqlDB – Creating table objects – manipulating table objects – SQL statements – Miscellaneous standard libraries

UNIT- III: THE NUMPY LIBRARY   (15 HOURS)

Creating an array object – Intrinsic creation of an array – Arithmetic operators – Increment and Decrement operators – Universal functions – Aggregate functions – Indexing arrays – Slicing arrays – Iterating arrays – Boolean arrays – Structured array – Array manipulation

UNIT IV: THE PANDAS LIBRARY   (15 HOURS)

Pandas data structures – The Series – The Dataframe – The Index object – Reindexing – dropping – Arithmetic and data alignment – Flexible Arithmetic methods – Operation between Dataframe and series – Functions by elements – Functions by rows – Functions by columns – Statistics functions – Sorting and Ranking – Correlation and Covariance

UNIT V: THE MATPLOTLIB LIBRARY   (15 HOURS)

Data Visualization with matplotlib – 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

Books for study

1. Fabio Nelli, Python Data Analytics: Data Analysis and Science using pandas, matplotlib and the python programming language, APress , 2015
2. Magnus Lie Hetland, Beginning Python: From novice to professional, APress, 2008

Books for Reference
1. Wes McKinney, Python for Data Analysis, , 201,O'Reilly.
2. Peters Morgan, Data Analysis from scratch with Python: Step by step guide, 2016, AI Sciences.

Course Outcomes

On the successful completion of the course the students will able to

CO1: Explore on data analysis process and its knowledge domains (K3)

CO2: Understand python code constructs and their applications (K2)

CO3: Incorporate in-built methods and attributes of NumPy library of Python for array manipulation (K4)

CO4: Incorporate methods of Pandas library for statistical manipulations and to implement statistical functions (K4)

CO5: Implement Data visualization using matplotlib of python (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
Grand total of COs with PSOs and POs														133
Mean value of COs with PSOs and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (133 / 50)														2.66

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			2.66
Observation	COs of Python Programming – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class	: M.Sc (CS)	Part : EC3
Semester	: II	Hours : 75
Subject Code	:	Credit : 03

CLOUD COMPUTING

Objectives:
The course enables the students to
- Understand the cloud architecture
- Analyze about the tools and mechanism of virtualization
- Understand the process of cloud storage and resource management
- Compare various programming paradigms
- Understand the concepts of cloud security

UNIT I   CLOUD ARCHITECTURE AND MODEL   (15 HOURS)
Technologies for Network-Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture. Cloud Models:- Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public vs Private Cloud –Cloud Solutions - Cloud ecosystem – Service management – Computing on demand.

UNIT II   VIRTUALIZATION   (15 HOURS)
Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation.

UNIT III   CLOUD INFRASTRUCTURE   (15 HOURS)
Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – Design Challenges - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

UNIT IV   PROGRAMMING MODEL   (15 HOURS)
Parallel and Distributed Programming Paradigms – MapReduce , Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim.

UNIT V   SECURITY IN THE CLOUD   (15 HOURS)
Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

Books for Study
1. Hwang Kai, Fox Geoffrey. C, DongarraJack. G, *Distributed and Cloud Computing, From Parallel Processing to the Internet of Things*, Morgan Kaufmann Publishers, 2013
2. Ritting house John.W, Ransome. F, *Cloud Computing: Implementation, Management, and Security*,CRC Press, 2009

Books for Reference

1. Buyya Rajkumar, Vecchiola Christian, S Thamarai Selvi , *Mastering Cloud Computing*, Tata McGraw-Hill Education, 2013
2. VelteToby, Velte, Elsenpeter Robert, *Cloud Computing, A Practical Approach*, Tata McGraw-Hill Professional, 2009
3. SaurabhKumar, *Cloud Computing – Insights into New-Era Infrastructure*, Wiley India, 2011,
4. Reese George, *Cloud Application Architectures: Building Applications and Infrastructure in the Cloud*, O'Reilly Media, Inc, 2009,

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 cloud architecture. (K2)

CO2: Apply the concept of virtualization. (K3)

CO3: Analyze the usage of cloud resources. (K4)

CO4: Evaluate different types of programming paradigms. (K5)

CO5: Analyze the cloud security issues. (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	3	1	1	2	-	-	3	3	-	3	3	25
CO2	3	3	3	2	2	3	-	-	3	3	-	3	3	28
CO3	3	3	3	2	1	3	-	-	3	3	-	3	3	27
CO4	3	3	3	2	2	3	-	-	3	3	-	3	3	28
CO5	3	3	3	3	2	3	-	-	3	3	-	3	3	29
Grand total of COs with PSOs and POs														137
Mean value of COs with PSOs and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (137 / 50)														2.74

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			2.74
Observation	COs of Cloud Computing– Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)- KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class   : M.Sc (CS)   Part   : EC3
Semester   : II   Hours : 75
Subject Code :   Credit : 03

INTERNET OF THINGS

Objectives:
The course enables the students to
- Understand the basic concepts in IoT
- Analyze varies 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   (15 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   (15 HOURS)
Temporary and Ad-hoc devices-Addressing issues-End devices in dedicated networks- Small dataBuilding 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: (15 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: (15 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 – 5 CASE STUDIES ILLUSTRATING IOT DESIGN   (15 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*, Apress open publication, 2013.
2. Waher Peter, *Learning Internet of Things*, PACKT Publishing-Birmingham-Mumbai, 2015,

Books for Reference:
1. Bahga Arhdee, Madisetti Vijay, *Internet of Things: A Hands on Approach* (http://www.internet-of-things-book.com/).
2. Pfister Cuno, *Getting started with the Internet of Things*, O'Rielly Publication.

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: Apply Data and Human Interaction concepts inIoT. (K3)

CO4: Develop IoT Applications for real time applications. (K3)

CO5: Evaluate various case studies in IoT Applications.(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	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
Grand total of COs with PSOs and POs														**110**
Mean value of COs with PSOs and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (110 / 45)														**2.40**

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			2.40
Observation	COs of Internet of Things – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class   : M.Sc (CS)   Part   : EC4
Semester   : II   Hours : 75
Subject Code :   Credit : 03

MACHINE LEARNING

Objectives:

The course enables the students to
- Understand Concepts of design in learning system
- Describe the Decision in Tree learning
- Compare the Algorithms in machine learning
- Analyze the Bayes theorem and concept learning
- Distinguish Analytical and inductive learning

UNIT – 1 INTRODUCTION   (15 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   (15 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.

UNIT – 3 ANN   (15 HOURS)

Perceptions - Back propagation Algorithms. Evaluating Hypothesis: Deriving confidence intervals - Hypothesis testing - comparing learning algorithms.

UNIT – 4 BAYESIAN LEARNING   (15 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   (15 HOURS)

Analytical learning - Explanation based learning - Inductive Analytical approaches to learning - Using prior knowledge to, initialize the hypothesis, alter the search objective and augment search operators.

Book for Study

1. Mitchell Tom M, *Machine Learning*, McGraw-Hill Education (India) Private Limited, 2003,

Books for Reference

1. Ethem Alpaydin Tom M ., *Introduction to Machine Learning*, Second Edition, MIT Press , 2010
2. Marsland Stephan, *Machine Learning - An Algorithmic Perspective*", First Edition, Chapman and Hall, 2009
3. Nils Nilsson, *Introduction to Machine Learning*, MIT Press, 1997,

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: UnderstandConcept of Bayes theorem in learning. (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
Grand total of COs with PSOs and POs														98
Mean value of COs with PSOs and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (98 / 50)														1.96

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 – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class : M.Sc (CS)		**Part : EC4**
Semester : II		**Hours : 75**
Subject Code :		**Credit : 03**

DATA MINING AND DATA WAREHOUSING

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   **(15 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   **(15 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   **(15 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   **(15 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   (15 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.

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
CO1	3	2	-	-	2	3	2	1	3	2	3	1	3	25
CO2	3	2	-	-	2	2	1	2	3	3	2	2	3	25
CO3	3	2	-	-	2	3	1	1	3	3	2	2	3	25
CO4	3	2	-	-	1	2	2	-	2	3	2	1	2	20
CO5	3	2	-	-	2	3	2	1	3	2	3	1	3	25
Grand total of COs with PSOs and POs														120
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)														2.22

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			2.22
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 : M.Sc (CS)	**Part** : EC4
Semester : II	**Hours: 75**
Subject Code :	**Credit: 03**

ARTIFICIAL INTELLIGENCE

Objectives:

The course enables the students to

- Understand the concepts of Artificial Intelligence
- Understand the Parsing Techniques and concept of grammars
- Describe the Knowledgeable Representation of Net sand Grammar Theory
- Understand the concepts of Expert Systems
- Understand the use of Pattern Recognition in Programming Language

UNIT-I(INTRODUCTION) **(15 HOURS)**

IntroductiontoArtificialIntelligence,Simulationofsophisticated&IntelligentBehaviorindifferentarea,problemsolvingingames,naturallanguage,automatedreasoningvisualperception,heuristicalgorithmversussolutionguaranteedalgorithms.

UNIT-II(UNDERSTANDINGNATURALLANGUAGES) **(15 HOURS)**

Parsing techniques, context free and transformational grammars, transition nets, augmented transition nets, Fillmore's grammars, Shanks Conceptual Dependency, grammar free analyzers, sentence generation,and translation.

UNIT-III(KNOWLEDGEREPRESENTATION) **(15 HOURS)**

First order predicate calculus, Horn Clauses, Introduction to PROLOG, Semantic Nets Partitioned Nets, Minskey frames, Case Grammar Theory, Production Rules Knowledge Base, The Inference ystem,Forward &Backward Deduction.

UNIT-IV(EXPERTSYSTEM) **(15 HOURS)**

Existing Systems (DENDRAL, MYCIN), domain exploration, Meta Knowledge, Expertise Transfer, Self-Explaining System.

UNIT-V(PATTERNRECOGNITION) **(15 HOURS)**

Introduction to pattern Recognition, Structured Description, Symbolic Description, Machineperception,LineFinding,Interception,Semantic,&Model,ObjectIdentification,SpeechRecognition,ProgrammingLanguage:IntroductiontoprogrammingLanguage,LISP,PROLOG

BOOKSFORREFERENCE

1. Charniak Eugene, *Introduction to Artificial Intelligence*", Addision Wesley.
2. Charniak Rich, Knight ,*Artificial Intelligence, Tata McGraw Hill Publications*
3. Winston, *LISP*, Addison Wesley, Marcellous,"Expert Systems Programming", PHI.

Teaching Methods

- ➢ Lecturing
- ➢ Group Discussions
- ➢ PPTs
- ➢ Learn by Doing
- ➢ VideoTutorials

Course Outcomes

On the successful completion of the course students will be able to:

CO1: Understand the Basic principles and identify the problems that area men able to solution by AI methods.(K2)

CO2: Understand and Implement the concept of Expert Systems.(K2)

CO3: Analysis the Representation of Nets and Grammar Theory. (K4)

CO4: Evaluate the concept of Expert Systems.(K5)

CO5: Apply the Pattern to Recognize and Programming Language(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	2	2	3	3	2	-	-	3	1	-	3	3	25
CO2	3	2	3	1	1	2	-	-	3	1	-	3	3	22
CO3	3	2	3	2	2	2	-	-	2	1	-	2	2	21
CO4	3	3	2	2	1	2	-	-	3	1	-	2	2	21
CO5	2	2	2	1	2	1	-	-	2	1	-	2	3	18
Grand total of COs with PSOs and POs														**107**
Mean value of COs with PSOs and POs = **Grand total with PSOs and POs** ──────────────────── = (107/50) **Number of COs relating with PSOs& POs**														**2.14**

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			2.14
Observation	COs of Artificial Intelligence – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class   : M.Sc (CS)   Part   : EC4
Semester   : II   Hours : 75
Subject Code :   Credit : 03

BIG DATA ANALYTICS

Objectives:
The course enables the students to
- Understand the characteristics and challenges of Big Data
- Illustrate the Big Data Analytics
- Explain Hadoop for Big Data Technologies
- Describe Map Reduce Programming
- Demonstrate the types of Recommended Systems

UNIT I : INTRODUCTION   (15 Hours)
Introduction to Big Data: Characteristics of Data – Evolution of Big Data – Definition of Big Data – Challenges with Big Data – Other Characteristics of Data which are not Definitional Traits of Big Data - Traditional Business Intelligence (BI) versus Big Data – A Typical Data warehouse Environment – A Typical Hadoop Environment – What is changing in the Realms of Big Data

UNIT II: BIG DATA ANALYTICS   (15 Hours)
Big Data Analytics: Classification of Analytics – Greatest Challenges that Prevent Businesses from Capitalizing on Big Data – Top Challenges Facing Big Data – Why is Big Data Analytics Important – What kind of Technologies are we Looking Toward to Help Meet the Challenges Posed by Big Data – Data Science – Data Scientist Your New Best Friend - Terminologies Used in Big Data Environments – Basically Available Soft State Eventual Consistency – Few Top Analytics Tools.

UNIT III: THE BIG DATA TECHNOLOGY   (15 Hours)
The Big Data Technology Landscape: – Hadoop – Features of Hadoop – Key advantages of Hassop, Version of Hadoop – Overview of Hadoop Ecosystems - Hadoop distributions – Hadoop versus SQL – Integrated Hadoop System Offered by Leading Markers Vendors- Cloud – based Hadoop Solutions. Introduction to Hadoop: Introducing Hadoop – Why Hadoop – Why not RDBMS – RDBMS versus Hadoop – Distributed Computing Challenges – History of Hadoop – Hadoop Overview – Use Case of Hadoop – Hadoop Distributors – HDFS (Hadoop Distributed File System) – Processing Data with Hadoop – Managing Resources and Applications with Hadoop YARN (Yet Another Resource Negotiator) – Interacting with Hadoop Ecosystem.

UNIT IV :INTRODUCTION TO MAP REDUCE PROGRAMMING   (15 Hours)
Introduction to MAP REDUCE Programming: Introduction – Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression.Introduction to Machine Learning: Introduction to Machine Learning – Machine Learning Algorithm-Regression Model- Linear Regression- Clustering- Collaboration filtering- Association Rule Mining- Decision Tree.

UNIT V: RECOMMENDATION ENGINES   (15 Hours)
Introduction to Recommendation Engines: Recommendation engine definition – Need for Recommender Systems – Big Data Driving the Recommender Systems   – Types of Recommender Systems –Evolution of Recommender Systems with Technology. Evolution of Recommendation Engines Explained: Evolution of Recommendation   Engines   –   Nearest

Neighborhood-based   Recommendation Engines – Content-based Recommender Systems – Hybrid Recommender Systems– Model-based Recommender Systems.

Books for Study
1. Big Data and Analytics, Seema Acharya   and Subhashini Chellappan, 2nd edition ,Wiley India Private Limited, 2017.   Chapters : 2,3, 4.2 - 5, 8,12.
2. Building Recommendation Engines. -Suresh Kumar Gorakala, 1st edition, Packt Publishing Limited, United Kingdom, 2016. Chapters: 1, 3

Books for Reference
1. Big Data Strategies , Pam Baker ,1st edition , Cengage Learning India Private Limited, 2016.
2. Big Data,Dr. Anil Maheshwari, 1st edition , Published by McGraw Hill Education (India) Private Limited, 2017.
3. Big   Data Fundamentals Concepts,   Driver &   Techniques,   Thomas Erl,WajidKhattak and Paul Buhler, 3rd Edition, Pearson publication, 2018.

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 Big Data (K2)
CO2: Understand the basic concepts of Big Data Analytics (K2)
CO3: Apply Hadoop for appropriate applications (K3)
CO4: Able to analyze Map Reduce Programming (K4)
CO5: Identify and apply the Recommended Systems on Big Data. (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	2	-	-	2	3	2	1	3	2	3	1	3	25
CO2	3	2	-	-	2	2	1	2	3	3	2	2	3	25
CO3	3	2	-	-	2	3	1	1	3	3	2	2	3	25
CO4	3	2	-	-	1	2	2	-	2	3	2	1	2	20
CO5	3	2	-	-	2	3	2	1	3	2	3	1	3	25
Grand total of COs with PSOs and POs														120
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)														2.22

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			2.22
Observation	COs of Big Data Analytics – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
PYTHON PROGRAMMING LAB

Class	: M.Sc (CS)	**Part**	: SEC2
Semester	: II	**Hours**	: 45
Subject Code	:	**Credit**	: 03

Objectives:

The course enables the students to

- Explore knowledge on collection data types in python
- Practice standard libraries and in-built methods for array processing
- Implement data analysis process by using numerical library of python
- Implement statistical distributions and functions with pandas libraries
- Develop simple tool for the implementation of regression based machine learning algorithms

Program List

1. Implement data analysis process using collection data types
2. Create an user interface for a typical data form using GUI containers and widgets
3. Implement statistical functions by using pre-processed database objects.
4. Implement various array manipulation methods using NumPy of Python
5. Implement probability distribution functions using NumPy of Python
6. Implement vectorization by using universal functions of NumPy of Python
7. Implement Data cleaning process for a given dataset. Consider all possible cases to fix bad data of the given dataset
8. Create a database and generate scatter plot for the pre-processed table of data using pandas of Python
9. Create a database and generate histogram for stored dataset using pandas of python
10. By using database, generate decision tree by using pandas of Python
11. Create a database and generate line graph plot by using PlotPy of matplotlib
12. Create a database and generate bar graph by using PloyPy of matplotlib
13. Create a database and generate Pie graph by using PloyPy of matplotlib
14. Implement linear regression for a given datasets. Use database as data source
15. By using database, implement polynomial regression by using matplotlib
16. By using database, implement unsupervised learning method by using matplotlib

Course Outcomes

On the successful completion of the course the students will able to

CO1: Understand collection data types and their methods (K2)
CO2: Explore standard libraries and in-built functions to handle arrays (K3)
CO3: Apply numerical in-built libraries for implementing data analysis process (K4)
CO4: Incorporate pandas library for implementing statistical functions and distributions(K4)
CO5: Develop simple tool for regression analysis (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	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
Grand total of COs with PSOs and POs														133
Mean value of COs with PSOs and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (133/50)														2.66

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			2.66
Observation	COs of Python Programming Lab – Strongly related with PSOs and POs		

DEPARTMENT OF
COMPUTER APPLICATIONS

ARUL ANANDAR COLLEGE (AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
CBCS and OBE PATTERN
(Those who join from 2022-2023 onwards) For Two Years MCA

Part	Sub.Code	Title	Hours Per week	Credits
Semester I				
Core	22PCAC11	**Core-1** Data Structure using C++	4	4
	22PCAC21	**Core-2** Digital Computer Architecture	4	4
	22PCAC31	**Core-3** Mathematical Foundations of Computer Science	4	4
	22PCAC41	**Core-4** Relational Database Management Systems	4	4
Practical	22PCAP11	**Core Lab1**-Data Structure using C++ Lab	5	3
	22PCAP21	**Core Lab2**-RDBMS Lab	5	3
Core Elective I	22PCAE11	Computer Graphics and Multimedia Systems	4	3
		Software Testing		
		Principles of Management		
		Total	**30**	**25**
Semester II				
Core	22PCAC52	**Core-5** Advanced Java Programming	4	4
	22PCAC62	**Core-6** Operating Systems	4	4
	22PCAC72	**Core-7** Web Programming	4	4
	22PCAC82	**Core-8** Computer Networks & Security	4	4
Practical	22PCAP32	**Core Lab3**-Advanced Java Programming Lab	5	3
	22PCAP42	**Core Lab4**-Web Programming Lab	5	3
CoreElectiveII	22PCAE22	Organizational Behavior	4	3
		Object Oriented Analysis and Design		
		Open Source Technologies		
		Total	**30**	**25**
Semester III				
Core	22PCAC93	**Core-9** Data Analysis using Python	4	4
	22PCAD03	**Core-10** Programming Smart Devices	4	4
	22PCAD13	**Core-11** Data Mining and Data Warehousing	4	4
	22PCAD23	**Core-12** Machine Learning	4	4
Practical	22PCAP53	**Core Lab 5**–Data Analytics using Python Lab	5	3

	22PCAP63	**CoreLab6**-Mobile App Development Lab	5	3
Core Elective III	22PCAE34	Artificial Intelligence	4	3
		Cloud Computing		
		Internet of Things		
		Total	30	25
		Semester IV		
Core	22PCAD34	**Core-13**-Dot Net Programming	4	4
	22PCAD44	**Core-14**-Software Engineering	4	4
	22PCAD54	**Core-15** Project Viva Voce	-	6
	22PCAD64	**Comprehensive Viva**	-	1
Practical	22PCAP74	**CoreLab-7** Dot Net Programming-Lab	5	2
		Total	13	17

Credits for each Semester

Semester	I	II	III	IV	Total
Credits	**25**	**25**	**25**	**17**	**92***

Core	**: 83**
Core Elective	**: 09**
Total	**: 92***

*Self Learning Courses
1. **SWAYAM/MOOC**
2. **NPTEL**
3. **AnyOnlineCertifiedCourseofferedbyIITthatisrecognizedbyMHRD(Eachpaperisawar dedwith2creditsattheendofthecourse)**

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
(Outcome Based Syllabus under CBCS Structure for the students
admitted from the Academic Year 2022-2023)
Programme Outcome (PO)

PO1: Demonstrate profound comprehension of the concepts, theories, and principles in the disciplinary knowledge and appreciate its contextual significance.

PO2: Conceptualize the theories, formulate decision making models, and design solutions to the growing national needs together with thereflective analysis of its implications.

PO3: Develop the skills of analytical reasoning and associate the relevance of the theoretical concepts in various perspectives

PO4: Critically evaluate the practical utility of translating theory into praxis and lab into land towards societal upliftment.

PO5: Undertake creative research initiatives with innovative Trans-disciplinary approach for catering the contemporary needs of rural development.

PO6: Empower themselves by digital, communication, programming and professional skills for a suitable career in this competitive globe.

PO7: Engage in self-directed and life-long learning and elicit optimal personality by rising in leadership qualities, active involvement in team work, and collaboration with the members of the diverse cultural groups in the society.

PO8: Emerge as responsible citizens with the awareness of their role in promoting environmental sustainability and gender equity together with the adsorption of ethical, social, moral and cultural values.

PROGRAMME SPECIFIC OUTCOMES (PSO)

On completion of MCA programme, the students are expected to

PSO1: Understand and apply the technical and domain knowledge on analysis, design and development of applications in the computing discipline.

PSO2: Use of recent technology, skill and knowledge for computing practice with commitment on societal, moral values.

PSO3: Work professionally with positive attitude as an individual or in multidisciplinary teams and communicate effectively.

PSO4: Ability to utilize modern computer technologies, environments, and platforms in creating innovative career paths to be an employable, and contribution towards society.

PSO5: Inculcate employability and entrepreneur skills among students who can develop customizes solutions for small to large Enterprises

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
DATA ANALYSIS WITH PYTHON

Class : MCA	Part : III Core 9
Semester : III	Hours : 60
Subject Code :	Credit : 4

Objectives:

The course enables the students to

- Explore knowledge domains and implications of data analysis process
- Understand python coding conventions and constructs
- Explore methods and attributes of numpy library of python
- Explore methods and attributes of pandas library of python
- Explore methods and attributes of matplotlib library of python

UNIT- I: INTRODUCTION TO DATA ANALYSIS   **(12 HOURS)**

Knowledge domains – Nature of Data – Data Analysis process – Data definition – Data extraction – Data preparation – Data Visualization – Data modelling – Model validation – Deployment – Quantitative data analysis – Qualitative data analysis – Open data sources – Case study: An example of Meteorological data

UNIT II: INTRODUCTION TO PYTHON   **(12 HOURS)**

Primitive Data types – operators – statements – control structures – conditional constructs – looping constructs - strings – List – Tuples – set – Dictionaries – functions – files – operations on file objects – GUI programming with tkinter – widgets and containers – Database Programming with mysqlDB – Creating table objects – manipulating table objects – SQL statements – Miscellaneous standard libraries

UNIT- III: THE NUMPY LIBRARY   **(12 HOURS)**

Creating an array object – Intrinsic creation of an array – Arithmetic operators – Increment and Decrement operators – Universal functions – Aggregate functions – Indexing arrays – Slicing arrays – Iterating arrays – Boolean arrays – Structured array – Array manipulation

UNIT IV: THE PANDAS LIBRARY   **(12 HOURS)**

Pandas data structures – The Series – The Dataframe – The Index object – Reindexing – dropping – Arithmetic and data alignment – Flexible Arithmetic methods – Operation between Dataframe and series – Functions by elements – Functions by rows – Functions by columns – Statistics functions – Sorting and Ranking – Correlation and Covariance

UNIT V: THE MATPLOTLIB LIBRARY   **(12 HOURS)**

Data Visualization with matplotlib – 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

Books for study
1. Fabio Nelli, Python Data Analytics: Data Analysis and Science using pandas, matplotlib and the python programming language, APress , 2015
2. Magnus Lie Hetland, Beginning Python: From novice to professional, APress, 2008

Books for Reference
1. Wes McKinney, Python for Data Analysis, 201,O'Reilly.
2. Peters Morgan, Data Analysis from scratch with Python: Step by step guide, 2016, AI Sciences.

Web References
1. Python for Data Science, https://swayam.gov.in/
2. Python for Data Science and Machine Learning Bootcamp, https://www.udemy.com/
3. Introduction to Python Programming, https://www.udacity.com/
4. PYTHON - A to Z Full Course for Beginners, https://www.udemy.com/

Course Outcomes
On the successful completion of the course the students will able to

CO1: Explore on data analysis process and its knowledge domains (K3)

CO2: Understand python code constructs and their applications (K2)

CO3: Incorporate in-built methods and attributes of NumPy library of Python for array manipulation (K4)

CO4: Incorporate methods of Pandas library for statistical manipulations and to implement statistical functions (K4)

CO5: Implement Data visualization using matplotlib of python (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
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**
Grand total of COs with PSOs and POs														**133**
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs/Number of COs relating with PSOs and POs=(133/50)														**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	COs of this course is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
PROGRAMMING SMART DEVICES

Class	: MCA	Part	: Core –10
Semester	: III	Hours	: 60
Subject Code	:	Credits	: 4

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: **(12 HOURS)**
Introduction to React Native-Advantages of React Native-Risk and Draw Backs-Working with React Native-Rendering life cycle-Creating Components in React Native-Working with views-JSX-Styling Native Components-Building your first Application-Setting up-Installing-ios Dependencies-Android Dependencies-Creating new Application-Running react native on ios-Running React Native on Android.

UNIT II: **(12 HOURS)**
Imports in React Native-Project Components-Building Weather app-Handling user Input-Displaying Data-Adding background Image-Fetching Data from the Web-Components for mobile-Analogy between HTML elements and Native components-Text Components-Image Component-Using Touchable Highlight-React Pan Responder-Working with Organizational Components-Navigators.

UNIT III : **(12 HOURS)**
Styles-Declaring and Manipulating styles-Inline Style-Styling with Objects-style Concatenation-Exploring style object-Passing Styles as Prop-Reusing and Sharing Styles-Positioning and Designing Layouts-Layouts with Flexbox-Platform API-Geolocation-Handling Permission-Accessing User Image and Camera-Uploading Image to server.

UNIT IV: **(12 HOURS)**
Debugging-Debugging with Console.log-Using Java script Debugger-Working with the react developer tools-React Native Debugging Tools-Common Xcode Problems-Common Android Problems-issues deploying to an ios device.

748

UNIT V: **(12 HOURS)**

Deploying to ios App Store-Preparing xcode project-selecting and target ios version-Launch Screen Images-Adding Application icon-Deploying Android application-Launch icon setting-Building the API for release-Beta Testing-Submitting app to play store.

Book for Study

1. Bonnie Eisenmen, "Learning React Native- Building Native Mobile App with Java Script", 2016, First Edition, O' Reilly Media Inc.

Web Sites for Reference

1.https://reactnative.dev/docs/getting-started

2. https://www.netguru.com/glossary/react-native

3. https://www.youtube.com/watch?v=ANdSdIlgsEw

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 React Native Applications(K2)

CO2: Apply knowledge to create project.(K3)

CO3: Create Component Elements.(K6)

CO4: Analyze debugging of react Native application (42)

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
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
Grand total of COs with PSOs and POs														135
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)														2.7

Strong – 3, Medium -2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to 2.0	2.01to 3.0
Quality	Low	Medium	Strong
Mean Value of Cos with PSOs and POs			2.7
Observation	Cos of Mobile Application Development–Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
DATA MINING AND DATA WAREHOUSING

Class   : MCA   Part   : III Core 11
Semester   : III   Hours : 60
Subject Code :   Credits : 4

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 CLASSIFICATIONAND 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

3. Data Mining: https://onlinecourses.nptel.ac.in/noc20_cs12/preview

4. Introduction to Data Mining and OLAP: https://www.youtube.com/watch?v=m-aKj5ovDfg

5. ClusterAnalysis: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
CO1	3	2	-	-	2	3	2	1	3	2	3	1	3	25
CO2	3	2	-	-	2	2	1	2	3	3	2	2	3	25
CO3	3	2	-	-	2	3	1	1	3	3	2	2	3	25
CO4	3	2	-	-	1	2	2	-	2	3	2	1	2	20
CO5	3	2	-	-	2	3	2	1	3	2	3	1	3	25
Grand total of COs with PSOs and POs														120
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)														2.22

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			2.22
Observation	COs of Data Mining and Data Warehousing – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

MACHINE LEARNING

Class   : MCA   Part   : III Core-12
Semester   : III   Hours : 60
Subject Code :   Credit : 4

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   (12 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   (12 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.

Unit – 3 ANN   (12 HOURS)

Perceptions - Back propagation Algorithms. Evaluating Hypothesis: Deriving confidence intervals - Hypothesis testing - comparing learning algorithms.

Unit – 4 BAYESIAN LEARNING   (12 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   (12 HOURS)

Analytical learning - Explanation based learning - Inductive Analytical approaches to learning - Using prior knowledge to, initialize the hypothesis, alter the search objective and augment search operators.

 Book 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, Seond Edition, 2010,MIT Press.
2. MarslandStephan, 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
Grand total of COs with PSOs and POs														98
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)														1.96

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
DATA ANALYSIS WITH PYTHON LAB

Class   : MCA   Part   : Core Lab-5
Semester   : III   Hours : 75
Subject Code :   Credit : 3

Objectives:
The course enables the students to
- Explore knowledge on collection data types in python
- Practice standard libraries and in-built methods for array processing
- Implement data analysis process by using numerical library of python
- Implement statistical distributions and functions with pandas libraries
- Develop simple tool for the implementation of regression based machine learning algorithms

Program List
1. Implement data analysis process using collection data types
2. Create an user interface for a typical data form using GUI containers and widgets
3. Implement statistical functions by using pre-processed database objects.
4. Implement various array manipulation methods using NumPy of Python
5. Implement probability distribution functions using NumPy of Python
6. Implement vectorization by using universal functions of NumPy of Python
7. Implement Data cleaning process for a given dataset. Consider all possible cases to fix bad data of the given dataset
8. Create a database and generate scatter plot for the pre-processed table of data using pandas of Python
9. Create a database and generate histogram for stored dataset using pandas of python
10. By using database, generate decision tree by using pandas of Python
11. Create a database and generate line graph plot by using PlotPy of matplotlib
12. Create a database and generate bar graph by using PloyPy of matplotlib
13. Create a database and generate Pie graph by using PloyPy of matplotlib
14. Implement linear regression for a given datasets. Use database as data source
15. By using database, implement polynomial regression by using matplotlib
16. By using database, implement unsupervised learning method by using matplotlib

Course Outcomes

On the successful completion of the course the students will able to

CO1: Understand collection data types and their methods (K2)

CO2: Explore standard libraries and in-built functions to handle arrays (K3)

CO3: Apply numerical in-built libraries for implementing data analysis process (K4)

CO4: Incorporate pandas library for implementing statistical functions and distributions(K4)

CO5: Develop simple tool for regression analysis (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
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
Grand total of COs with PSOs and POs														133
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs/Number of COs relating with PSOs and POs=(133/50)														2.66

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			2.66
Observation	COs of this course is strongly related with PSOs and POs		

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ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS
MOBILEAPPLICATIONDEVELOPMENT –LAB

Class	:MCA	Part	:CoreLab-6
Semester	:IV	Hours	:75
Subject Code	:20PCAP64	Credit	:3

Objectives:

The course enables the students to

- ☐ Understand the IDE for mobile emulators and devices
- ☐ Understand variables, class and string in typescript
- ☐ Understand the concepts of Angular JSComponents and Templates
- ☐ Develop program using Ionic features
- ☐ Design and Develop test based mobile applications

1. Environment Setup
   - Node, Git
   - Apache Cordova CLI
   - Ionic CLI
   - Platform Toolsi OS, Android, Windows
   - Setting Emulators
   - Setting up the Device
   - Preview on Emulator and Device
2. Typescript(Typescript&Es6)
   - Variables, Classes
   - Promises
   - Observables
   - Template Strings
   - Arrow functions
   - Types
3. Angular
   - Components
   - Inputs
   - Templates
   - Events
   - Pipes
   - @View Child
4. Apache Cordova Configuring the Cordova App
   - Device Access(Plugins)
5. Ionic
   - Ionic Components
6. Ionic2DoApp
7. Debugging, Testing & Deploying

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 variables, class and string in Programming.(K3)

CO3: Create programs using angular JSComponents and Templates.(K6)

CO4: Apply Ionic programming concepts in developing mobile App.(K3)

CO5: Develop test based mobile applications.(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	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
Grand total of COs with PSOs and POs														130
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)														2.6

 Strong–3,Medium -2,Low-1

Mapping Scale	1	2	3
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
CLOUD COMPUTING

Class   : MCA   Part   : Core Elective - III
Semester   : III   Hours : 60
Subject Code   :   Credit : 3

Objectives:
The course enables the students to
- Understand the cloud basic concepts and architecture
- Familiarize varies tools and mechanism of virtualization
- Understand the process of cloud storage and resource management
- Compare various cloud programming paradigms
- Analyze the concepts of cloud security

UNIT I   CLOUD ARCHITECTURE AND MODEL   12 HOURS

Technologies for Network Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture – Characteristics – Cloud Services. **Cloud Models** (IaaS, PaaS, SaaS) – Public vs Private Cloud – Cloud Solutions - Cloud ecosystem – Service management – Computing on demand.

UNIT II   VIRTUALIZATION   12 HOURS

Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource Management – Virtualization for Data-Center Automation.

UNIT III   CLOUD INFRASTRUCTURE   12 HOURS

Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – Design Challenges - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

UNIT IV   PROGRAMMING MODEL   12 HOURS

Parallel and Distributed Programming Paradigms – MapReduce, Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim.

UNIT V   SECURITY IN THE CLOUD   12 HOURS

Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

Books for Study
1. Kai Hwang, Geoffrey. C Fox, Jack Dongarra, Distributed and Cloud Computing, From Parallel Processing to the Internet of Things, 2013, Morgan Kaufmann Publishers.

2. John W. Rittinghouse, James F. Ransome, Cloud Computing: Implementation, Management, and Security, 2009, CRC Press.

Books for Reference
1. Buyya Rajkumar, Vecchiola Christian, S Thamarai Selvi , Mastering Cloud Computing, 2013, Tata McGraw-Hill Education.
2. VelteToby, Velte, ElsenpeterRobert, Cloud Computing, A Practical Approach, 2009, Tata McGraw-Hill Professional.
3. SaurabhKumar, Cloud Computing – Insights into New-Era Infrastructure, Wiley India, 2011.
4. Reese George, Cloud Application Architectures: Building Applications and Infrastructure in the Cloud, 2009, O'Reilly Media, Inc.

Web References
1. https://nptel.ac.in/courses/106105167
2. https://nptel.ac.in/courses/106105223

Teaching Methods
- ➢ Lecturing
- ➢ Group Discussions
- ➢ PPTs
- ➢ Quiz Program
- ➢ Video Tutorials

Course Outcomes

On the successful completion of the course students will be able to:

CO1: Understand the cloud architecture. (K2)
CO2: Apply the concept of virtualization. (K3)
CO3: Analyze the usage of cloud resources. (K4)
CO4: Evaluate different types of programming paradigms. (K5)
CO5: Analyse the cloud security issues. (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	PS O 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	3	1	1	2	-	-	3	3	-	3	3	25
CO2	3	3	3	2	2	3	-	-	3	3	-	3	3	28
CO3	3	3	3	2	1	3	-	-	3	3	-	3	3	27
CO4	3	3	3	2	2	3	-	-	3	3	-	3	3	28
CO5	3	3	3	3	2	3	-	-	3	3	-	3	3	29

Grand total of COs with PSOs and POs	137
Mean value of COs with PSO and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}}$ = (137/50)	**2.74**

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			2.74
Observation	COs of Cloud Computing – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)- KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
INTERNET OF THINGS

Class : MCA   Part : Core Elective III
Semester : IV   Hours: 60
Subject Code :   Credit: 3

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   (12 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   (12 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: (12 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: (12 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 – 5 CASE STUDIES ILLUSTRATING IOT DESIGN   (12 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. Waher Peter, Learning Internet of Things, 2015, PACKT Publishing-Birmingham-Mumbai.

Books for Reference:
1. Bahga Arhdee, Madisetti Vijay, Internet of Things: A Hands on Approach (http://www.internet-of-things-book.com/). 2015.
2. Pfister Cuno, 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
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
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
Grand total of COs with PSOs and POs														110
Mean Value of COs with PSOs and POs =Grand total of COs with PSOs and POs/Number of COs relating with PSOs and POs =(110/45)														2.44

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 Internet of Things – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS),KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
DOT NET PROGRAMMING

Class   : MCA   Part   : III Core-13

Semester   : IV   Hours : 60

Subject Code :   Credit : 04

Objectives:

The course enables the students to

- Understand Framework Architecture and Components
- Understand the fundamentals of programming such as conditional and iterative execution, classes & methods.
- Understand the ASP.NET web Controls and Web Applications.
- Understand State and Session management.
- UnderstandtheADO.NET

UNIT I   **(12 HOURS)**

Introduction to .Net Technologies: Introduction to Internet and Web Technologies – HTML Basics – Script – Client side Vs Server side scripts – Advantages and Disadvantages of Client side Vs Server side scripts – History of .Net Platform - .Net Framework Components overview.

UNIT II   **(12 HOURS)**

Dot Net Building Blocks : Introduction to C# – Integrated Development Environment – Basic Keywords – Data Types – Statements – Conditionals – If Else – Select Case – Switch and Choose – Loops – Do – For Next – while – Window forms – Working with Controls – MDI – functions – OOPs .

UNIT III   **(12 HOURS)**

Introduction to ASP.Net and ASP.Net controls: Introduction to ASP.Net – Advantages of ASP.Net - ASP.Net Architecture - ASP.Net Page's structure – Sample program in ASP.Net – Page Events – HTML Server Controls – Web User Controls in ASP.Net.

UNIT IV   **(12 HOURS)**

Objects and Advanced Concepts in ASP.Net: Request Object – Response Object – Code Behind Feature of ASP.Net – Caching in ASP.Net – Output Caching – Fragment Caching – Data Caching – Session / State Management – Events – Error Handling and Debugging – Tracing an Application.

UNIT V   **(12 HOURS)**

ADO.Net for .Net Application: Introduction to ADO.Net – ADO Vs ADO.Net – Connected ADO.Net Architecture – Disconnected ADO.Net Architecture – Data Adapter - ADO.Net Classes - ADO.Net Namespaces – Interfacing VB.Net Applications with ADO.Net – Interfacing ASP.Net Application with ADO.Net-Crystal Report.

Text Books

1. Alex, "Professional ASP.Net 1.1", Homler and Group Wrox Publications.

2. David Sceppa, "Microsoft ADO.NET (Core Reference), Microsoft Press, 2006, 2nd Edition

3. Joe Duffy, "Professional .Net Framework 2.0", 2006 Edition, Wrox Publications.

4. Steven Holzner, "Visual Basic .NET Programming - Black Book", 2005 Edition, Dreamtech Press.

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1. Muthu C," Visual Basic .Net", , 2007, Tata MaGraw-Hill Publication.

2. Nitini Pandey, Yesh Singhal, Mridula parihar," Visual Studio.Net Programming", 2002, Wiley-DreamTech India (p) Ltd.

3. Nikhil Kothari, Vandana Datye "Developing Microsoft ASP.NET Server Control and Componentsw", 2003, Tata MaGraw-Hill Publication.

4. Balagurusamy E, "Programming in C#", 2002, Tata MaGraw-Hill Publication.

Web References

1. https://learn.microsoft.com/en-us/training/paths/build-dotnet-applications-csharp/

2. https://www.udemy.com/course/high-performance-coding-with-net-core-and-csharp/

3. https://www.geeksforgeeks.org/top-50-asp-net-interview-questions-and-answers/

TeachingMethods

- ➢ Lecturing
- ➢ Group Discussions
- ➢ PPTs
- ➢ Learning byDoing
- ➢ Videotutorials

Course Outcomes:

OnSuccessfulcompletionofthecoursethestudentsableto

CO1: Understand the basic concepts to solve standalone applications (K2)
CO2:Applycontrolstatementsandmethodsforcomplex programs (K3)
CO3:Designanddevelop Web applications usingASP.NET Web controls(K6)
CO4: Abilitytodeveloppresponsive and dynamic web applications.(K6)
CO5 : Apply ADO.NET to client and server applications. (K4)
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
CO1	3	3	-	-	2	1	1	-	1	1	2	1	1	16
CO2	3	2	-	-	2	2	1	-	2	2	2	1	1	18
CO3	3	3	-	-	2	3	1	-	3	3	2	2	2	24
CO4	3	3	-	-	2	2	1	-	3	2	2	2	1	21
CO5	3	3	-	-	2	2	1	-	3	3	3	2	2	24

Grand total of COs with PSOs and POs	103
MeanValue of COs with PSOs and POs=Grand total of COs with PSOs and POs/Number of COs relating with PSOs and POs=(103/50)	**2.06**

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
MeanValue of Cos With PSOs and POs			2.06
Observation	COs of Dot Net Programming is Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
SOFTWARE ENGINEERING

Class	: MCA	Part : Core-14
Semester	: IV	Hours : 60
Subject Code	:	Credit : 4

Objectives:
The course enables the students to
- Understand the basic software engineering design concepts and models.
- Analyze varies 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: **(12 HOURS)**
Generic View of Process – Process Models - The Waterfall Model - Incremental Model - Evolutionary Model - The Unified Process–Agile Process – Agile Models – Software Cost Estimation – Planning – Risk Analysis – Software Project Scheduling.

UNIT II: **(12 HOURS)**
System Engineering Hierarchy – System Modeling – Requirements Engineering Tasks-Initiating the Process - Eliciting Requirements - Negotiating Requirements - Validating Requirements – Building the Analysis Models.

UNIT III: **(12 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.

UNIT IV: **(12 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.

UNIT V: **(12 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. PressmanRoger,Software Engineering: A Practitioner's Approach, Seventh Edition, Tata McGraw Hill, 2017

Books for Reference
1. PfleegerLawrenceShari, Software Engineering: Theory and Practice, ,2003, Prentice Hall.

2. GhezziCarlo, JazayariMehdi, MandrioliDino, Fundamentals of Software Engineering, 2003, Prentice Hall of India.

3. SommervilleIan, Software Engineering,Tenth Edition,2017, Pearson Publications.

Web reference

1. Software quality factors:
   https://www.tutorialspoint.com/software_quality_management/software_quality_management_factors.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. Design Techniques:
   https://www.tutorialspoint.com/software_engineering/software_design_strategies.htm

5. Verification & validation: https://www.javatpoint.com/verification-and-validation-testing

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
PROJECT WORK/INTERNSHIP

Class	: MCA	Part	: III Core - 15
Semester	: IV	Hours	: 45
Subject Code	:	Credit	: 3

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

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

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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
Grand total of COs with PSOs and Pos														132
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)														2.4

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
MeanValue 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
DOT NET PROGRAMMING LAB

Class   : MCA   Part   : III Core Lab7
Semester   : IV   Hours : 75
Subject Code   :   Credit : 2

Objectives:
The course enables the students to

- Understand basicsofVB.NET windows application and its execution.
- Develop applications on console applications that implements OOPs.
- Develop programs on Window Based Components.
- Develop Dynamic application using ADO.NET.
- Develop applications on session Management.

List of Exercises

Windows Application
1. Biggest and Smallest Using Event Procedure
2. Simple and Compound Interest Using Even Procedure
3. Money Conversion
4. Arithmetic Calculator Using Event Procedure
5. Pre-Defined and User-Defined Date And Time Formats
6. Swapping List Box Items
7. Demo the Dialog Boxes
8. Menu Editor
9. Context Menu

Console Applications
10. Sum of N Natural , Square and Cube Numbers
11. Math And String Function
12. Call By Value and Call By Reference
13. Net Salary Calculation
14. Sorting the Numbers

ADO .Net
15. Load the Field Values in the List Box
16. Employee Data Manipulation

17. Simple Data Binding
18. Complex Data Binding
19. Load the Tables In the Data Grid
20. Stored Procedure
21. Crystal Report

ASP.NET

22. Registration Form Using Validation Controls
23. Login form Validation
24. Master Page Creation
25. Session and state Management

Outcomes:

On successful completion o the course the students able to

CO1: Apply Windows components on applications.(K3)

CO2: Understand and Apply Object oriented features and .NET Console
applications.(K3)

CO3: Apply the concept of ADO.NET Database connectivity (K3)

CO4: Generate Crystal report on windows form control.(K3)

CO5: Develop applications on session management and cookies.(k6)

K1=Remember   **K2**=Understand   **K3**=Apply   **K4**=Analysis   **K5**=Evaluate   **K6**=Create

Mapping

	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	-	-	1	1	1	-	21
	Grand Total of Cos with POs PSOs													109
	Mean Value of COs with PSOs and POs= Grand total of COs with PSOs and POs/Number of COs relating with PSOs and POs=(109/50)													2.18

Strong–3,Medium–2,Low – 1

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Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
MeanValue of COs With PSOs and POs			2.18
Observation	COs of dot net programming lab is Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
(Those who are joined for BCA Programme from 2023-2024 onwards)

Semester I			
Part	List of Courses	Credit	Hours per week (L/T/P)
Part-I	Language	3	6
Part-II	English	3	4
Part-III	CC1- Programming in C CC2-Programming in C -LAB	4+4	5+5

	Elective 1- Digital Computer Fundamentals
	        Internet Fundamentals
	        Office Automation
		3	4

Part-IV	Skill Enhancement Course SEC-1 (Non Major Elective) Computer Fundamentals	2	2
	Foundation Course FC	2	2
	Ability Enhancement Compulsory Course (AECC 1) Soft Skill-1	2	2
		23	30
Semester II			
Part	List of Courses	Credit	Hours per week (L/T/P)
Part-I	Language	3	6
Part-II	English	3	4
Part-III	CC3-Object Oriented Programming CC4-Data Structure using C++ Lab	4+4	5+5
	Elective-2 Data Structures Computer Organization Discrete Mathematics	3	4
Part-IV	Skill Enhancement Course SEC-2 (Non Major Elective) Web Design	2	2
	Skill Enhancement Course SEC-3 (Discipline Specific / Generic) Web Design	2	2
	Ability Enhancement Compulsory Course (AECC 2) Soft Skill-2	2	2
		23	30

Semester III			
Part	**List of Courses**	**Credit**	**Hours per week (L/T/P)**
Part-I	Language	3	6
Part-II	English	3	4
Part-III	Core Courses 2 (CC5, CC6) CC5- Programming in JAVA CC6- Programming in JAVA LAB	4+4	5+5
	Elective Course 1 (Generic / Discipline Specific) **EC3** Computer Networks Basics of Information Technology Digital Marketing	3	4
Part-IV	Skill Enhancement Course SEC-4 (Entrepreneurial Based) ICT Tools	1	1
	Skill Enhancement Course SEC-5 (Discipline Specific / Generic) Quantitative Aptitude	2	2
	Ability Enhancement Compulsory Course (AECC 3) Soft Skill-3	2	2
	Environmental Studies (EVS)	1	1
		23	**30**
Semester IV			
Part	**List of Courses**	**Credit**	**Hours per week (L/T/P)**
Part-I	Language	3	6
Part-II	English	3	4
Part-III	Core Courses 2 (CC7, CC8)	4+2+2	4+3+2
	CC7 : Core Industry Module – I – Industrial Statistics CC7- Web Programming		
	CC8 : Any Core Paper CC8-Web Programming Lab		
	Elective Course 1 (Generic / Discipline Specific)		

	EC4 Multimedia Open Source Technology- linux Professional Ethics		
Part-IV	Skill Enhancement Course – SEC 7 Animation using Flash	2	2
	Skill Enhancement Course – SEC 8 (Discipline Specific / Generic) Basics of Cyber Security	2	2
	Ability Enhancement Compulsory Course (AECC 4) Soft Skill-4	2	2
	Environmental Studies EVS	1	1
		24	**30**

Semester V			
Part	**List of Courses**	**Credit**	**Hours per week (L/T/P)**
Part-III	Core Courses 3 (CC9, CC10, CC11) Mobile Application Development Mobile Application Development –LAB Operating System	4+4+4	5+5+5
	Elective Courses 2 (Generic / Discipline Specific) **EC5** Mobile Computing Artificial Intelligence Natural Language Processing **EC6** Software Engineering Software Project Management Big Data tools and Techniques	3+3	5+5
Part-IV	Professional Competency Skill Enhancement Course SE8 Data Analysis using Spread sheet	2	4
	Value Education	1	1
Part-V	Internship / Industrial Training (Carried out in II year summer vacation) (30 hours)	2	-
		25	**30**

Semester VI			
Part	**List of Courses**	**Credit**	**Hours per week (L/T/P)**
Part-III	Core Courses 3 (CC12, CC13, CC14) Python Programming Python Programming Lab Data Mining and Ware housing	4+4+4	5+5+5
	Elective Courses 2 (Generic / Discipline Specific) **EC7** Operations Research Computer Graphics Web Graphics **EC8** Introduction to Image Processing Introduction to Cyber Security Cloud Computing	3+3	5+5
Part-IV	Professional Competency Skill Enhancement Course SE8 Introduction to Data Science	2	4
	Value Education	1	1
Part-V	Extension Activity (Outside college hours)	1	-
		22	**30**

Total Credits : 140

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
Programming in C

Class	**: BCA**	**PartIII:CC1**
Semester	**: I**	**Hours: 75**
Subject Code	**:**	**Credits :4**

Objectives:

The course enables the students to

- Write the programs for a given problem by using operators and basic statements.
- Demonstrate to use decision making and looping statements to solve the problems.
- Exercise user defined functions to solve real-time problems.
- Integrate pointers, static memory allocations and dynamic memory management functions.
- Implementing file operations in C programming for data base programs.

UNIT-I   **15 Hours**

Overview of C-Introduction –Character set –C tokens-key words& Identifiers -Constants - Variables - Data types - Declaration of variables - Defining Symbolic Constants - Operators - Arithmetic Expressions - Evaluation of expressions - Type conversion in expressions – operator precedence &associatively - Mathematical functions – Formatted/Unformatted input and output statement.

UNIT-II   **15 Hours**

Decision Making and Branching: Conditional and Control statements- One- and Two-Dimensional Array - Multidimensional arrays - Declaring and initializing string variables – Writing strings to Screen-Arithmetic operations on Character –String handling Functions.

UNIT-III   **15 Hours**

Functions: Definition of functions - Return values and their types - Function declaration &call - Category of functions- No Arguments and no return values- Arguments but no return values - Arguments with return values - No Arguments but Returns a value- Functions that return multiple values-Nesting of functions-Recursion.

UNIT-IV   **15 Hours**

Structure: Definition - Structure initialization - Copying & Comparing structure variables -Operations on individual members - Arrays of structures - Arrays within structures – Structures within structures - Structures and functions - unions - size of structures - Bit fields. Pointers -Understanding pointers - Accessing the Address of variable - Declaring and initializing pointers –accessing a variable through its pointers –Chain of pointers- pointer expressions.

UNIT-V   **15 Hours**

File management in C-Defining and opening a file-closing a file-I/O operations on files - Error handling during I/O operations - Random access to files - Command line arguments –preprocessor.

Book for Study

1.Balagurusamy.E, *Programmingin ANSIC*, Tata McGraw Hill, Fifth Edition, 2011.

Books for Reference

1. Kamthane. N Ashok, *Programming with ANSI and Turbo C*, Pearson Edition Publication, 2002.

2. MullishHenry.L.CooperLHubert,The Spirit of C, Jai co Publication House,1996.

Teaching Methods

➢ Lecturing
➢ Group Discussion
➢ Learning by Doing
➢ Video tutorials

Course Outcomes:

On successful completion of the course students will be able to

CO1: Apply the basic concepts of OOPs for writing the programs for a given problem (K3)

CO2: Understand decision making and looping statements to solve a problem.(K2)

CO3: Apply user defined functions to solve real-time problems.(K3)

CO4: Integrate pointers, static memory allocations and dynamic memory management functions.(K3)

CO5: Implementing file operations in C programming fordata base programs.(K5)

  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 ofCOs withPSOs& 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
GrandTotalof COswithPOsPSOs														110
Meanvalueof COswithPSOsand POs= $\dfrac{\text{GrandtotalwithPSOsandPOs}}{\text{NumberofCOsrelatingwithPSOs\&POs}}$ =(110/50)														**2.20**

Strong–3,Medium–2,Low – 1

MappingScale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
MeanValueofCOs withPSOsandPOs			2.20
Observation	COsofProgramminginC–StronglyrelatedwithPSOsandPOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS
Programmingin C– Lab

Class : BCA	**PartIII:CC2**
Semester :I	**Hours:75**
Subject Code:	**Credits:4**

Objectives:

- Understand and trace the execution of programs written in C language.
- Develop C code for a given algorithm.
- Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
- Develop programs that perform operations using derived data types.
- Write diversified solutions to real-time problems using C language.

Lab Exercises

1. Program to check the prime number
2. Program to print Fibonacciseries
3. Program to print factorial value
4. Program using Decision Control Structures
5. Program using Looping Control Structures
6. Program to reverse the given number
7. Program to find biggest of three numbers
8. Program for swapping of two numbers
9. Program using String Functions
10. Program using Arrays
11. Program using Functions
12. Program using Pointers
13. Program usingS tructure
14. Program using Union
15. Program using file concepts
16. Write a program to open a file
17. Write a program to close a file

Teaching Methods

- ➢ Learning by Doing
- ➢ Demonstration

Course Outcome(CO)

On successful completion of the course students will be able to

CO1: Understand and trace the execution of programs written in C language.(K1)
CO2: Write the C code for a given algorithm.(K3)
CO3: Apply arrays and perform pointer arithmetic, and use the pre- processor.
(K3)**CO4:** Develop programs that perform operations using derived data types.
(K3)**CO5:**Write diversified solutions to real-time problems using C language.(K6)
  K1=Remember**K2=**Understand**K3=**Apply**K4=**Analysis**K5=**Evaluate**K6=**Create**Ma
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 ofCOs withPSO s& POs
CO1	3	2	1	2	1	3	3	-	-	1	1	1	-	20
CO2	3	2	2	2	1	3	2	-	-	2	2	2	-	21
CO3	3	2	2	1	1	3	2	-	-	2	3	2	-	22
CO4	3	2	2	1	2	3	2	-	-	2	3	2	-	23
CO5	3	2	2	1	2	3	3	-	-	2	2	3	-	25
														11
	GrandtotalwithPSOsandPOs													2.22

  Strong–3,Medium–2,Low – 1

MappingScale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
MeanValueofCOs withPSOsandPOs			2.22
Observation	COsofProgramminginCLab–Stronglyrelatedwith PSOsandPOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
Digital Computer Fundamentals

Class :BCA	**Part III : Elective 1**
Semester :I	**Hours : 60**
Subject Code :	**Credit : 03**

Objectives:
The course enables the students to
- Write a digital logic and apply it to solve real life problems.
- Understand the basic concepts combination allogic circuits.
- Identify the concept of multiplexers.
- Identifythebasicworkingprinciplesofflip-flopswithdifferentarchitecture.
- Understand the basics of memory.

UNIT–I   12 Hours
Number Systems and Codes: Number System – Base Conversion – Binary Codes – Code Conversion.
Digita lLogic: Logic Gates– Truth Tables– Universal Gates.

UNIT–II   12 Hours
Boolean algebra: Laws and Theorems – SOP, POS Methods – Simplification of Boolean Functions –
Using Theorems,K-Map, Binary Arithmetic: Binary Addition–Subtraction – Arithmetic Building
Blocks – Adder –Subtractor.

UNIT–III   12 Hours
Combinational Logic: Multiplexers – Demultiplexers – Decoders – Encoders

UNIT–IV   12 Hours
Sequential Logic: RS, JK, D, and T Flip-Flops – Master-Slave Flip-Flops. Registers: Shift Registers –
Types of Shift Registers.

UNIT–V   12 Hours
 Memory: Basic TermsandIdeas-Heirarchy –Types of ROMs– Types of RAMs.

Books for Study
   1. V.Rajaraman and T. Radhakrishnan, Digital Computer Design,Prentice Hall of India,2001.

Books fo rReference
   1. Mano Morris.M,*Digital Logic and Computer Design*, PHI,2 017.
   2. T.C.Bartee, Digital Computer Fundamentals,6th Edition, Tata McGraw Hill, 1991.

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: Analyze digital logic and apply it to solve real life problems.(K4)

CO2: Apply combination allogic circuits for a required circuit (K3)

CO3: Understand the concept of ALU and Data processing model in various processors.(K2)

CO4: Identify the basic working principles of flip-flops with different architecture.

(K2)**CO5:**Analyze types of memories (K4)

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	3	3	2	2	1	3	3	-	-	2	1	1	-	21
CO2	2	2	2	2	1	3	2	-	-	2	2	2	-	20
CO3	3	3	2	2	2	3	3	-	-	2	3	3	-	26
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														111
MeanvalueofCOswithPSO andPOs= $\dfrac{\textbf{GrandtotalwithPSOsandPOs}}{\textbf{NumberofCOsrelatingwithPSOs\&POs}}$ **=(111/50)**														**2.22**

 Strong–3,Medium–2,Low – 1

MappingScale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
MeanValueofCOs withPSOsandPOs			2.22
Observation	COsofDigitalPrinciples–StronglyrelatedwithPSOsandPOs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR –615514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
Internet Fundamentals

Class : BCA	**Part III: Elective-1**
Semester :I	**Hours: 60**
Subject Code:	**Credits: 03**

Objectives:
- Impart knowledge on Internet
- Discuss about World Wide Web
- Guide them to make use of Internet platform
- Inculcate knowledge on web servers
- Illustrate privacy and Security topics.

UNIT-I   **12 Hours**
THE INTERNET
Introduction to networks and internet, history, Internet, Intranet & Extranet, Working of Internet, Internet Congestion, internet culture, business culture on the internet. Collaborative computing & the internet. Modes of Connecting to Internet, Internet Service Providers(ISPs), Internet address, standard address, domain name, DNS, IP.v6.Modems, Speed and time continuum, communications software; internet tools.

UNIT-II   **12 Hours**
WORLDWIDE WEB
Introduction, Miscellaneous Web Browser details, searching the www: Directories search engines and metasearch engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP, HTTP, Gopher Commands, TCP/IP. Introduction to Browser, Coast-to-coast surfing, hypertext markup language, Web page installation, Web page setup, Basics of HTML & formatting, and hyperlink creation.Using FrontPage Express, Plug-ins.

UNIT-III   **12 Hours**
INTERNET PLATFORM AND MAILING SYSTEMS
Introduction, advantages and disadvantages, User Ids, Passwords, e-mail addresses, message components, message composition, mailer features, E-mail inner workings, E-mail management, MIME types, Newsgroups, mailing lists, chat rooms, secure-mails, SMTP, PICO, Pine, Library cards catalog, online ref. works.
Languages: Basic and advanced HTML, Basics of scripting languages – XML, DHTML, JavaScript.

UNIT-IV   **12 Hours**
SERVERS
Introduction to Web Servers: PWS, IIS, Apache; Microsoft Personal Web Server. Accessing & using these servers.

UNIT –V   **12 Hours**
Privacy and security topics: Introduction, Software Complexity, Attacks, security and privacy levels, security policy, accessibility and risk analysis, Encryption schemes, Secure Web document, Digital Signatures, Firewalls, Intrusion detection systems

Book for Study

1. Internet & World Wide Programming, Deitel, Deitel& Nieto, 2012, Pearson Education

Book for Reference

1. Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp, TMH-2012

Teaching Methods

- ➢ Lecturing
- ➢ Group Discussion
- ➢ Learning by Doing
- ➢ Video tutorials

Course Outcomes:

On successful completion of the course students will be able to

CO1: Understand the basic concepts of Internet (K2)

CO2: Understand the concept of World Wide Web (K2)

CO3: Apply knowledge on internet platforms(K3)

CO4: Analyze the different types of servers (K4)

CO5: Implementing security techniques on internet(K3)

  K1=Remember**K2=**Understand**K3=**Apply**K4=**Analysis**K5=**Evaluate**K6=**Create

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS
Office Automation

Class **: BCA**	**Part III : Elective-1**
Semester **:I**	**Hours : 60**
Subject Code:	**Credits:03**

Objectives:
- Impart knowledge on word processing
- Discuss about various menus in MS Word
- Guide the min preparing presentation
- Inculcate the ways of preparing MS Excel
- Illustrate database Concepts

UNIT-I   **12 Hours**
Introduction to Microsoft Office-Word Processing&Microsoft Word-Introduction to Word Processing-Some Important Terms of Word Processing-Starting Word-Microsoft Word Screen-File Menu-Edit Menu-View Menu-Insert Menu-Format Menu.

UNIT-II   **12 Hours**
Tools Menu-Table Menu-Window Menu-Help Menu-Formatting the Text-Alignment of Text-Applying Fonts-Size of Text-Font of the Text-Color of the Text.

UNIT-III   **12 Hours**
Spreadsheets & Microsoft Excel:Understanding Microsoft Excel for Windows-Starting Microsoft Excel 2000-Understanding Spreadsheets-File Menu-Edit Menu-View Menu-Insert Menu-Format Menu-Tools Menu-Data Menu-Window Menu-Help Menu.

UNIT-IV   **12 Hours**
Creating a Worksheet in Excel for Windows-Copying Formula-FormulasThatMakeDecisions-Styles-FunctionsinExcel-UsingAutosum-Usingautocalculate-References-Sum Function-Average Function-Creating Charts in Excel-Creating Graphs-Modifying Chart-Adding Data to Chart-Add a Data table to a Chart-Add a Trendline-Creating a Pivot Table Report-Modifying the Chart Type.

UNIT-V   **12 Hours**
Introduction to access-Tables-Simple Queries-Form.

Book for Study
    1.Vikas Gupta ITToolsandApplications-DreamtechPress-Firstedition-2003.

Books for Reference
    1. Archana Kumar, Computer Basics with Office automation, I K International Publishing House, 2013

Teaching Methods
- ➢ Lecturing
- ➢ Group Discussion
- ➢ Learning by Doing
- ➢ Video tutorials

Course Outcomes:

Onsuccessfulcompletionofthecoursestudentswillbeableto

CO1: Apply knowledge on document preparation (K3)

CO2: Understand various options in menus (K2)

CO3: Develop powerpoint presentations(K3)

CO4: Apply excel functions and formulas in spread sheet(K3)

CO5: Develop database for different applications(K5)

K1=Remember**K2=**Understand**K3=**Apply**K4=**Analysis**K5=**Evaluate**K6=**Create

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS
Computer Fundamentals

Class : BCA	**Part III: SEC-1**
Semester :I	**Hours :30**
Subject Code :	**Credits: 02**

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 trouble shooting techniques to overcome the problems faced in it
- Understand maintenance techniques and tools

UNIT-I   **(6Hours)**

CPU: Layout of a typical desktop – Types of computer – Generation of computer.

UNIT-II   **(6 Hours)**

InputDevices:Keyboard–Construction–Interfaces.Mouse:Construction–Mechanicalandoptical-Mechanicalsensors–Trackball.Motherboard:structureofmotherboard–Typesofmotherboard.

UNIT-III   **(6 Hours)**

Printers: Dot matrix printers – Ink jet printers – Laser/LED printers.

UNIT-IV   **(6 Hours)**

Types of monitor –CRT – Laser –LCD- LED .

UNIT-V   **(6 Hours)**

 PC Maintenance: CreatingBackup–CreatingSystemRecovery–RemovingunusedFileandPrograms.

Books for Study:

1.   StephenJ. Bieglow,*Troubleshooting, Maintaining and repairing PCs*,TataMc–Graw5 Edition,2013.

Books for Reference:

1. Craig Zacker& John Rourke, *PC Hardware: The completereference*,Tata Mc-Grawhill,1 Edition 2012.
2. Govindarajulu.B, *IBMP Candclones:Troubleshooting and maintenance*,TataMc-Graw Hill,2 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 mother board 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, sound cards 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 ofCOs withPS Os& 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
	GrandTotalof COswithPosPSOs													104
	GrandtotalwithPSOsandPOs													

  Strong–3,Medium–2,Low – 1

MappingScale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
MeanValueofCOs withPSOsandPOs			2.08
Observation	COsofPCHardwareandTroubleshooting – StronglyrelatedwithPSOs andPOs		

**ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625
514DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS**
Object Oriented Programming with C++

Class	:BCA	**Part II**	: CC-3
Semester	:II	**Hours**	: 75
Subject Code	:	**Credits**	: 4

Objectives:

The course enables the student to

- Understand the need of object oriented design principles in problems olving.
- Understand the dynamic memory management techniques using pointers, constructors, destructors.
- Develop programs using the concept of function overloading, operator overloading, virtual functions and polymorphism.
- Classify in heritance with the understanding of early and late binding, usage of exception handling, generic programming.
- Use various OOPs concepts with file stream classes.

UNIT I   15 Hours

Introduction to C++ - key concepts of Object - Oriented Programming - Advantages - Object Oriented Languages - I/O statement - declarations. Control Structures:-Decision Making and looping Statements - Functions:Inline functions - Function Overloading – string functions – Miscellaneous functions.

UNIT II   15 Hours

Classes and objects: Declaring Objects- Defining Member Functions - Static Member Variables and Functions - Array of objects - friend functions - Overloading member functions – Bit fields and classes –Constructor and destructor.

UNIT III   15 Hours

Operator overloading unary operators –over loading friend functions-type conversion - inheritance: types of inheritance-single, multilevel, multiple, ierarchal, hybrid inheritance –virtual base classes– abstract classes.

UNITIV   15 Hours

Pointers - Declaration - Pointer to Class, Object - This pointer - Pointers to derived classes and Base classes - Arrays - Characteristics- Array of classes – Memory models – new and delete operators-dynamic object-binding, polymorphism and virtual functions.

UNITV   15 Hours

Files - file stream classes - file modes - Sequential read / write operations –Binary and ASCII Files – Random Access Operation-Templates

Book for Study

1.Balagurusamy.E,*Objects Oriented Programming with C++*, Sixth Edition, Tata McGraw-Hill Publication, 2013.

Books for Reference

1. Kamthane N Ashok, *Object Oriented Programming with ANSI and Turbo C++*, Pearson Education Publication, 2003.
2. Litvin Maria, Gray, *C++for You*, Vikas Publication, 2002.
3. Hubbard R.John, *Programming with C*, Second Edition,TMH Publication, 2002.

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: Understand the need of object oriented design principles in problem solving.(K2)

CO2: Understand dynamic memory management techniques using pointers, constructors, destructors(K2)

CO3: Develop programs using the concept of function overloading, operator overloading,v irtual functions and polymorphism. (K3)

CO4: Develop programs using the concept of early and late binding, usage ofe xception handling, generic programming. (K3)

CO5: Apply various OOPs concepts with file stream classes.(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	1	1	2	2	1	3	3	-	-	2	1	1	-	17
CO2	2	2	2	2	1	3	2	-	-	2	2	2	-	20
CO3	3	3	2	1	2	3	3	-	-	2	3	3	-	25
CO4	3	2	2	1	2	3	3	-	-	2	2	1	-	21
CO5	3	3	3	1	2	3	3	-	-	2	2	2	-	24
	GrandTotalof COswithPOsPSOs													107
	Grand total with PSOs and POs **Meanvalue of COs with PSOs and POs= = 107/50)** **Number of COs relating with PSOs & POs**													**2.14**

Strong–3,Medium–2,Low – 1

MappingScale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
MeanValueofCOs withPSOsandPOs			2.14
Observation	COsofObjectOrientedProgrammingwithC++–Stronglyrelatedwith PSOsandPOs		

DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS
Object Oriented Programming Lab

Class	**:I -BCA**	**Part III: CC-4**	
Semester	**:II**	**Hours: 75**	
Subject Code	**:**	**Credits: 4**	

Objectives:

The course enables the student to

- Apply C++ features to program design and implementation.
- Demonstrate practical experience in developing object-oriented solutions.
- Apply object oriented techniques to solve bigger computing problems.
- Develop programs using file concepts
- Implement file concepts to develop projects with real world problems.

Lab Exercises

1. Armstrong Number Generation
2. To print right angled pyramid of numbers
3. Printing the name randomly on screen with colored text
4. Generating N Random Numbers between two specified numbers
5. To find total number of days from given month of year
6. Program using in line function
7. To generate random numbers
8. Implementing the use of reference variables
9. Write a program for magic Number
10. Program using Classes and Objects
11. Program using *Constructor and destructor*
12. Program using *in heritance*
13. Program using operato rover loading
14. Program using Files
15. Case Study

Course Outcomes:

On successful completion of the course students will be able to

CO1: Apply C++ features to program design and implementation.(K3)

CO2:Understand the OOPs concepts in developing solutions.(K2)

CO3:Apply object oriented concepts to solve computing problems.(K3)

CO4:Develop programs using file concepts.(K3)

CO5: Implement file concept to develop projects with real world problems.(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 ofCOs withPSOs& POs
CO1	3	2	2	1	-	3	3	-	-	2	1	1	-	18
CO2	2	2	2	2	1	3	2	-	-	2	2	2	-	20
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
	GrandTotalofCoswithPosPSOs													109
	MeanvalueofCOswithPSOsandPO				**GrandtotalwithPSOsandPOs** $\overline{}$ **=(109/50)** **NumberofCOsrelatingwithPSOs& POs**										2.18

Strong–3,Medium–2,Low – 1

MappingScale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
MeanValueofCOs withPSOsandPOs			2.18
Observation	COsofObjectOrientedProgrammingLab StronglyrelatedwithPSOsand POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSDATASTRUCTURES

Class	**: BCA**	**Part III :**	**Elective 2**
Semester	**: II**	**Hours**	**: 60**
Subject Code	**:**	**Credit**	**:03**

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.

UNITI   **12 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   **12Hours**
StacksandQueues:Fundamentals-StackandQueueADT-Operations-Exceptions-Applications.

UNIT III   **12 Hours**
Linked Lists: What is Linked list? – Linked List ADT– Why Linked List– Comparison of linked listwith Arrays – singly linked list – Doubly linked list –Circular linked list –A Memory efficient Doubly Linkedlist–Unrolled Linked List.

UNITIV   **12Hours**
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 –quicksort– Radixsort–Topological sort–Externalsorting.

UNITV   **12Hours**
 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. YashawanthKanetkar, Data Structures Through C++,4th Edition ,2022,BPB Publications.

Books for Reference
   1. Weiss Allen Mark, *Data Structuresand AlgorithmsinC* ,1997,Addison-Wesley.
   2. HorowitzEllitz, Sahni Sartaj, *Data Structures*, Second Edition, Universities Press.

Teaching Methods
- ➢ Lecturing
- ➢ Group Discussions
- ➢ PPTs
- ➢ Learning by Doing
- ➢ Videotutorials

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 datastructure (K2)
CO4: Implement appropriate sorting/searching technique for given problem.(K3)
CO5: Under stand the functions of compiler/interpreter(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 ofCOs withPSOs& 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
Grand total of COs with PSOs and POs														84
MeanValueof COswithPSOsandPOs=GrandtotalofCOswithPSOsandPOs/ NumberofCOsrelatingwithPSOsandPOs=(84/50)														**1.68**

  Strong–3,Medium–2,Low – 1

MappingScale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
MeanValueofCOs withPSOsandPOs		1.68	
Observation	COsofDataStructuresandAlgorithms–MediumrelatedwithPSOsand POs		

Class : BCA		**Part** : IIIElective 2
Semester : II		**Hours:60**
Subject Code:		**Credits:03**

Objectives:

The course enables the students to

- Understand the structure, function and characteristics of computer systems.
- Understand the elements of modern instructions sets and their impact on processor design
- Demonstrate the basics of computer arithmetic operations.
- Understand the working principles of Computer I/O.
- Understand the functions of different types of memory

UNITI **12 Hours**

Basic Computer Organization and Design:Instruction codes-computer registers and instructions – timing and control-instruction cycle-memory reference instructions- Input -Output-interrupt,complete computer-description-design of basic computer-design of accumulator logic.

UNIT II **12 Hours**

Central Processing Unit: register organisation - stack organisation - instruction formats – addressing modes-data transfer and manipulation- program control.

UNIT III **12 Hours**

ComputerArithmetic: Addition and subtraction, multiplication algorithms-division algorithms -floating point arithmetic operations.

UNITIV **12 Hours**

INPUT - OUTPUT Organization: Peripheral devices - input output interface Asynchronous data transfer - strobe control - handshaking - modes of transfer - priority - interrupt – direct memory access-Input/Output processor.

UNITV **12 Hours**

MemoryOrganization: Memory hierarchy-main memory associative memory-cachememory-virtual memory.

Text Book

1.Msno Moris,*C omputer System Architecture*, Pearson Prentice Hall, Third Edition, 2007.

Reference Books

1. Rao P.V.S, *Computer System Architecture*,PHI,2009.
2. Patterson A. David, John.L, *ComputerOrganisation and Design*,Morgan Kaufmann Publisher,2009.

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 fundamental knowledge of Computer Organization. (K2)
  CO2:Understand the various process of CPU.(K2)
  CO3:Understand different number systems, binary addition and subtraction, 2's complement
      representation and operations with this representation.(K2)
  CO4:Understand the functions I/O peripheral devices.(K2)
  CO5:Evaluate different elements of Memory Organization.(K5)

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	1	-	-	2	1	1	-	2	1	2	1	1	15
CO2	3	2	-	-	2	2	1	-	3	2	2	1	1	19
CO3	3	3	-	-	1	1	1	-	2	1	1	2	2	17
CO4	3	3	-	-	1	1	1	-	2	1	1	2	2	17
CO5	3	3	-	-	2	1	1	-	3	1	2	2	2	20
Grand total of COs with PSOs and POs														88
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs/ Number of COs relating with PSOs and POs=(88/50)														1.76

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		1.76	
Observation	COs of Computer Organization and Architecture–Medium related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE &APPLICATIONS
DISCRETE MATHEMATICS

Class :BCA	**Part III :Elective-2**
Semester :II	**Hours : 60**
Subject Code :	**Credits:03**

Objectives:
The course enables the student to
- Understand the concept of Set Theory
- Understand the concept of Mathematical Logic
- Apply the rules of inference and methods of proof including direct and indirect proof forms, proof by contradiction, and mathematical induction.
- Solve mathematical properties formally via the formal language of propositional logic and predicate logic.
- Apply the concepts of tree and graph algorithms to solve problems.

UNITI   12 Hours
Set theory: Introduction-set & its Elements - set Description - types of sets - Venn-Euler Diagrams - set operations & law of theory - fundamental products-partitions of sets min sets - Algebra of sets and Duality-inclusion and exclusion principle.

UNIT II   12 Hours
Mathematical logic: Introduction - prepositional calculus – Basic logical operations - Tautologies-Contradiction-Argument-methodofproof-predicatecalculus.

UNIT III   12 Hours
Relations: Binary Relations- set operation on relations-Type of Relations – Partial Order relation - Equivalencerelation-Compositionofrelations-Functions:Typesoffunctions-invertiblefunctions -Composition of functions.

UNITIV   12Hours
Languages - Operations on languages - Regular Expressions and regular Languages – Grammar: Types of Grammars-Finite state machine -Finite-State automata.

UNITV   12 Hours
Graphtheory: Basic terminology-paths, Cycle &Connectivity-sub Graphs:Types Of graphs-Representation of graphs in compute memory- trees- properties of trees- Binary Trees – traversing Binary trees–Computer Representation of general trees.

Book for study
1.SharmaJ.K, *Discrete Mathematics*, Macmillan India Ltd, Second Edition,2 005.

Books for Reference
1. ThemblayJ.P, Manohar R,*Discrete Mathematics Structures with Applications to Computer Science*, McGraw Hill International, 1987.
2. Venketaramen.M.K, Sridharan.N, Chadarasekaran.N, *Discrete Mathematics*, The National Publishing Company, Chennai.

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: Construct simple mathematical proofs and possess the ability to verify them.(K1)

CO2: Have substantial experience to comprehend formal logical arguments.(K2)

CO3: Apply the rules of inference and methods of proof including irect and in direct proof forms, proof by contradiction, and mathematical induction.(K3)

CO4: Solve mathematical properties formally via the formal language of propositional logic and predicate logic.(K4)

CO5: Use tree and graph algorithms to solve problems. (K5)

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	1	1	2	-	1	3	3	-	-	1	1	1	-	14
CO2	2	2	2	-	1	3	2	-	-	2	2	2	-	18
CO3	3	3	2	-	2	3	3	-	-	2	2	3	-	23
CO4	3	2	2	-	1	3	3	-	-	2	2	1	-	19
CO5	3	3	3	-	2	3	3	-	-	2	2	2	-	23
	Grand Total of Cos with Pos PSOs													97
	MeanvalueofCoswithPSOsandPOs= $\dfrac{GrandtotalwithPSOsandPOs}{NumberofCOsrelatingwithPSOs\&POs}$ =(97 /45)													2.15

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
MeanValue of COs With PSOs and POs			2.15
Observation	COs of Discrete Maths–Strongly related with PSOs and POs		

Class	:BCA	**PartIII:SEC-2**
Semester	:II	**Hours:30**
Subject Code:		**Credit: 03**

Objectives:

The course enables the student to

- Apply basic HTML concepts increating program.
- Understand the tags of creating tables, frames and forms.
- Apply CSS concept indesign smart website.
- Understand the usage of Photoshop tools.
- Understand the techniques for image enhancement

UNITI **06 Hours**

HTML: Introduction to HTML – title – document tags – fonts – background - heading level tags –creating paragraph and line break–Editing & Formatting.

UNIT II **06 Hours**

Creating hypertext link and link list – using Inline images – relative URL – horizontal rules.- Tables -Rows – Columns – Cell columns – Centering table.

UNIT III **06Hours**

Frames: Frameset-properties-frame-linking html files into frames – Forms -Image map.

UNITIV

Dynamic HTML: CSS: Introduction – Inline styles –CSS Selectors- Creating styles sheets with the style element –Conflicting styles – Types of including style sheets: inline style sheets – internal style sheets-external style sheets. **06Hours**

UNITV

Positioning Elements – Backgrounds – Element Dimensions –Text flow and the Box model– user style sheets **06 Hours**

Book for Study

1. Prem kumar, Web Design with HTML & CSS,2021, Notion Publication

Books for Reference

1. Deitel, *Internet and World Wide Web How to program,* Prentice Hall, Third Edition, 2003.
2. Meenakshi GM, *Web Graphics*, SCITECH Publication, 2007.

Course Outcomes:

On successfulcompletion 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 / 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	Sumof COswithPSOs &POs
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
Meanvalue of COs with PSOs and POs = $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}}$ = (114/50)														2.28

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
MeanValue of COs With PSOs and POs			2.28
Observation	COs of Web Designing–Strongly related with PSOs and POs		

DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
WEB DESIGNING

Class	**:BCA**	**PartIII:SEC-3**
Semester	**:II**	**Hours:30**
Subject Code:		**Credit: 03**

Objectives:

The course enables the student to

- Apply basic HTML concepts increating program.
- Understand the tags of creating tables, frames and forms.
- Apply CSS concept indesign smart website.
- Understand the usage of Photoshop tools.
- Understand the techniques for image enhancement

UNITI   **06 Hours**

HTML: Introduction to HTML – title – document tags – fonts – background - heading level tags –creating paragraph and line break–Editing & Formatting.

UNIT II   **06 Hours**

Creating hypertext link and link list – using Inline images – relative URL – horizontal rules.- Tables -Rows – Columns – Cell columns – Centering table.

UNIT III   **06Hours**

Frames: Frameset-properties-frame-linking html files into frames – Forms -Image map.

UNITIV

Dynamic HTML: CSS: Introduction – Inline styles –CSS Selectors- Creating styles sheets with the style element –Conflicting styles – Types of including style sheets: inline style sheets – internal style sheets-external style sheets.   **06 Hours**

UNITV

Positioning Elements – Backgrounds – Element Dimensions –Text flow and the Box model– user style sheets   **06 Hours**

Book for Study

1. Premkumar, Web Design with HTML & CSS,2021, Notion Publication

Books for Reference

3. Deitel, *Internet and World Wide Web How to program,* Prentice Hall, Third Edition, 2003.
4. Meenakshi GM, *Web Graphics*, SCITECH Publication, 2007.

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 / 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	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
Meanvalue of COs with PSOs and POs= $\dfrac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \&POs}}$ = (114/50)														2.28

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			2.28
Observation	COs of Web Designing–Strongly related with PSOs and POs		

NEW CURRICULUM STRUCTURE

Template for UG Programmes – Semester-Wise
(as per TANSCHE guidelines to be followed from 2023-24 onwards)
First Year
Semester – I

Semester I			
Part	List of Courses	Credit	Hours per week (L/T/P)
Part-I	Language	3	6
Part-II	English	3	4
Part-III	Core Courses 2 (CC1, CC2)	8	10
	Elective Course 1 (Generic / Discipline Specific) EC1	3	4
Part-IV	Skill Enhancement Course SEC-1 (Non Major Elective)	2	2
	Foundation Course FC	2	2
	Ability Enhancement Compulsory Course (AECC 1) Soft Skill-1	2	2
		23	**30**
Semester II			
Part	List of Courses	Credit	Hours per week (L/T/P)
Part-I	Language	3	6
Part-II	English	3	4
Part-III	Core Courses 2 (CC3, CC4)	8	10
	Elective Course 1 (Generic / Discipline Specific) EC2	3	4
Part-IV	Skill Enhancement Course SEC-2 (Non Major Elective)	2	2
	Skill Enhancement Course SEC-3 (Discipline Specific / Generic)	2	2
	Ability Enhancement Compulsory Course (AECC 2) Soft Skill-2	2	2
		23	**30**

Second Year

Semester III			
Part	List of Courses	Credit	Hours per week (L/T/P)
Part-I	Language	3	6
Part-II	English	3	4
Part-III	Core Courses 2 (CC5, CC6)	8	10

Part	List of Courses	Credit	Hours per week (L/T/P)
	Elective Course 1 (Generic / Discipline Specific) EC3	3	4
Part-IV	Skill Enhancement Course SEC-4 (Entrepreneurial Based)	1	1
	Skill Enhancement Course SEC-5 (Discipline Specific / Generic)	2	2
	Ability Enhancement Compulsory Course (AECC 3) Soft Skill-3	2	2
	Environmental Studies (EVS)	1	1
		23	**30**

Semester IV			
Part	List of Courses	Credit	Hours per week (L/T/P)
Part-I	Language	3	6
Part-II	English	3	4
Part-III	Core Courses 2 (CC7, CC8)	8	9
	CC7 : Core Industry Module – I – Industrial Statistics		
	CC8 : Any Core Paper		
	Elective Course 1 (Generic / Discipline Specific) EC4	3	4
Part-IV	Skill Enhancement Course – SEC 7	2	2
	Skill Enhancement Course – SEC 8 (Discipline Specific / Generic)	2	2
	Ability Enhancement Compulsory Course (AECC 4) Soft Skill-4	2	2
	Environmental Studies EVS	1	1
		24	**30**

Third Year

Semester V			
Part	List of Courses	Credit	Hours per week (L/T/P)
Part-III	Core Courses 3 (CC9, CC110, CC11)	12	15
	Elective Courses 2 (Generic / Discipline Specific) EC5, EC6	6	10
	Core/Project with Viva Voce CC12	4	4
Part-IV	Value Education	1	1
	Internship / Industrial Training (Carried out in II year summer vacation) (30 hours)	2	-
		25	**30**

Semester VI			
Part	**List of Courses**	**Credit**	**Hours per week (L/T/P)**
Part-III	Core Courses 3 (CC13, CC14, CC15)	12	15
	Elective Courses 2 (Generic / Discipline Specific) EC7, EC8	6	10
Part-IV	Professional Competency Skill Enhancement Course SEC9	2	4
	Value Education	1	1
Part-V	Extension Activity (Outside college hours)	1	-
		22	**30**

Total Credits : 140*

*ARISE & Self Learning,MOOC/SWAYAM (extra credits)

Internal marks:25
External marks:75

Template for PG programmes – Semester wise

(as per TANSCHE guidelines to be followed from 2023-24 onwards)

Part	Semester – I	Credit	Hours per week
A	Core courses 3 (cc1, cc2, cc3)	12	15
	Elective courses-2(Generic/Discipline Specific) EC1, EC2	6	10
B	Skill Enhancement Course -SEC1	2	3
	Ability Enhancement Compulsory Course (AECC1) – Soft Skill1	2	2
		22	30
Part	Semester – II	Credit	Hours per week
A	Core courses 3 (cc4, cc5, cc6)	12	15
	Elective courses-2(Generic/Discipline Specific)EC3, EC4	6	10
B	Skill Enhancement Course -SEC2	2	3
	Ability Enhancement Compulsory Course (AECC2) – Soft Skill2	2	2
		22	30
Part	Semester – III	Credit	Hours per week
A	Core courses 3 (cc7, cc8, cc9)	12	15
	Elective courses-1(Generic/Discipline Specific) EC5	3	5
	Core Industry module	**3**	**4**
B	Skill Enhancement Course -SEC3 Professional communication skill (Term paper & seminar presentation)	2	4
	Ability Enhancement Compulsory Course (AECC3) – Soft Skill3	2	2
	Internship / Industrial activity (carried out in summer vacation at the end of Sem II)	2	
		24	30
Part	Semester – IV	Credit	Hours per week
A	Core courses 3 (cc10, cc11, cc12)	12	15
	Elective courses-1(Generic/Discipline Specific) EC6	3	5
	Project with viva voce	**3**	**4**
B	Skill Enhancement Course -SEC3 Training for competitive examinations	2	4
	Ability Enhancement Compulsory Course (AECC4) – Soft Skill4	2	2
C	Extension activity (can be carried outside the class hours)	1	
		23	30

Total credits = 91*

* Self Learning through MOOC/SWAYAM(extra credits)
Internal marks:25, External marks:75