SR - 3

# KOVAI KALAIMAGAL

## COLLEGE OF ARTS AND SCIENCE

(Autonomous)

(Affiliated to Bharathiar University, Coimbatore)


# B.Sc. Mathematics with Computer Applications

## Scheme and Regulations

**For the Students Admitted during the Academic Year 2018-2019.**

Re-Accredited with 'A' Grade by NAAC
Narasipuram Post,
Coimbatore – 641109
Phone: 0422-2970131 / 132, Fax : 0422-2970427
Mobil: 9500564940
Web: www.kkcas.edu.in, Email : kkcas@kkcas.edu.in

**KOVAI KALAIMAGAL COLLEGE OF ARTS AND SCIENCE**
**(Autonomous)**

## Vision

Kovai Kalaimagal College of Arts and Science shall inspire and guide students to acquire knowledge, develop skill and a positive attitude that will enhance their personality, providing self – confidence to face the competitive world.

## Mission

- To strive for excellence in academics.
- To inculcate a positive attitude and to develop skill in students, to meet the challenges of the competitive world.
- To develop self-confidence through adequate inter-action and relevant exposure.
- To promote ethical and social values in the students.
- To identify and encourage talents in academics and sports by rewarding them with scholarships.

## Quality Policy

“KKCAS shall provide value – based education to its students for continual improvement in their academic performance, enhancing in their competency for higher education and empolyment.”

# VISION, MISSION AND OBJECTIVES OF THE DEPARTMENT

## VISION

The department of Mathematics aspires to become a centre of excellence by providing quality education and producing employable graduates who possess adequate knowledge in applications of mathematics to the real world situation, soft skils as per the expectation of the employers and human values having concern for the fellow human beings and welfare of this society.

## MISSION

- To provide strong foundation in the basic concepts of various branches of mathematics.
- To enrich the students with analytical and logical skills through rigorous training.
- To train the students to develop skills of critical thinking and problem solving.
- To develop self confidence, positive attitude of students through self development programmes.
- To inculcate ethical and social values of the students so as to have concern for human begins and their welfare.

## OBJECTIVES OF THE DEPARTMENT

- To conduct Bridge course for all the Non-Mathematics first year UG Classes at the beginning of the academic year.
- To conduct Mathematical Quiz competition on the eve of the Birth Anniversary of the great Mathematician Srinivasa Ramanujam.
- To keep the students abreast with the latest trends, seminars will be conducted.
- To make the students proficient in Mathematical aptitude training programmes and tests will be conducted for the final year students.
- To involve the students in Community service as a Part of their Social responsibilities.

# GRADUATE ATTRIBUTES

1. Communication skills
2. In-depth domain knowledge
3. Technical skills
4. Knowledge Inter-disciplinary in nature
5. Positive attitude
6. Critical thinking and problem solving skills
7. Dynamism and team building skills
8. Professional ethics and social values
9. Self-awareness and emotional inteligence
10. Entrepreneurship qualitities
11. Responsibility towards  Society and environment
12. Thirst for knowledge through life long learning

## PROGRAMME EDUCATIONAL OBJECTIVES AND PROGRAMME OUTCOME

### PROGRAMME EDUCATIONAL OBJECTIVES

**PEO1:** Graduates would occupy convenant positions in various types of industries, executing their tasks with professionalism and professional ethics.

**PEO2:** Graduates would pursue research in socially relevant fields.

**PEO3:** Graduates would have concern for fellow human beings and contribute to the welfare of the society.

### PROGRAMME OUTCOMES

After completion of three years of study, our B.Sc Mathematics (CA) graduates will be able to :

**PO1:** Communicates effectively to others in both oral and written form specifically in the globalized scenario.

**PO2:** Have strong foundation with basic concepts and acquire adequate domain specific knowledge.

**PO3:** Gain proficiency in computer technology, modern tools used for numerical and statistical computation.

**PO4:** Acquire adequate Knowledge in Inter-disciplinary subjects like accounts and computer science for understanding of application of mathematical concepts in such subjects.

**PO5:** Develop self confidence and hence positive attitude to face the challenges in the competitive world.

**PO6:** Understand, analyze the problem in multiple perspectives and provide innovative solutions.

**PO7:** Perform as an effective team leader with dynamic attitude to demonstrate mathematical and computing skills.

**PO8:** Recognize and apply professional ethics and social values to become a responsible citizen and have concern for environment protection and well being of the society.

**PO9:** Realize one's own potential and acquire the skills to the emotionally balanced in stress full situations.

**PO10:** Take efforts to become Job providers rather than job seekers.

**PO11:** Realizing the responsibilities towards the society and to protect the environment,use ours professional knowledge for providing better lining condition to the people.

**PO12:** Motivate the students to have longing for learning in grow to keep oneself abreast of the developments particularly in various application of Mathematical techniques in diverse fields of activities.

## MAPPING OF GRADUATE ATTRIBUTES WITH PROGRAMME OUTCOMES

| S. No. | GRADUATES ATTRIBUTES | PROGRAM OUTCOME |
|---|---|---|
| 1 | Communication skills | Communicates effectively to others in both oral and written form specifically in the globalized scenario. |
| 2 | In-depth domain knowledge | Have strong foundation with basic concepts and acquire adequate domain specific knowledge. |
| 3 | Technical skills | Gain proficiency in computer technology, modern tools used for numerical and statistical computation. |
| 4 | Knowledge Inter-disciplinary in nature | Acquire adequate Knowledge in Inter-disciplinary subjects like accounts and computer science for understanding of application of mathematical concepts in such subjects. |
| 5 | Positive attitude | Develop self confidence and hence positive attitude to face the challenges in the competitive world. |
| 6 | Critical thinking and problem solving skills | Understand, analyze the problem in multiple perspectives and provide innovative solutions. |
| 7 | Dynamism and team building skills | Perform as an effective team leader with dynamic attitude to demonstrate mathematical and computing skills. |
| 8 | Professional ethics and social values | Recognize and apply professional ethics and social values to become a responsible citizen and have concern for environment protection and well being of the society. |
| 9 | Self-awareness and emotional inteligence | Realize one's own potential and acquire the skills to the emotionally balanced in stress full situations. |
| 10 | Entrepreneurship qualitities | Take efforts to become Job providers rather than job seekers. |
| 11 | Responsibility towards Society and environment | Realizing the responsibilities towards the society and to protect the environment,use ours professional knowledge for providing better lining condition to the people. |
| 12 | Thirst for knowledge through life long learning | Motivate the students to have longing for learning in grow to keep oneself abreast of the developments particularly in various application of Mathematical techniques in diverse fields of activities. |

**KOVAI KALAIMAGAL COLLEGE OF ARTS AND SCIENCE**

**(An Autonomous Institute Affiliated to Bharathiar University)**

**Re - accredited with "A" grade by NAAC**

**Regulations for Undergraduate Programmes**

**(Under Choice Based Credit System)**

**(Effective from 2018 – 2019)**

## 1. REGULATIONS

This regulation is effective from the academic year 2018 -2019.

### 1.1. Eligibility for Admission

| Course | Eligibility Condition |
|---|---|
| UG - Science Stream | A pass in higher secondary course. Preference will be given to those who have studied Mathematics as one of the subjects. |
| UG - Arts Stream | A pass in higher secondary course. |

### 1.2. Duration and Course of Study

Three Academic years with six semesters, the duration of the first, third and fifth Semesters from June to November and the second, fourth and sixth Semesters from December to April. The duration of each semester is 90 working days.

### 1.3. The Medium of Instruction and Examinations

The medium of instruction and examinations shall be English.

### 1.4. Requirements for Attendance

- A candidate will be permitted to take the examination for any semester, if he/she secures not less than 75% of attendance out of the 90 working days during the semester.

- A candidate who has secured attendance less than 75% but 65% and above shall apply with the prescribed fee for the condonation of lack of attendance. On the recommendation of the Principal, he/she will be permitted to take up the examination.

- A candidate who has secured attendance less than 65% but 55% and above in any semester, will be permitted to continue the course but will not be permitted to appear for the examination in the current papers. However he/she will be permitted to appear for the examination in the papers in which he/she has arrears. He/she will have to compensate the shortage of attendance in the subsequent semester and take the examination in the papers of both the semester together.

- A candidate who has secured less than 55% of attendance in any semester will not be permitted to take the regular examinations and to continue the study in the subsequent semester. He/she has to re-do the course by rejoining in the semester in which the attendance is less than 55%.

- A candidate who has secured less than 65% of attendance in the final semester has to compensate his / her attendance shortage in a manner to be decided by the Head of the Department concerned after rejoining the course.

### 1.5 Restriction to take the Examinations

- Any candidate having arrear paper(s) shall have the option to take the examinations in any arrear paper(s) along with the subsequent regular semester papers.

- Candidates who fail in any of the papers shall pass the paper(s) concerned within five years from the date of admission to the said course. If they fail to do so, they shall take the examination in the revised text / syllabus, if any, prescribed for the immediate next batch of candidates. If there is no change in the text / syllabus they shall take the examination in that paper with the syllabus in vogue, until there is a change in the text or syllabus.

  In the event of removal of that paper consequent to the change of regulations and / or curriculum after a five year period, the candidates shall have to take up an equivalent paper in the revised syllabus as suggested by the chairman and fulfill the requirements as per regulations/curriculum for the award of the degree.

### 1.6 The Evaluation System

The major objective of the institution's evaluation system is to motivate all students to excel in their performance. The students' performance is continually assessed through Continuous Assessment (CIA) and End Assessment (EAE). The CIA, EAE break up for theory papers is 25:75 and practical is 40:60.

#### 1.6.1. Break Up of Continuous Internal Assessment (CIA) Marks

**For UG Courses – Theory (Languages, English, Core, Allied and Elective )**

| Content | Marks Awarded |
|---|---|
| Continous Internal Assessment Test I | 05 |
| Continous Internal Assessment Test II | 05 |
| Model Examination | 10 |
| Assignment (2 Numbers) | 05 |
| Total | **25** |

**For UG Courses – Theory (Communication Skills, Mathematics for Competitive Examinations and Aptitude & Soft Skills)**

| Content | Marks Awarded |
|---|---|
| Continuous Internal Assessment Test I | 25* |
| Continuous Internal Assessment Test II | |
| Continuous Internal Assessment Test III | 25 |
| Total | **50** |

*****Test I and Test II will be evaluated for 25 marks each and the average of these two will be considered.

**For UG Courses - Practical**

| Content | Marks Awarded (Max Marks: 100) | Marks Awarded (Max Marks: 50) |
|---|---|---|
| Minimum ten Experiments / Practical Paper / Semester | 20 | 05 |
| Continuous Internal Assessment Test | 05 | 05 |
| Model Exam | 10 | 05 |
| Record Note Book | 05 | 05 |
| Total | **40** | **20** |

**For Project Viva Voce**

| Content | Marks Awarded |
|---|---|
| Review and Content Presentation (3 Reviews) (3*20) | 60 |
| Project Report | 20 |
| **Total** | **80** |

**1.6.2. End Assessment Examinations (EAE)**

a) Semester examination will be conducted at the end of each semester after completing a minimum of 90 working days.

b) End Assessment Examination for the odd semester will generally be held during November and even semester during April.

c) The question papers for all the courses will be set by the external examiners.

d) The exam will be conducted for a maximum of 75 marks for three hours. The passing minimum is 40% (30 out of 75 marks) and overall passing minimum putting the CA and EAE marks together will be 40%.

e) Question Paper Pattern: **( Languages, English, Core, Allied and Elective )**

| | | |
|---|---|---|
| **Part A** | 20 Marks | 10 Questions - 2 Marks each – Descriptive type |
| **Part B** | 25 Marks | 5 Questions- 5 Marks each – either or type |
| **Part C** | 30 Marks | 3 Questions out of 5 questions- 10 Marks each |
| **Total** | **75 Marks** | |

f) The exam will be conducted for a maximum of 50 marks for three hours. The passing minimum is 40% (20 out of 50 marks).

g) Question Paper Pattern: **( Value Based Education & Non Major Elective )**

| | | |
|---|---|---|
| **Part A** | 50 Marks | 5 Questions - either or type of question - 10 Marks each |

h) Question paper pattern : **(Extra Credit Courses)**

| | | |
|---|---|---|
| **Part A** | 40 Marks | 5 Questions- 8 Marks each – either or type. |
| **Part B** | 60 Marks | 5 Questions- 12 Marks each – either or type. |
| **Total** | **100 Marks** | |

i) The mark secured in the extra credit course will get reflected in the mark sheet only if the candidate has secured 40% marks and above.

j) The students will be allowed to choose only two papers per semester under the extra credit courses from third semester onwards.

**k) For UG Courses - Practical**

| Content | Marks Awarded (Max Marks: 100) | Marks Awarded (Max Marks: 50) |
|---|---|---|
| Program - 1 | 20 | 10 |
| Program - 2 | 20 | 10 |
| Viva voce | 10 | 05 |
| Record | 10 | 05 |
| Total | **60** | **30** |

**l) For UG Courses - Project Viva Voce**

The evaluation for the End Semester examination should be as per the norms given below.

| Content | Marks Awarded |
|---|---|
| Viva Voce | 20 |
| Total | **20** |

m) There will be one independent valuation for all theory papers of UG courses by external examiner.

n) A candidate may request for re-totalling/revaluation of his/her answer script by submitting an application addressing to the Controller of Examination through the Principal, paying the prescribed fee. This provision is available for all theory papers taken in the EAE. However there is no provision for revaluation of Practical papers.

o) Candidates desirous of improving the marks awarded in a passed subject in their first attempt shall reappear once within a period of subsequent two semesters. The improved marks shall be considered for classification but not for ranking. When there

p) Supplementary examination will be conducted for the benefit of final year students after 15 days of the declaration of the final semester results. Candidate who has arrears in any semester subject to a maximum of three papers can appear for the supplementary exam conducted after the final semester.

## 1.7 Grading

The following table gives the marks, grade points, letter grades and classification to indicate the performance of the candidate.

Conversion of Marks to Grade Points and Letter Grades (Performance in a Course/Paper)

| Range of Marks | Grade Points | Letter Grade | Description |
|---|---|---|---|
| 90-100 | 9.0-10.0 | O | Outstanding |
| 80-89 | 8.0-8.9 | D+ | Excellent |
| 75-79 | 7.5-7.9 | D | Distinction |
| 70-74 | 7.0-7.4 | A+ | Very Good |
| 60-69 | 6.0-6.9 | A | Good |
| 50-59 | 5.0-5.9 | B | Above Average |
| 40-49 | 4.0-4.9 | C | Average |
| 00-39 | 0.0 | U | Re - Appearance |
| ABSENT | 0.0 | AB | Absent |

$C_i$ = Credits earned for course i in any semester

$G_i$ = Grade Point obtained for course i in any semester

n = refers to the semester in which such course were credited

**For a Semester:**

GRADE POINT AVERAGE [GPA] = $\sum_i C_i G_i / \sum_i C_i$

$$GPA = \frac{\text{Sum of the multiplication of grade points by the credits of the courses}}{\text{Sum of the credits of the courses in a semester}}$$

**For the Entire Programme:**

CUMULATIVE GRADE POINT AVERAGE [CGPA] = $\sum_n \sum_i C_{ni} G_{ni} / \sum_n \sum_i C_{ni}$

$$CGPA = \frac{\text{Sum of the multiplication of grade points by the credits of the entire programme}}{\text{Sum of the credits of the courses of the entire programme}}$$

**Classification of Successful candidates**

A candidate who passes all the examinations in Part I to Part IV securing following CGPA and Grades shall be declared as follows for each part:

| CGPA | Grade | Classification of Final Result |
|---|---|---|
| 9.5 and above up to 10.0 | O+ | First Class – Exemplary* |
| 9.0 and above but below 9.5 | O | |
| 8.5 and above but below 9.0 | D++ | First Class with Distinction* |
| 8.0 and above but below 8.5 | D+ | |
| 7.5 and above but below 8.0 | D | |
| 7.0 and above but below 7.5 | A++ | First Class |
| 6.5 and above but below 7.0 | A+ | |
| 6.0 and above but below 6.5 | A | |
| 5.5 and above but below 6.0 | B+ | Second Class |
| 5.0 and above but below 5.5 | B | |
| 4.5 and above but below 5.0 | C+ | Third Class |
| 4.0 and above but below 4.5 | C | |
| 0.0 and above but below 4.0 | U | Re-Appearance |

*** The candidates who have passed in the first appearance and within the prescribed semester of the Programme (Major, Allied and Elective Course alone) are eligible.**

1.8 Course Completion

Students shall complete the programme within a period not exceeding three years for UG courses from the date of admission.

**SCHEME OF EXAMINATION AND PROGRAMME STRUCTURE**

**B.Sc. (Mathematics with Computer Applications) (2018 – 2021)**

| Part | Subject code | Study Components | Ins. hours per week | CIA | Exam | Total | Credits |
|---|---|---|---|---|---|---|---|
| **Semester - I** | | | | | | | |
| **I** | **18U1TALT01** | **Language 1 :** Paper I | 5 | 25 | 75 | 100 | 3 |
| **II** | **18U1ENLT01** | **Language 2 :** Functional English I | 5 | 25 | 75 | 100 | 3 |
| **III** | **18U1MCCT01** | **Core 1:** Calculus | 6 | 25 | 75 | 100 | 4 |
| | **18U1MCCT02** | **Core 2:** Algebra and Trigonometry | 6 | 25 | 75 | 100 | 4 |
| | **18U1MCAT01** | **Allied 1:** Mathematical Statistics - I | 7 | 25 | 75 | 100 | 4 |
| **IV** | **18U1VBET01** | **Value Based Education 1:** Environmental Studies | 2 | - | 50 | 50 | 2 |
| | **18U1SBST01** | **Skill Based Subject 1 :** Mathematics for Competitive Examinations I | 2 | 50 | - | 50 | 2 |
| | - | Sports | 2 | - | - | - | - |
| | - | Library | 1 | - | - | - | - |
| | | | **36** | | | **600** | |
| | | | | | | **Total Credits** | **22** |
| **Semester – II** | | | | | | | |
| **I** | **18U2TALT02** | **Language 1 :** Paper II | 5 | 25 | 75 | 100 | 3 |
| **II** | **18U2ENLT02** | **Language 2 :** Functional English II | 5 | 25 | 75 | 100 | 3 |
| **III** | **18U2MCCT03** | **Core 3:** Analytical Geometry of Three Dimensions | 6 | 25 | 75 | 100 | 4 |
| | **18U2MCCT04** | **Core 4:** Programming in C | 4 | 25 | 75 | 100 | 3 |
| | **18U2MCCP05** | **Core 5:** Programming in C – Practical | 3 | 40 | 60 | 100 | 2 |
| | **18U2MCAT02** | **Allied 2:**Mathematical Statistics - II | 6 | 25 | 75 | 100 | 4 |
| **IV** | **18U2VBET02** | **Value Based Education 2:** Ethics and Culture** | 2 | - | 50 | 50 | 2 |
| | **18U2SBST02** | **Skill Based Subject 2 :** Mathematics for Competitive Examinations II | 2 | 50 | - | 50 | 2 |
| | - | Sports | 2 | - | - | - | - |
| | - | Library | 1 | - | - | - | - |
| | | | **36** | | | **700** | |
| | | | | | | **Total Credits** | **23** |
| **Semester – III** | | | | | | | |
| **III** | **18U3MCCT06** | **Core 6:** Vector Calculus & Fourier Series | 7 | 25 | 75 | 100 | 4 |
| | **18U3MCCT07** | **Core 7:** Statics | 6 | 25 | 75 | 100 | 4 |
| | **18U3MCCT08** | **Core 8:** Programming in C++ | 5 | 25 | 75 | 100 | 3 |
| | **18U3MCCP09** | **Core 9:** Programming in C++ -Practical | 3 | 40 | 60 | 100 | 2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **18U3MCAT03** | **Allied 3:** Accountancy - I | 6 | 25 | 75 | 100 | 4 |
| **IV** | **18U3NMET01** | **Non Major Elective 1:** Food Science and Nutrition | 2 | - | 50 | 50 | 2 |
| | **18U3SBST03** | **Skill Based Subject 3 :** Mathematics for Competitive Examinations III | 2 | 50 | - | 50 | 2 |
| | **18U3SBST04** | **Skill Based Subject 4 :** Communication Skill I | 2 | 50 | - | 50 | 2 |
| | **18U3BTLT01** | **Non-Credit Course I:** Basic Tamil I / Advance Tamil - I # | - | - | - | - | - |
| | - | Sports | 2 | - | - | - | - |
| | - | Library | 1 | - | - | - | - |
| | | | **36** | | | **650** | |
| | | | | | | **Total Credits** | **23** |
| **Semester – IV** | | | | | | | |
| **III** | **18U4MCCT10** | **Core 10:** Differential Equations & Laplace Transforms | 7 | 25 | 75 | 100 | 4 |
| | **18U4MCCT11** | **Core 11:** Dynamics | 6 | 25 | 75 | 100 | 4 |
| | **18U4MCCT12** | **Core 12:** Data Structures using C++ | 5 | 25 | 75 | 100 | 3 |
| | **18U4MCCP13** | **Core 13:** Data Structures using C++ – Practical | 3 | 40 | 60 | 100 | 2 |
| | **18U4MCAT04** | **Allied 4:** Accountancy – II | 6 | 25 | 75 | 100 | 4 |
| **IV** | **18U4NMET02** | **Non Major Elective 2:** Floriculture | 2 | - | 50 | 50 | 2 |
| | **18U4SBST05** | **Skill Based Subject 5 :** Mathematics for Competitive Examinations IV | 2 | 50 | - | 50 | 2 |
| | **18U4SBST06** | **Skill Based Subject 6 :** Communication Skill II | 2 | 50 | - | 50 | 2 |
| | **18U4BTLT02** | **Non-Credit Course II:** Basic Tamil II / Advance Tamil - II # | - | - | - | - | - |
| | - | Sports | 2 | - | - | - | - |
| | - | Library | 1 | - | - | - | - |
| | | | **36** | | | **650** | |
| | | | | | | **Total Credits** | **23** |
| **Semester – V** | | | | | | | |
| **III** | **18U5MCCT14** | **Core 14:** Real Analysis | 6 | 25 | 75 | 100 | 5 |
| | **18U5MCCT15** | **Core 15:** Modern Algebra | 6 | 25 | 75 | 100 | 5 |
| | **18U5MCCT16** | **Core 16:** Visual Basic | 5 | 25 | 75 | 100 | 3 |
| | **18U5MCCP17** | **Core 17:** Visual Basic – Practical | 3 | 40 | 60 | 100 | 2 |
| | | **Elective 1:** | 5 | 25 | 75 | 100 | 3 |
| | | **Elective 2:** | 5 | 25 | 75 | 100 | 3 |
| **IV** | **18U5NCCT01** | **Non Credit Course III :** Aptitude and Soft Skills I | 3 | - | - | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | - | Sports | 2 | - | - | - | - |
| | - | Library | 1 | - | - | - | - |
| | | | **36** | | | **600** | |
| | | | | | | **Total Credits** | **21** |
| | | **Semester – VI** | | | | | |
| **III** | **18U6MCCT18** | **Core 18:** Complex Analysis | 5 | 25 | 75 | 100 | 5 |
| | **18U6MCCT19** | **Core 19:** Discrete Mathematics | 5 | 25 | 75 | 100 | 5 |
| | **18U6MCCT20** | **Core 20:** MATLAB | 5 | 25 | 75 | 100 | 4 |
| | **18U6MCCP21** | **Core 21:**Mat Lab –Practical | 3 | 40 | 60 | 100 | 2 |
| | **18U6MCCV22** | **Core 22:** Project Work and Viva Vice | 2 | 80 | 20 | 100 | 6 |
| | | **Elective 3:** | 5 | 25 | 75 | 100 | 3 |
| | | **Elective 4:** | 5 | 25 | 75 | 100 | 3 |
| **IV** | **18U6NCCT02** | **Non Credit Course IV:** Aptitude and Soft Skills II | 3 | - | - | - | - |
| | - | Sports | 2 | - | - | - | - |
| | - | Library | 1 | - | - | - | - |
| | | | **36** | | | **700** | |
| | | | | | | **Total Credits** | **28** |
| **Total** | | | **216** | | | **3900** | **140** |

***** will not be considered for the calculation of CGPA

****** Answers to the questions may also be given in Tamil

**#** The students who have not studied tamil in Higher Secondary Course and not opted for Tamil under language I in the degree programme have necessarily to study Basic Tamil for 2 Hours/Week during III and IV Semesters after their regular college working hours.

**List of Electives**

| Electives | Subject Code | Name of the Subjects |
|---|---|---|
| **Elective 1** | **18U5MCET1A** | Optimization Techniques-I |
| | **18U5MCET1B** | Software Engineering |
| | **18U5MCET1C** | Linear Algebra |
| **Elective 2** | **18U5MCET2A** | Numerical Methods |
| | **18U5MCET2B** | Number Theory |
| | **18U5MCET2C** | Digital Electronics and Computer Fundamentals |
| **Elective 3** | **18U6MCET3A** | Optimization Techniques-II |
| | **18U6MCET3B** | Actuarial Mathematics |
| | **18U6MCET3C** | Information Security |
| **Elective 4** | **18U6MCET4A** | Fuzzy Mathematics |
| | **18U6MCET4B** | Applied Mathematics |
| | **18U6MCET4C** | Computer Networks |

| EXTRA CREDIT COURSES | | |
|---|---|---|
| **Course Code** | **Subjects** | **Credits** |
| 2018ECC001 | சுற்றுலா வளர்ச்சி | 2 |
| 2018ECC002 | இதழியல் கலை | 2 |
| 2018ECC003 | நாட்டுப்புறவியல் | 2 |
| 2018ECC004 | கணிப்பொறியில் தமிழ் | 2 |
| 2018ECC005 | தமிழக வரலாறும் மக்கள் பண்பாடும் | 2 |
| 2018ECC006 | தமிழ் இலக்கிய வரலாறு | 2 |
| 2018ECC007 | New Media | 2 |
| 2018ECC008 | Proofreading And Copyediting | 2 |
| 2018ECC009 | Personality Development | 2 |
| 2018ECC010 | Technical Writing | 2 |
| 2018ECC011 | An Introduction To Psychology | 2 |
| 2018ECC012 | Astronomy | 2 |
| 2018ECC013 | Fuzzy Mathematics | 2 |
| 2018ECC014 | Operation Research | 2 |
| 2018ECC015 | Mathematics For Professional Courses | 2 |
| 2018ECC016 | Multimedia And Its Applications | 2 |
| 2018ECC017 | Management Information System | 2 |
| 2018ECC018 | Theory Of Computation | 2 |
| 2018ECC019 | Oops With Java Programming | 2 |
| 2018ECC020 | Programming In C | 2 |
| 2018ECC021 | Internet Of Things | 2 |
| 2018ECC022 | Web Technology And Its Applications | 2 |
| 2018ECC023 | Network Security | 2 |
| 2018ECC024 | Mobile And Wireless Technology | 2 |
| 2018ECC025 | Cloud Computing | 2 |
| 2018ECC026 | Cross Culture Management | 2 |
| 2018ECC027 | Indian Economy And Trade Dependencies | 2 |
| 2018ECC028 | Export Marketing | 2 |
| 2018ECC029 | International Trade & Forex | 2 |
| 2018ECC030 | Brand Management | 2 |
| 2018ECC031 | Stress Management | 2 |
| 2018ECC032 | Risk And Insurance In International Trade | 2 |
| 2018ECC033 | Retail Marketing | 2 |
| 2018ECC034 | Export And Import Procedures | 2 |
| 2018ECC035 | Logistics And Supplychain Management | 2 |
| 2018ECC036 | Quality Management | 2 |
| 2018ECC037 | Management Of Small And New Enterprises | 2 |

| | | |
|---|---|---|
| 2018ECC038 | Tourism Management | 2 |
| 2018ECC039 | Event Management | 2 |
| 2018ECC040 | Hospitality Management | 2 |
| 2018ECC041 | Consumer Behaviour | 2 |
| 2018ECC042 | Human Resource Management | 2 |
| 2018ECC043 | Principles And Practice Of Marketing Services | 2 |
| 2018ECC044 | Consumer Marketing | 2 |
| 2018ECC045 | Marketing Of Health Services | 2 |
| 2018ECC046 | International Banking | 2 |
| 2018ECC047 | E-Commerce | 2 |
| 2018ECC048 | International Accounting | 2 |
| 2018ECC049 | Corporate Social Responsibility And Governance | 2 |
| 2018ECC050 | Enterprise Resource Planning | 2 |

**Curriculum Structure**

| S.No | Course | No of Papers | Credits |
|---|---|---|---|
| 1 | Language 1 : Tamil/Hindi/Malayalam/French | 2 | 6 |
| 2 | Language 2 : English | 2 | 6 |
| 3 | Core | 22 | 80 |
| 4 | Allied | 4 | 16 |
| 5 | Elective | 4 | 12 |
| 6 | Value Based Education | 2 | 04 |
| 7 | Skill Based Subject | 6 | 12 |
| 8 | Non-Major Elective | 2 | 04 |
| 9 | Non Credit Course | 4 | - |
| **Total** | | | **140** |

## SEMESTER I

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U1TALT01 | Title : Language 1- Tamil – I | **Batch** | 2018-2021 |
| | | | **Semester** | 1 |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**நோக்கம்**

- சமூகம் பற்றிய சிந்தனைகளைத் தமிழ்ப் படைப்பிலக்கியங்கள் மூலம் ஏற்படுத்துதல்
- புதுக்கவிதைகள் , சிறுகதைகள் ஆகியவற்றைப் படிக்க வைத்தல்/எழுத வைத்தல்
- போட்டித் தேர்வுகளுக்கு மாணவர்களைத் தயார் செய்தல்

**Course Outcome (CO)**

| CO Number | CO Statement |
|---|---|
| **CO1** | தமிழ் மொழியின் வாயிலாக பண்பாடு, பகுத்தறிவு, கலை மற்றும் மரபு முதலியவற்றை அறிந்து வாழ்க்கையில் பயனடைதல். |
| **CO2** | வாழ்வியல் நெறிமுறைகளை உணர்ந்து மனிதநேயத்துடனும் உயர்ந்த குறிக்கோளுடனும் சமுதாயத்தில் மதிக்கத்தக்கவர்களாக இருத்தல். |
| **CO3** | இலக்கியங்களின் வாயிலாக வாழ்க்கை முறைகளைத் தெரிந்து கொள்ளுதல். |
| **CO4** | அறத்தின் வழிநின்று பொருளீட்டி இன்பம் துய்ப்பது உன்னத வாழ்வின் அடிப்படை என்பதை திருக்குறள் மூலம் மாணவர்கள் உணர்தல். |
| **CO5** | நாட்டுப்பற்று, சமூகம், பெண்ணியம் குறித்த விழுமியங்கள் சார்ந்த கவிதைகளும், கருத்து பரிமாற்றத்திறனுக்கு அடிப்படையாக உள்ள இலக்கணப் பகுதியும், தன் சுய சிந்தனையுடன் படைப்பாக்கத்திறனை வளர்த்தெடுக்கும் வகையில் சிறுகதைப்பகுதியும் காலவோட்டத்துடன் இணைந்து மாணவர்களுக்கு சிந்திக்கும் ஆற்றலைப் பெற வழி வகை செய்தல். |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | ✓ | - | - | ✓ | - | - | ✓ | - |
| **CO2** | - | - | - | - | ✓ | - | - | ✓ | ✓ | - | ✓ | - |
| **CO3** | - | - | - | - | - | - | - | ✓ | - | - | ✓ | - |
| **CO4** | - | - | - | - | - | ✓ | - | ✓ | - | - | ✓ | - |
| **CO5** | ✓ | ✓ | - | - | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - |

**பாடத்திட்டம்**

**அலகு – 1 செய்யுள் திரட்டு : மரபுக் கவிதைகள் (15 மணிநேரம்)**

1. பாரதியார் - யோகசித்தி (பாரதியார் கவிதைகள்)
2. பாரதிதாசன் - தமிழனுக்கு வீழ்ச்சியில்லை (பாரதிதாசன் கவிதைகள்)
3. கவிமணி - கவிதை (மலரும் மாலையும்)
4. கண்ணதாசன் - ஆதியிலே வார்த்தை இருந்தார் (இயேசு காவியம்)

**அலகு – 2 செய்யுள் திரட்டு : புதுக் கவிதைகள் (13 மணிநேரம்)**

1. புவியரசு - கதாநாயகி (ஒரு முக்கிய அறிவிப்பு)
2. அப்துல் ரகுமான் - தவறான எண் (ஆலாபனை)
3. வைரமுத்து - உன் ஆன்மீகத்தின் அர்த்தம் (கவிராஜன் கதை)
4. சிற்பி பாலசுப்பிரமணியம் - கொடும்பாவி சாகாளோ (ஒரு கிராமத்து நதி)
5. கலாப்பிரியா - உயிர்த்தெழுதல் (கலாப்பிரியா கவிதைகள்)
6. இளம்பிறை - அசதி (முதல் மனிஷி)

**அலகு – 3 சிறுகதைத் தொகுப்பு (20 மணிநேரம்)**

1. புதுமைப்பித்தன் - பொன்னகரம் (புதுமைப்பித்தன் சிறுகதைகள்)
2. ஆ.மாதவன் - சுசிலாவின் கதை (ஆ.மாதவன் கதைகள்)

3. ஜெயகாந்தன் - தேவன் வருவாரா? (தேவன் வருவாரா?)
4. சுஜாதா - தர்மு மாமா (விஞ்ஞானச் சிறுகதைகள்)
5. அசோகமித்திரன் - அப்பாவின் சிநேகிதர் (அப்பாவின் சிநேகிதர்)
6. வண்ணதாசன் - ஆலங்கட்டிமழை (வண்ணதாசன் கதைகள்)
7. நாஞ்சில் நாடன் - சூடிய பூ சூடற்க (சூடிய பூ சூடற்க)
8. எஸ்.இராமகிருஷ்ணன் - தெரிந்தவர்கள் (எஸ்.இராமகிருஷ்ணன் கதைகள்)
9. வண்ணநிலவன் - இரண்டாவது சொர்க்கம்(வண்ணநிலவன் கதைகள்)
10. அம்பை - பிளாஸ்டிக் டப்பாவில் பராசக்தி முதலியோர் (காட்டில் ஒரு மான்)

**அலகு – 4 தமிழ் இலக்கிய வரலாறு (15 மணிநேரம்)**

- **தமிழ்நாடு அரசுப் பணியாளர் தேர்வாணையம் நடத்தும் போட்டித் தேர்வுக்குரிய பொதுத் தமிழ்ப் பாடத்திட்டம் - ஓர் அறிமுகம்**

1. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்
2. சிறுகதையின் தோற்றமும் வளர்ச்சியும்
3. புகழ்பெற்ற தமிழ் நூல்கள், நூலாசிரியர்கள் (சிறுகதை, புதுக்கவிதை) (பார்வை நூல்: தமிழ் இலக்கிய வரலாறு)
4. அடைமொழியால் குறிக்கப்பெறும் நூல்கள் , நூலாசிரியர்கள் (பார்வை நூல்: தமிழ் இலக்கிய வரலாறு)
5. ஆங்கிலச் சொல்லிற்கு இணையான தமிழ்ச் சொல் (பார்வை நூல்: நற்றமிழ் இலக்கணம்)

**அலகு – 5 இலக்கணம் (12 மணிநேரம்)**

1. வேர்ச்சொல் அறிதல் , அகர வரிசைப்படி சொற்களை மாற்றியமைத்தல்.
2. செய்வினை, செயப்பாட்டுவினை, உடன்பாடு, எதிர்மறை, கலவை வாக்கியங்களும் வாக்கிய வகைகளும்.
3. பெயர் , வினை, இடை, உரிச்சொற்கள்.
4. லகர-ளகர-ழகர, ணகர-னகர – வேறுபாடுகள்.

**TEXT BOOKS**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | தமிழ்த்துறை | பொதுத்தமிழ் - I (செய்யுள் திரட்டு , சிறுகதைத் தொகுப்பு) | கோவை கலைமகள் கலை அறிவியல் கல்லூரி |

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | புலவர் வெற்றியழகன் (தொ.ஆ), | பாரதியார் கவிதைகள் | ராமையா பதிப்பகம், சென்னை. |
| 2 | தொ.பரமசிவன்(ப.ஆ) | பாரதிதாசன் கவிதைகள் | நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை. |
| 3 | வித்துவான் சிவ கன்னியப்பன் | மலரும் மாலையும் | பூம்புகார் பதிப்பகம், சென்னை. |
| 4 | கவியரசு கண்ணதாசன் | இயேசு காவியம் | கலைக்காவிரி பதிப்பகம், திருச்சி. |
| 5 | புவியரசு | ஒரு முக்கிய அறிவிப்பு | விஜயா பதிப்பகம், கோவை. |
| 6 | அப்துல் ரகுமான் | ஆலாபனை | நேசனல் பப்ளிஷர்ஸ், சென்னை. |
| 7 | வைரமுத்து | கவிராஜன் கதை | திருமகள் பதிப்பகம், சென்னை. |
| 8 | சிற்பி | ஒரு கிராமத்து நதி | கவிதா பதிப்பகம் சென்னை. |
| 9 | கலாப்பிரியா | கலாப்பிரியா கவிதைகள் | தமிழினி பதிப்பகம், சென்னை. |
| 10 | இளம்பிறை | முதல் மனுஷி | தமிழ் நெஞ்சம், மயிலாடுதுரை. |

| | | | |
|---|---|---|---|
| 11 | சுஜாதா | விஞ்ஞானச் சிறுகதைகள் | உயிர்மை பதிப்பகம், சென்னை - 18. |
| 12 | புதுமைப்பித்தன் | புதுமைப்பித்தன் கதைகள் | பூம்புகார் பதிப்பகம், சென்னை. |
| 13 | மாதவன் | ஆ.மாதவன் கதைகள் | தமிழினி பதிப்பகம்,சென்னை. |
| 14 | ஜெயகாந்தன் | தேவன் வருவாரா | மீனாட்சி புத்தக நிலையம், மதுரை. |
| 15 | அசோகமித்திரன் | அப்பாவின் சிநேகிதர் | நர்மதா வெளியீடு, சென்னை. |
| 16 | வண்ணதாசன் | கனிவு | சந்தியா பதிப்பகம், சென்னை |
| 17 | நாஞ்சில் நாடன் | சூடிய பூ சூடற்க | தமிழினி பதிப்பகம், சென்னை |
| 18 | எஸ்.ராமகிருஷ்ணன் | எஸ்.ராமகிருஷ்ணன் கதைகள் | கிழக்கு பதிப்பகம், சென்னை. |
| 19 | வண்ணநிலவன் | வண்ணநிலவன் சிறுகதைகள் | நற்றிணை பதிப்பகம், சென்னை. |
| 20 | அம்பை | காட்டில் ஒரு மான் | காலச்சுவடு பதிப்பகம், சென்னை. |
| 21 | வல்லிக்கண்ணன் | புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் | அகரம் பதிப்பகம்,, கும்பகோணம். |
| 22 | கா.கோ.வெங்கட்ராமன் | தமிழ் இலக்கிய வரலாறு | கலையக வெளியீடு, திண்டுக்கல். |
| 23 | மது.ச.விமலானந்தம் | தமிழ் இலக்கிய வரலாறு | முல்லை நிலையம், சென்னை. |
| 24 | மு.பரமசிவம் | நற்றமிழ் இலக்கணம் | சைவசித்தாந்த பதிப்பகம், திருநெல்வேலி. |

**SEMESTER I**

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U1FRLT01 | Title : Language 1- French I | **Batch** | 2018-2021 |
| | | | **Semester** | 1 |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the students to understand the basic structure of French language.

**COURSE OUTCOMES (CO)**

In Successful Completion of the course the students will be able to

| CO Number | CO Statement |
|---|---|
| CO1 | have access to the works of great french writers. |
| CO2 | Develop the skills of speaking and writing without flaws. |
| CO3 | Help the learners to have a good critical thinking. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | - | - | - | ✓ | - | - | - | - | - | - |

**SYLLABUS**

Prescribed text : ALORS I

Units : 1–5

Authors : Marcella Di Giura
Jean-Claude Beacco

Available at : Goyal Publishers Pvt Ltd
86, University Block
Jawahar Nagar (Kamla Nagar)
New Delhi – 110007.
Tel : 011 – 23852986 / 9650597000

Question Paper Pattern : Semester I

(ALL QUESTIONS TO BE SET ONLY FROM THE PRESCRIBED TEXT)

Maximum Marks: 75 Time: 3 Hours.

**SECTION A (10)**

- CHOISISSEZ LA MEILLEURE RÉPONSE: (10X1=10)

**SECTION B (20)**

2. TRADUISEZ LES TEXTES SUIVANTS EN ANGLAIS:(4/5) (4X5=20)
(Pg Nos : 26 ex-6,44 ex-3,56 ex-4,74ex-4,80.)

**SECTION C (45)**

3. COMPRÉHENSION (8x1=8)
4. EXERCICES DE GRAMMAIRE:(5X5=25) (EITHER/OR)
5. FAITES DES PHRASES:(6/8) (6X1=6)
6. TRADUISEZ LES EXPRESSIONS EN ANGLAIS :(6/8) (6X1=6)

## SEMESTER I

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U1HILT01 | Title : Language 1- Hindi I | **Batch** | 2018-2021 |
| | | | **Semester** | 1 |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the students to understand the basic structure of Hindi language.

**COURSE OUTCOMES (CO)**

In Successful Completion of the course the students will be able to

| CO Number | CO Statement |
|---|---|
| CO1 | help the learners to communicate with others in any part of India with ease. |
| CO2 | Develop the skills of speaking and writing without flaws. |
| CO3 | Help the learners to have a good critical thinking. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | - | - | - | ✓ | - | - | - | - | - | - |

**SYLLABUS**

1. PROSE : NUTHAN GADYA SANGRAH

Editor: Jayaprakash
(Prescribed Lessons – only 6)
Lesson 1 – Bharthiya Sanskurthi
Lesson 3 - Razia
Lesson 4 – Makreal
Lesson 5- Bahtha Pani Nirmala
Lesson 6 – Rashtrapitha Mahathma Gandhi
Lesson 9 – Ninda Ras.
Publisher: Sumitra Prakashan
Sumitravas, 16/4 Hastings Road,
Allahabad – 211 001.

2. NON DETAILED TEXT: KAHANI KUNJ.

Editor: Dr.V.P.Amithab.
(Stories 1 -6 only)
Publisher : Govind Prakashan
Sadhar Bagaar, Mathura,
Uttar Pradesh – 281 001.

3. GRAMMAR : SHABDHA VICHAR ONLY

(NOUN,PRONOUN, ADJECTIVE, VERB, TENSE,CASE ENDINGS)

Theoretical & Applied.
Book for reference : Vyakaran Pradeep by Ramdev.
Publisher : Hindi Bhavan,
36,Tagore Town
Allahabad – 211 002.

4. TRANSLATION: English- Hindi only.

ANUVADH ABHYAS – III
(1-15 lessons Only)
Publisher: DAKSHIN BHARATH HINDI PRACHAR SABHA
CHENNAI -17.

5. COMPREHENSION : 1 Passage from ANUVADH ABHYAS – III (16- 30)
DAKSHIN BHARATH HINDI PRACHAR SABHA
CHENNAI- 17.

**SEMESTER I**

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U1MLLT01 | Title : Language 1- Malayalam I | **Batch** | 2018-2021 |
| | | | **Semester** | 1 |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the students to understand the basic structure of Malayalam language.

**COURSE OUTCOMES (CO)**

In Successful Completion of the course the students will be able to

| CO Number | CO Statement |
|---|---|
| CO1 | Help the learners to learn other Indian languages like Sanskrit,Tamil etc., through Malayalam without much effort. |
| CO2 | Develop the skills of speaking and writing without flaws. |
| CO3 | Help the learners to have a good critical thinking. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | - | - | - | ✓ | - | - | - | - | - | - |

**SYLLABUS**

**This paper will have the following five units:**

Unit I & II - Novel

Unit III & IV - Short story

Unit V - Composition & Translation

**Text books prescribed:**

Unit I & II - Naalukettu – M.T. Vasudevan Nair
(D. C. Books, Kottayam, Kerala)

Unit III & IV - Nalinakanthi – T.Padmanabhan
(D. C. Books, Kottayam, Kerala)

Unit V - Expansion of ideas, General Essay and Translation of a simple passage from English about 100 words) to Malayalam

**Reference books:**

1. Kavitha Sahithya Charitram –Dr. M. Leelavathi (Kerala Sahithya Academy, Trichur)

2. Malayala Novel Sahithya Charitram – K. M.Tharakan (N.B.S. Kottayam)

3. Malayala Nataka Sahithya Charitram – G. Sankarapillai (D.C. Books, Kottayam)

4. Cherukatha Innale Innu – M. Achuyuthan (D.C. Books, Kottayam)

5. Sahithya Charitram Prasthanangalilude - Dr. K .M. George, (Chief Editor) (D.C. Books, Kottayam)

## SEMESTER-I

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U1ENLT01 | Title : Language 2- Functional English – I | **Batch** | 2018-2021 |
| | | | **Semester** | 1 |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**COURSE OBJECTIVES:**

To enable the students to understand the basic English grammar.

**COURSE OUTCOMES (CO)**:

In Successful Completion of the course the students will be able to

| **CO Number** | **CO Statement** |
|---|---|
| **CO1** | Develop an interest in the minds of the students to enjoy and appreciate the literary works in English. |
| **CO2** | Develop the skills of speaking and writing without flaws. |
| **CO3** | Help the learners to have a good critical thinking. |

**MAPPING WITH PROGRAMME OUTCOMES**

| **CO/PO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | - | - | - | ✓ | - | - | - | - | - | - |

**SYLLABUS**

**UNIT –I – POETRY** **(12 Hours )**

1. On His Blindness- John Milton
2. Menelaus and Helen- Rupert Brooke
3. The Solitary Reaper- William Wordsworth

**UNIT- II- PROSE** **(12 Hours )**

1. Sweets for Angels- R.K.Narayan
2. The Post Master- Rabindranath Tagore
3. The Golden Touch- Nathaniel Hawthorne

**UNIT- III- GRAMMAR AND VOCABULARY** **(18 Hours )**

1. Subject Verb agreement
2. Articles, Preposition
3. Words Often Confused
4. Synonyms and Antonyms

5. Homophones

**UNIT-IV- VERBAL APTITUDE** **(18 Hours )**

1. Cloze Test
2. Phrasal Verbs
3. One Word Substitutes
4. Eponyms

**UNIT- V- DIALOGUE WRITING (CONVERSATION EXERCISES)** **(15 Hours )**

Greeting , Introducing , Requesting, Inviting & Congratulating

**TEXT BOOKS:**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | A.G.Xavier | An Anthology of Popular Essays and Poems | Macmillan Indian Limited |
| 2 | Prof. A.E.Subramanian | Gifts to Posterity- An Anthology of Modern Short Stories | Chitra Publications, Chennai |

**REFERENCE BOOKS:**

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | N.Krishnaswamy | Modern English- A Book of Grammar Usage and Composition | Macmillan Indian Limited |
| 2 | Prof.K.Ramappa, Retd. | Essential English Grammar Usage & Composition | M. I. Publications |

**Means of Curriculam Delivery:** Lecture, Group Learning, Seminar, Assignment, Google Classroom.

## SEMESTER I

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U1MCCT01 | Title : Core 1 - Calculus | **Batch** | 2018-2021 |
| | | | **Semester** | I |
| **Hours/week** | 6 Hours. | | **Credits** | 4 |

### COURSE OBJECTIVES

To enable the Students

- To gain knowledge about Envelope, Curvature and Evolute of Curve
- To apply integral Calculus in Solving problems
- To understand the concept of Proper and improper integrals

### COURSE OUTCOMES (CO)

On successful completion of the course, students will be able to

| CO Number | CO Statement |
|---|---|
| **CO1** | Define curvature, radius of curvature and methods of finding envelope of a curve. |
| **CO2** | Find the radius of curvature and derive pedal equation of a curve. |
| **CO3** | Evaluate special integrals. |
| **CO4** | Apply double integrals to find the area of a curve and evaluation of triple integrals. |
| **CO5** | Derive beta and gamma functions and evaluate of multiple integrals using beta and gamma functions and jacobian. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO4** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO5** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(15 Hours )**

Envelopes - Metheod of finding the Envelope- Curvature – Circle, Radius and Center of curvature –The Co-ordinates of the Center of Curvature.

**UNIT II** **(15Hours)**

Evolute and Involute – Radius of Curvature when the curve is given in Polar Co-ordinates - Pedal equation of curves – Chord of Curvature.

**UNIT III** **(15 Hours)**

Evaluation of integrals of the form $\int\left[\frac{f'(x)}{f(x)}\right]dx$ , $\int\left[\frac{px+q}{\sqrt{ax^2+bx+c}}\right]dx$ , $\int\sqrt{\frac{(x-a)}{b-x}}dx$ , $\int\sqrt{(x-a)(x-b)}\,dx$ , $\int\left[\frac{1}{acosx+bsinx+c}\right]dx$ , $\int\left[\frac{1}{acos^2x+bsin^2x+c}\right]dx$ , Integration by Parts-Reduction Formulae for $\int sin^n x\,dx$ , $\int cos^n x\,dx$ -Evaluation of $\int sin^m x cos^n x\,dx$ - Evaluation of $\int e^{ax}cosbx\,dx$ , $\int e^{ax}sinbx\,dx$ .

**UNIT IV** **(15 Hours)**

Multiple Integrals – Definition – Evaluation of Double integrals in Cartesian, polar coordinates - Change of order of integration – Application of Double integral to calculate area under curves - Triple integrals.

**UNIT V** **(15 Hours)**

Beta and Gamma functions – Definition – properties - Relation between Beta and Gamma functions.Jacobians – Definition – properties(without proof)- Jacobians for standard transformations- Evaluation of Double integrals and Triple integrals using Jacobians, Beta and Gamma functions.

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | S. Narayanan and T.K.M. Pillai | Calculus vol 1 and vol 2 | Viswanathan Publishers |

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | P.Kandasamy, K.Thilagarathy | Mathematics for BSc– Vol I and II | S.Chand and Co |
| 2 | Shanthi Narayanan & J.N.Kapoor | A Text book of Calculus | S.Chand & Co |
| 3 | N.Piskunov | Differential &Integral Calculus - Vol II | CBS publisher's |
| 4 | Dr.P.R.Vittal & V.Malini | Calculus | Margham publications |

**WEBSITE REFERENCE**

1. www.sakshieducation.com/engg/../M1_curvature
2. https://mathinsight.org/double_integral_introduction
3. https://mathinsight.org/double_integral_examples

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER I

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U1MCCT02 | Title : Core 2 -Algebra and Trigonometry | **Batch** | 2018-2021 |
| | | | **Semester** | I |
| **Hours/week** | 6 Hours. | | **Credits** | 4 |

### COURSE OBJECTIVES

To enable the Students

- To gain knowledge about Summation of series using Binomial, Exponential theorem.
- To get expose with theory of Equations and its applications
- To Expand Trigonometrical functions and to acquire knowledge about logarithmic functions

### COURSE OUTCOMES (CO)

On successful completion of the course, students will be able to

| CO Number | CO Statement |
|---|---|
| **CO1** | Apply the binomial theorem, exponential theorem and logarithmic theorem to summation of series |
| **CO2** | Explain the theory of equations and transformation of equations |
| **CO3** | Apply the Rolle's Theorem and Horner's Method to find the root of the equation |
| **CO4** | Explain how to expand trigonometric functions and separate real and imaginary parts |
| **CO5** | Find the logarithm of complex numbers |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | - | - | ✓ | ✓ | - | - | - | - | ✓ |
| **CO2** | - | ✓ | ✓ | - | - | ✓ | ✓ | - | - | - | - | ✓ |
| **CO3** | - | ✓ | ✓ | - | - | ✓ | ✓ | - | - | - | - | ✓ |
| **CO4** | - | ✓ | ✓ | - | - | ✓ | ✓ | - | - | - | - | ✓ |
| **CO5** | - | ✓ | ✓ | - | - | ✓ | ✓ | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(15Hours)**

Binomial Theorem(statements only)-Application to summation only-Exponentional Theorem (statements only)- Application to summation only-Logarithmic series- Application to summation only.

**UNIT II** **(15Hours)**

Theory of Equations:Relation between roots and coefficients -Problems-Transformation of Equation:dimishing or increasing roots of an equation by h-problems-Reciprocals equations-Problems.

**UNIT III** **(15Hours)**

Descartes' Rule of signs-Rolle's Theorem-Multiple Roots-Nature of roots of f(x)=0 -Horner's method to find a positive root or negative root approximately.

**UNIT IV** **(15 Hours)**

Expansion of Cosnθ, Sinnθ, $Cos^n\theta$ and $Sin^n\theta$ in powers of sinθ and cosθ- Separation of real and imaginary parts of Sin(α+iβ),cos(α+iβ),Tan(α+iβ).

**UNIT V** **(15 Hours)**

Logarithm of a complex numbers-Summation of Trigonometric Series.

**TEXT BOOKS**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | T.K. Manicavachagam Pillai, T. Natarajan and K.S Ganapathy | Algebra | Viswanatham Printers & Publishers |
| 2 | S.Narayanan and T.K.Manickavasagam Pillay | Trigonomentry for B.Sc Mathematics (Major) | S.Viswanathan Publishers |

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | P. Kandasamy and K. Thilagavathy | Mathematics for B.Sc. Branch I -Vol. I | S. Chand and Company Ltd |
| 2 | A.Singaravelu & R.Rama | Algebra and Trigonometry -I | Meenakshi agency |
| 3 | P.R.Vittal | Trigonometry | Margham Publications |

**WEBSITE REFERENCE**

1. https://www.mathplanet.com/education/algebra-2/sequences-and-series/binomial-theorem
2. https://oregonstate.edu/instruct/mth251/cq/Stage7/Lesson/rolles.html
3. https://www.physicsforums.com/threads/finding-the-sum-of-a-trigonometric-series.682019/

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER I

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U1MCAT01 | Title : Allied 1 - Mathematical Statistics - I | **Batch** | 2018-2021 |
| | | | **Semester** | I |
| **Hours/week** | 7 Hours. | | **Credits** | 4 |

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### COURSE OBJECTIVES

To enable the students

- To understand concepts of probability and Random variable
- To learn about Discrete and Continuous probability distributions
- To gain knowledge about Correlation and Regression Analysis
- 

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO Number | CO Statement |
|---|---|
| **CO1** | Define the basic concepts of Probability and its applications. |
| **CO2** | Explain the types of random variables, Distribution functions and Mathematical Expectation |
| **CO3** | Derive the Moment Generating functions and Characteristic functions of various distributions |
| **CO4** | Determine the constants of various distributions and the fitting of various probability distributions |
| **CO5** | Calculate the correlation coefficient and form the regression between the variables and interpret them |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO4** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO5** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(17 Hours)**

Theory of probability - Classical and axiomatic definition of probability-Addition and Multiplication theorems-Independent events-Theorems on Independent events-Definition of conditional probability-Problems-Baye's theorem-Theorem of total probability.

**UNIT II** **(17 Hours)**

Random Variables – Independence of random variables - Discrete and Continuous Random variables. Distribution Function: Properties – Probability Mass Function – Probability Density Function. Mathematical Expectation: Addition and Multiplication Theorems on Expectations.

**UNIT III** **(17 Hours)**

Moment Generating and Characteristic Functions and their Properties- Joint Probability Distributions – Marginal and Conditional probability distributions – Independence of random variables – Tchebychev's Inequality – Weak Law of Large Numbers.

**UNIT IV** **(17 Hours)**

Probability Distributions - Binomial – Poisson – Normal Distributions and their properties – Fitting of distributions - Chi-square, t, and F Statistics, their probability functions and their properties.

**UNIT V** **(17 Hours)**

Curve Fitting and Principle of least squares - Fitting of curves of straight line, second-degree parabola, power curve and exponential curves. Correlation and Regression Analysis.

*** Questions in problems and theory carry 80% and 20% respectively**.

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Gupta, S.C. & Kapoor. V.K | Elements of Mathematical Statistics | Sultan Chand & Sons |

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Gupta, C.B and Vijay Gupta | Introduction to Statistical Methods | Vikas Publications |
| 2 | Gupta, S.C. & Kapoor. V.K | Fundamentals of Mathematical Statistics | Sultan Chand and Sons |
| 3 | D.C.Sanchetti, V.K. Kapoor | Statistics | Sultan Chand and Sons |
| 4 | R.S.N. Pillai, V. Bagavathi | Statistics | S. Chand and Co |

**WEBSITE REFERENCE**

1.https://en.wikibooks.org/wiki/Statistics
2.https://www.khanacademy.org/math/statistics-probability

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER - I

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U1VBET01 | Title : Value Based Education 1 - Environmental Studies | **Batch** | 2018-2021 |
| | | | **Semester** | I |
| **Hours/week** | 2 Hours. | | **Credits** | 2 |

**COURSE OBJECTIVES:**

- To make the students understand the various types of natural resources and their responsibility in the conservation of the same.
- To impart on various eco systems, biodiversity at various levels and their conservation
- To make the students know on various types of environmental pollution, their causes , effects, their prevention and the students role in the same.

**COURSE OUTCOMES (CO):**

In Successful Completion of the course the students will be able to

| CO Number | CO Statement |
|---|---|
| **CO1** | Understand the interdisciplinary nature of environmental issues. |
| **CO2** | Understand the core concepts and methods from ecological and physical sciences and their application in environmental problem solving. |
| **CO3** | Develop a sense of community responsibility by becoming aware of scientific issues in the larger social context. |
| **CO4** | Develop the sense on ethical, cross cultural and historical context of environmental issues and the links between human and natural systems. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | - | - | - | - | - | ✓ | - |
| **CO2** | - | - | - | - | - | - | - | - | - | ✓ | ✓ | - |
| **CO3** | - | - | - | - | - | - | - | ✓ | - | - | ✓ | - |
| **CO4** | - | - | - | - | - | - | - | ✓ | - | - | ✓ | - |

**SYLLABUS**

**UNIT I** **(6 Hours)**

**The Multidisciplinary Nature of Environmental Studies** - Definition, Scope and Importance; Need for public awareness, Natural resources - Forest resources, Mineral resources, Food resources, Energy resources and Land resources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable life style.

**UNIT II** **(6 Hours)**

**Ecosystems** - Concept of ecosystem, Structure and Functions of an ecosystem. Producer, Consumer, Decomposers, Energy flow in ecosystem, Ecological succession, food chain, food webs and ecological pyramids. Introduction, types, characteristics, features, structure and functions of forest ecosystem, grass land, desert and Aquatic Ecosystems (ponds, streams, lakes, rivers, oceans and estuaries).

**UNIT III** **(6 Hours)**

**Biodiversity and its Conservation –** Introduction - Definitions: Genetic, Species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at Global, National and local levels. India as a mega-biodiversity nation. Hot spots of biodiversity. Threads of biodiversity: habitat loss, poaching of wild life. Man wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity-insitu and Exsitu conservation of biodiversity.

**UNIT IV** **(6 Hours)**

**Environmental Pollution** - Definitions, causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution and Thermal pollution. Solid waste management: causes, effects and control measures of Urban and Industrial wastes. Role of an individual in prevention of pollution. Pollutions case studies. Disaster management: Foods, Earthquake, Cyclone and Landslides.

**UNIT V** **(6 Hours)**

**Social issues and the Environment** - Sustainable development, urban problems related to energy, water conservation, rain water harvesting, water shed management. Resettlement and rehabilitation of people. Environmental ethics: issues and possible solution. Climate change, global warming, ocean layer depletion, acid rain, nuclear accident and holocaust, case studies. Consumerism and waste product. Environmental protection Act. Air (prevention and control of pollution) Act. Wild life protection act. Forest conservation Act. Issues involved in enforcement of environmental legislation. Public awareness. Human population and the environment.

**TEXT BOOKS:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Prof.R. Ranganathan | Environmental Studies. | Bharathiar University Publications |

**REFERENCE BOOKS:**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Ritu Bir | Environmental Studies | Vayu Education of India |
| 2 | Erach Bharucha | Textbook for Environmental Studies | University Press India Pvt. Ltd |
| 3 | Anubha Kaushik & C.P.Kaushik | Perspectives in Environmental Studies | New Age International Publishers |

**Means of Curriculam Delivery:** Lecture, Group Learning, Seminar, Assignment, Google Classroom.

## SEMESTER I

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U1SBST01 | Title : Skill Based Subject 1 - Mathematics For Competitive Examinations - I | **Batch** | 2018-2021 |
| | | | **Semester** | I |
| **Hours/week** | 2 Hours. | | **Credits** | 2 |

### COURSE OBJECTIVES

To enable the Students

- To understand the fundamental arithmetic skills and problem solving.
- To learn about the average and Problems on numbers.
- To solve problem related to Ages and Calander and Clocks.
-

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO Number | CO Statement |
|---|---|
| **CO1** | Recall the basic concepts of numerical computation. |
| **CO2** | Solve problems on ages, races and games of skills, stocks and shares. |
| **CO3** | Find solution to the problems on calender and clocks. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |

### SYLLABUS

**UNIT I** **(6 Hours)**

Numbers – H.C.F and L.C.M of Numbers – Decimal Fractions – Simplification

**UNIT II** **(6 Hours)**

Square Roots and Cube Roots – Average - Problems on Numbers

**UNIT III** **(6 Hours)**

Problems on Ages - Surds and Indices-Percentage

**UNIT IV** **(6 Hours)**

Races and games of skill – Calendar

**UNIT V** **(6 Hours)**

Clocks – Stocks and shares (Simple Problems only)

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | R. S. Agarwal | Quantitative Aptitude (for Competitive Examinations) | S. Chand and Company Limited |

- 

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | R.V.Praveen | Quantitative Aptitude and Resoning, | PHI Learning pvt. Ltd |
| 2 | Abhijit Guha | Quantitative Aptitude for Competitive Examinations | Tata Mc-Graw Hill Publishing Company |

**WEBSITE REFERENCE**

*1.*https://www.careerbless.com/aptitude/qa/home.php
*2.*https://www.indiabix.com/

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER II

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U2TALT02 | Title : Language 1-Tamil - II | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**நோக்கம்**

- சங்க இலக்கியத்தின் மாண்பு, இலக்கிய நயம், நீதி நெறிகள், பக்தியின் தன்மை, சங்ககால இலக்கண நெறிகள் ஆகியவற்றை அறிந்து கொள்ளுதல்
- வாழ்க்கையை வாழும் நெறிமுறைகள், வெற்றிக்கான உத்திகள், தமிழ் வளர்ச்சிக்கான நமது கடமைகள் ஆகியன குறித்து தெளிவு பெறுதல்

### Course Outcome (CO)

| CO Number | CO Statement |
|---|---|
| **CO1** | தமிழ் மொழியின் வாயிலாக பண்பாடு, பகுத்தறிவு, கலை மற்றும் மரபு முதலியவற்றை அறிந்து வாழ்க்கையில் பயனடைதல். |
| **CO2** | வாழ்வியல் நெறிமுறைகளை உணர்ந்து மனிதநேயத்துடனும் உயர்ந்த குறிக்கோளுடனும் சமுதாயத்தில் மதிக்கத்தக்கவர்களாக இருத்தல். |
| **CO3** | இலக்கியங்களின் வாயிலாக வாழ்க்கை முறைகளைத் தெரிந்து கொள்ளுதல். |
| **CO4** | அறத்தின் வழிநின்று பொருளீட்டி இன்பம் துய்ப்பது உன்னத வாழ்வின் அடிப்படை என்பதை திருக்குறள் மூலம் மாணவர்கள் உணர்தல். |
| **CO5** | நாட்டுப்பற்று, சமூகம், பெண்ணியம் குறித்த விழுமியங்கள் சார்ந்த கவிதைகளும், கருத்து பரிமாற்றத்திறனுக்கு அடிப்படையாக உள்ள இலக்கணப் பகுதியும், தன் சுய சிந்தனையுடன் படைப்பாக்கத்திறனை வளர்த்தெடுக்கும் வகையில் சிறுகதைப்பகுதியும் காலவோட்டத்துடன் இணைந்து மாணவர்களுக்கு சிந்திக்கும் ஆற்றலைப் பெற வழி வகை செய்தல். |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | ✓ | - | - | ✓ | - | - | ✓ | - |
| **CO2** | - | - | - | - | ✓ | - | - | ✓ | ✓ | - | ✓ | - |
| **CO3** | - | - | - | - | - | - | - | ✓ | - | - | ✓ | - |
| **CO4** | - | - | - | - | - | ✓ | - | ✓ | - | - | ✓ | - |
| **CO5** | ✓ | ✓ | - | - | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - |

**பாடத்திட்டம்**

**அலகு – 1 செய்யுள் திரட்டு : சங்க இலக்கியங்கள (20 மணிநேரம்)**

- 1. குறுந்தொகை - முதல் 5 பாடல்கள் (கடவுள் வாழ்த்து உட்பட)
- 2. நற்றிணை - பிரசங்கலந்த வெண்சுவைத்தீம்பால் (பா.எண்-110) , விளையாடு ஆயமோடு (பா.எண்-68)
- 3. கலித்தொகை - சுடர்த் தொடீஇ கேளாய் (பா.எண்-51)
- 4. புறநானூறு - ஆவுமானிய பார்ப்பன மாக்களும் (பா.எண்-9), காய்நெல் லறுத்துக் கவளம்கொளினே (பா.எண்-184)
- 5. பத்துப்பாட்டு - குறிஞ்சிப்பாட்டு முழுவதும்

**அலகு – 2 செய்யுள் திரட்டு : நீதி, பக்தி இலக்கியம் (15 மணிநேரம்)**

1. திருக்குறள் - அடக்கமுடைமை (அதிகாரம்-13), புறங்கூறாமை (அதிகாரம்-19)
2. நாலடியார் - கல்வி (அதிகாரம்-14), நல்லினம் சேருதல்(அதிகாரம்-18)
3. திருவெம்பாவை - முதல் 10 பாடல்கள்
4. நாச்சியார் திருமொழி - ஆறாம் திருமொழி

**அலகு – 3 உரைநடை: கட்டுரைத் தொகுப்பு (15 மணிநேரம்)**

1. இறையன்பு - கல்வியும் கடவுள் தன்மையும் (வாழ்க்கையே ஒரு வழிபாடு)
2. அகிலன் - பதினாறு பேறுகள் (வெற்றியின் ரகசியங்கள்)
3. முனைவர் பாஞ்.இராமலிங்கம் - மானிட உளவியல் (மானிட உளவியல்)
4. வ.செ.குழந்தைசாமி - தமிழ் வழிக்கல்வி-தயக்கங்கள், தடைகள் (தமிழ் வளர்ச்சி)
5. மணவை முஸ்தபா - தமிழுக்கு அறிவியல் அன்னியமா? (அறிவியல் நோக்கில் கம்பர்)
6. சுகி.சிவம் - வாழப்பழகுவோம் வாருங்கள் (வாழப்பழகுவோம் வாருங்கள்)
7. இரா. பிரேமா - பெண்ணியக் கோட்பாடுகளும் தமிழிலக்கிய ஆய்வில் அதன் தேவையும் பயனும் (பெண்ணியம் அணுகுமுறைகள்)

**அலகு – 4 இலக்கிய வரலாறு (15 மணிநேரம்)**

1. எட்டுத்தொகை, பத்துப்பாட்டு நூல்கள்
2. நீதி நூல்கள் - அறிமுகம்
3. நாயன்மார்கள் ஆழ்வார்கள் - அறிமுகம்
4. உரைநடையின் தோற்றமும் வளர்ச்சியும்

**அலகு – 5 இலக்கணமும் பயன்பாட்டுத் தமிழும் (10 மணிநேரம்)**

1. அகம், புறம் – திணை, துறை விளக்கங்கள்
2. முதல் , கரு, உரிப்பொருள்
3. மடல்கள், விண்ணப்பங்கள்
4. மொழிபெயர்ப்பு ( அலுவலகப் பகுதி, பொதுப்பகுதி)

**TEXT BOOKS**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | தமிழ்த்துறை | பொதுத்தமிழ் - II (செய்யுள் திரட்டு , கட்டுரைத் தொகுப்பு) | கோவை கலைமகள் கலை அறிவியல் கல்லூரி |

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | - | குறுந்தொகை | கழக வெளியீடு |
| 2 | புலவர் நா.இராமையாபிள்ளை (உ.ஆ) | நற்றிணை | வர்த்தமானன் பதிப்பகம், சென்னை. |
| 3 | - | கலித்தொகை, | கழக வெளியீடு |
| 4 | - | புறநானூறு, | கழக வெளியீடு |

| | | | |
|---|---|---|---|
| 5 | புலவர் அ.மாணிக்கனார் (உ.ஆ) | பத்துப்பாட்டு – II ஆம் தொகுதி | வர்த்தமானன் பதிப்பகம், சென்னை. |
| 6 | பேரா.அ.மாணிக்கம்(ப.ஆ) | நாலடியார் | மணிவாசகர் பதிப்பகம், சென்னை. |
| 7 | பேரா.அ.மாணிக்கம்(உ.ஆ) | பன்னிரு திருமுறைகள் (தொகுதி 11) | வர்த்தமானன் பதிப்பகம், சென்னை. |
| 8 | டாக்டர் கதிர்முருகு | நாச்சியார் திருமொழி | சாரதா பதிப்பகம், சென்னை. |
| 9 | வெ.இறையன்பு | வாழ்க்கையே ஒரு வழிபாடு | விஜயா பதிப்பகம், கோவை. |
| 10 | அகிலன் | வெற்றியின் ரகசியங்கள் | தாகம் பதிப்பகம், சென்னை. |
| 11 | முனைவர் பாஞ்.இராமலிங்கம் | மானிட உளவியல | சாரதா பதிப்பகம், சென்னை. |
| 12 | வ.செ.குழந்தைசாமி | தமிழ் வளர்ச்சி | பாரதி பதிப்பகம், சென்னை. |
| 13 | முணவை முஸ்தபா | அறிவியல் நோக்கில் கம்பர் | வானதி பதிப்பகம், சென்னை. |
| 14 | சுகி.சிவம் | வாழப்பழகுவோம் வாருங்கள் | வானதி பதிப்பகம், சென்னை. |
| 15 | இரா.பிரேமா | பெண்ணியம் அணுகுமுறைகள் | தமிழ்ப் புத்தகாலயம், சென்னை-17. |
| 16 | கா.கோ.வெங்கட்ராமன் | தமிழ் இலக்கிய வரலாறு | கலையக வெளியீடு, திண்டுக்கல். |
| 17 | மது.ச.விமலானந்தம் | தமிழ் இலக்கிய வரலாறு | முல்லை நிலையம், சென்னை |
| 18 | மு.பரமசிவம் | நற்றமிழ் இலக்கணம் | சைவசித்தாந்த பதிப்பகம், திருநெல்வேலி. |

## SEMESTER II

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U2FRLT02 | Title : Language 1-French II | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the students to understand the basic structure of French language.

**COURSE OUTCOMES (CO)**

In Successful Completion of the course the students will be able to

| CO Number | CO Statement |
|---|---|
| CO1 | have access to the works of great french writers. |
| CO2 | Develop the skills of speaking and writing without flaws. |
| CO3 | Help the learners to have a good critical thinking. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | - | - | - | ✓ | - | - | - | - | - | - |

**SYLLABUS**

Prescribed text : ALORS I

Units : 6 – 10

Authors : Marcella Di Giura
Jean-Claude Beacco

Available at : Goyal Publishers Pvt Ltd
86, University Block
Jawahar Nagar (Kamla Nagar)
New Delhi – 110007.
Tel : 011 – 23852986 / 9650597000

Question Paper Pattern : Semester II
(ALL QUESTIONS TO BE SET ONLY FROM THE PRESCRIBED TEXT)

Maximum Marks: 75 Time: 3 Hours.

SECTION A (10)

1. CHOISISSEZ LA MEILLEURE RÉPONSE: (10X1=10)

SECTION B (20)

2. TRADUISEZ LES TEXTES SUIVANTS EN ANGLAIS:(4/5) (4X5=20)
   (Pg Nos :86 ex-4,104 ex-3,116 ex-3a,b,134 ex-4,146 ex-2,162,163,164,165,166,167)

SECTION C (45)

3. COMPRÉHENSION (8x1=8)
4. EXERCICES DE GRAMMAIRE:(5X5=25) (EITHER/OR)
5. FAITES DES PHRASES:(6/8) (6X1=6)
6. TRADUISEZ LES EXPRESSIONS EN ANGLAIS :(6/8) (6X1=6)

## SEMESTER II

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U2HILT02 | Title : Language 1-Hindi II | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the students to understand the basic structure of Hindi language.

**COURSE OUTCOMES (CO)**

In Successful Completion of the course the students will be able to

| CO Number | CO Statement |
|---|---|
| CO1 | help the learners to communicate with others in any part of India with ease. |
| CO2 | Develop the skills of speaking and writing without flaws. |
| CO3 | Help the learners to have a good critical thinking. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | - | - | - | ✓ | - | - | - | - | - | - |

**SYLLABUS**

1. MODERN POETRY ; Draupadi by Narendra Sharma

PUBLISHER : Rajkamal Prakashan,
1B Nethaji Subash Marg,
New Delhi.

2. ONE ACT PLAY: EKANKÏ SANKALAN – Lesson ‘’Strike’ omitted

By Veerendra kumar mishra

PUBLISHER : VANI PRAKASHAM

NEW DELHI – 110 002.

3. TRANSLATION : HINDI – ENGLISH ONLY,

| | | |
|---|---|---|
| | | (ANUVADH ABYAS – III) |
| | | Lessons.1 – 15 only |
| PUBLISHER | : | DAKSHIN BHARATH HINDI PRACHAR SABHA |
| | | CHENNAI – 600 017. |
| 4. LETTER WRITING | : | (Leave letter, Job Application, Ordering books, |
| | | Letter to Publisher, Personal letter) |
| 5. CONVERSATION | : | (Doctor & Patient, Teacher & Student, Storekeeper & |
| | | Buyer, Two Friends, Booking clerk & Passenger at Railway |
| | | station, Autorickshaw driver and Passenger) |

Reference: Bolchal Ki Hindi Aur Sanchar by Dr. Madhu Dhavan, Vani Prakashan, New Delhi.

## SEMESTER II

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U2MLLT02 | Title : Language 1- Malayalam II | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the students to understand the basic structure of Malayalam language.

**COURSE OUTCOMES (CO)**

In Successful Completion of the course the students will be able to

| CO Number | CO Statement |
|---|---|
| CO1 | Help the learners to learn other Indian languages like Sanskrit,Tamil etc., through Malayalam without much effort. |
| CO2 | Develop the skills of speaking and writing without flaws. |
| CO3 | Help the learners to have a good critical thinking. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | - | - | - | ✓ | - | - | - | - | - | - |

**SYLLABUS**

Unit I & II - Biography

Unit III, IV & V - Smaranakal

**Text books prescribed:**

Unit I & II - Kanneerum Kinavum- V.T.Bhatahirippad (D.C. Books, Kottayam)

Unit III, IV & V - Balyakalasmaranakal – Madhavikkutty (D.C. Books, Kottayam)

**Reference books:**

1. Jeevacharitrasahithyam – Dr. K.M. George (N.B.S. Kottayam)
2. Jeevacharitrasahithyam Malayalathil – Dr. Naduvattom Gopalakrishnan (Kerala Bhasha Institute, Trivandrum)
3. Athmakathasahithyam Malayalathil – Dr. Vijayalam Jayakumar (N.B.S. Kottayam)
4. Sancharasahithyam Malayalathil – Prof. Ramesh chandran. V, (Kerala Bhasha Institute, Trivandrum)

## SEMESTER-II

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U2ENLT02 | Language 2-Functional English – II | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**COURSE OBJECTIVES:**

1. To enable the students to understand the basic English grammar.

**COURSE OUTCOMES (CO)**:

In Successful Completion of the course the students will be able to

| CO Number | CO Statement |
|---|---|
| **CO1** | Develop an interest in the minds of the students to enjoy and appreciate the literary works in English. |
| **CO2** | Develop the skills of speaking and writing without flaws. |
| **CO3** | Help the learners to have a good critical thinking. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | ✓ | - | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | - | - | - | ✓ | - | - | - | - | - | - |

**SYLLABUS**

**UNIT –I-POETRY** **(12 Hours)**

Stopping By Woods On a Snowy Evening – Robert Frost

The Ballad of Father Gilligan – William Butler Yeats

The Daffodils - William Wordsworth

**UNIT- II- PROSE** **(12 Hours)**

1. The Selfish Giant- Oscar Wilde
2. My lost Dollar- Stephen Butler Leacock
3. On The Rule of The Road- A.G. Gardiner

**UNIT- III- GRAMMAR AND VOCABULARY** **(18 Hours)**

1. Tenses
2. Transformation of Sentences
3. Describing a Simple Process, Paraphrasing
4. Homonyms
5. Word Blends

**UNIT-IV- VERBAL APTITUDE AND COMPOSITION (18 Hours)**

1. Common Errors
2. Reading Comprehension
3. Essay Writing
4. Letter Writing (Formal and In- Formal)

**UNIT- V- DIALOGUE WRITING (CONVERSATION EXERCISES ) (15 Hours)**

1. Suggestions , Sympathy, Complaining, Agreement & Apologising

**TEXT BOOKS:**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | A.G.Xavier | An Anthology of Popular Essays and Poems | Macmillan Indian Limited. |
| 2 | Prof. A.E.Subramanian | Gifts to Posterity- An Anthology of Modern Short Stories | Chitra Publications, Chennai. |

**REFERENCE BOOKS:**

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | N.Krishnaswamy | Modern English- A Book of Grammar Usage and Composition | Macmillan Indian Limited |
| 2 | Prof.K.Ramappa, Retd. | Essential English Grammar Usage & Composition | M. I. Publications |

**Means of Curriculam Delivery:** Lecture, Group Learning, Seminar, Assignment, Google Classroom.

## SEMESTER II

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U2MCCT03 | Title : Core 3 - Analytical Geometry of Three Dimensions | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 5 Hours | | **Credits** | 4 |

### COURSE OBJECTIVES

To enable the Students

- To understand about straight lines in three dimensional Geometry
- To have knowledge about Sphere, Cone and Cylinder and their applications
- To learn about conicoids in Solid Geometry

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to achieve the following outcomes.

| CO Number | CO Statement |
|---|---|
| **CO1** | Explain the concept of straight line, Coplanar lines and Shortest distance bewtween skew lines. |
| **CO2** | Determine the equation of a sphere, circle and the tangent plane at a given point. |
| **CO3** | Derive the equation of cone, right circular cone and solve the equauion of tangent plane and normal. |
| **CO4** | Determine the equation of a cyclinder and enveloping cylinder. |
| **CO5** | Apply the concepts of tangent and normal planes to the conicoids. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO4** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO5** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(12 Hours)**

The straight line: Symmetrical form of the equations of a line – Non- symmetrical form of the equations of a line – equation of a line passing through two points – Coplanar lines: Condition for the given two lines should be coplanar – Shortest distance between two skew lines.

**UNIT II** **(12 Hours)**

Sphere – Equations of a sphere when the centre and radius are given – The equation $x^2+y^2+z^2 + 2ux+2y+2wz+d=0$ always represents a sphere and to find its centre and radius – the length of the tangent from the point $(x_1,y_1,z_1)$to the sphere $x^2+y^2+z^2 + 2ux+2y+2wz+d=0$ Equation

of a sphere passing through a given circle – intersection of two spheres is a circle – the Equation of the tangent plane to the sphere $R^n$ at the point $R^n$

**UNIT III** **(12 Hours)**

Cone – Definition – Right Circular Cone – Definition – Derivation of Right circular cone- Intersection of a straight line and a quadric cone - Tangent plane and normal - Condiition for the plane lx+my+nz=0 to touch the quadric cone $ax^2+by^2+cz^2+2fyz+2gzx+2hxy=0$ - Angle between the lines in which the plane ux+vy+wz=0 cuts the cone - Condition that the cone has three mutually perpendicular generators.

**UNIT IV** **(12 Hours)**

Cylinder – Definition – Equation of the right circular cylinder with axis and radius of the guiding circle – Enveloping cylinder – equation of the enveloping cylinder of the surface $ax^2+by^2+cz^2=1$ having the generator parallel to $\frac{x}{l}=\frac{y}{m}=\frac{z}{n}$-simple problems.

**UNIT V** **(12 Hours)**

Central Quadrics: Definition and three cases – intersection of a line and quadrate – tangents and tangent plane – condition for the plane $lx+my+nz=p$to touch the conicoid $ax^2+by^2+cz^2=1$Normal at the point $(x_1,y_1,z_1)$to the conicoid $ax^2+by^2+cz^2=1$

**TEXT BOOK**

Recent editions of the following books only are recommended

| S.No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | T.Manicavachagam pillai , Natarajan | A text book of Analytical geomtry of 3D | S.Vishwanathan Pvt Ltd |

**REFERENCE BOOKS**

| S.No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | P.Duraipandian, Laxmi Duraipandian, D.Muhilan | Analytical Geometry 3 Dimensional | Emerald Publishers |
| 2 | P.Duraipandian and Kayalal Pachaiyappa | Analytical Geometry (3-D) | Muhil Publishers |
| 3 | M.L. Khanna | Solid Geometry | Jainath & Co Publishers |
| 4 | Shanthi Narayanan, P.K. Mittal | Analytical Solid Geometry | S.Chand&Co |

**WEBSITE REFERENCE**

1. https://www.scribd.com/document/29931462/3D-Analytical-Geometry
2. www.brainkart.com/article/Three-Dimensional-Analytical-Geometry_6453/

**Means of Curriculum Delivery:** Lecture, Group Learning, Seminar, Assignment, Google Classroom.

## SEMESTER II

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U2MCCT04 | Title : Core 4 - Programming in C | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 4 Hours. | | **Credits** | 4 |

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**COURSE OBJECTIVES**

To enable the students

- To know about the basics of C Programming and its various computation logics
- To clearly understand decision making and branching concepts with various statements
- To know about the concept of arrays, strings and functions with its various operations

**COURSE OUTCOMES (CO)**

On successful completion of the course, students should be able to

- 

| CO Number | • CO Statement |
|---|---|
| • **CO1** | Recogonize situations where computational methods and computers would be useful. |
| • **CO2** | Identify the loops and decision making statements in C programming to create structure of a program |
| • **CO3** | Classify functions to solve the given problem. |
| • **CO4** | Sketch user defined functions and class for user specified actions. |
| • **CO5** | Understand advanced use of arrays in C++ programming. |

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**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | - | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | - | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | - | - | ✓ |
| **CO4** | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | - | - | ✓ |
| **CO5** | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | - | - | ✓ |

**SYLLABUS**

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**UNIT I** **(10Hours)**

- Introduction –Structure of C programme - Character set -Constants –Token and Keywords and identifiers – Constants and Variables - Data types – Declaration of variables- Declaration of Storage class –Assigning values to variables –Defining symbolic constants.

**UNIT II** **(10 Hours)**

- Arithmetic operators - Relational operators - logical operators – assignment operators –increment and decrement operates –Conditional operators – Special operators –Arithmetic expressions – Evaluation of expressions –Precedence of arithmetic operators –Type conversion in expressions – operator precedence and associating mathematical functions.

**UNIT III** **(10 Hours)**

- Formatted input and output- Decision making with IF statement – Simple IF statement – The if ELSE statement - Nesting of IF…..ELSE statement – The ELSE IF ladder. The Switch statement – The Operator –The GOTO statement.

**UNIT IV** **(10 Hours)**

- The WHILE statement - the DO statement the FOR statement –Jumps in loops.One, Two dimensional arrays – Initiating two dimensional arrays – Multidimensional arrays –Declaring and initializing string variables –reading strings from terminal – Writing strings on the screen – Arithmetic operations on characters.

**UNIT V** **(10 Hours)**

- User defined function: Introduction-Need and Element of user defined function-Definition-Return value and their types-function call – Function declaration – category of functions- No arguments and no return values-Arguments but no return value- Arguments with return value- No argument but return value- Functions that return multiple values-Nesting of function-Recursion.

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | E.Balagurusamy | Programming in ANSI C | Tata McGraw –Hill Publishing company limited |

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | • Publisher |
|---|---|---|---|
| 1 | Byron Gottfried | Programming with C | Tata McGrawHill publishing company |
| 2 | Ashok N.Kamthane | Programming with Ansi and Turbo C | Pearson Education publishers |
| 3 | K.R.Venugopal and Sudeep R Prasad | Programming with C | Tata McGraw –Hill Publishing company limited |
| 4 | Yashavant Kanethkar | Let us C | BPB Publication |

**WEBSITE REFERENCE**

- 1. https://www.geeksforgeeks.org/c-language-set-1-introduction/
- 2. https://www.programiz.com/c-programming
- 3. https://en.wikipedia.org/wiki/C_%28programming_language%29\
- 4. https://fresh2refresh.com/c-programming/

**Means of Curriculum Delivery:** Lecture, Group Learning, Seminar, Assignment, Google Classroom.

**SEMESTER II**

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U2MCCP05 | Title : Core 5- Programming in C- Practical | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 3 Hours. | | **Credits** | 2 |

**COURSE OBJECTIVES**

To enable the students

- To enhance the students to learn field of C programming language with various techniques for enhance their analysis and problem solving techniques.
- To learn basic principles of objects, arrays and pointers for efficient implemenataion in real world problems.

**COURSE OUTCOMES (CO)**

On successful completion of this lab Course, student will be able to

| CO Number | Statement |
|---|---|
| **CO1** | Understand the basic structure of C programming for declaring and usage of variables. |
| **CO2** | Design an solution for given problem using time and memory complexity. |
| **CO3** | Choose the loop and decision making statements to solve given problem |
| **CO4** | Implementation of various file operations for a given application |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | - | - | - | ✓ | ✓ | - | ✓ | - | - | - |
| **CO2** | - | ✓ | - | - | - | ✓ | ✓ | - | ✓ | - | - | - |
| **CO3** | - | ✓ | - | - | - | ✓ | ✓ | - | ✓ | - | - | - |
| **CO4** | - | ✓ | - | - | - | ✓ | ✓ | - | ✓ | - | - | - |

**PROGRAM LIST**

1. Write a C program to generate ‘N’ Fibonacci number.
2. Write a C program to print all possible roots for a given quadratic equation.
3. Write a C program to calculate the statistical values of mean, median, mode, Standard Deviation and variance of the given data.
4. Write a C program to sort a set of numbers.
5. Write a C program to sort the given set of names.
6. Write a C program to find factorial value of a given number ‘N’ using recursive function call.
7. Write a C program to find the product of two given matrix.
8. Write a C program to prepare pay list for a given data.

**WEBSITE REFERENCE**

1. http://computer.howstuffworks.com/c.html
2. http://www.le.ac.uk/cc/tutorials/c/
3. http://www.cprogramming.com/tutorial.html
4. www.programiz.com/c-programming
5. https://www.coursera.org/course/cprogramming

**Means of Curriculum Delivery** : Power point presentation, Lab Assignments, Observation

## SEMESTER II

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U2MCAT02 | Title : Allied 2 - Mathematical Statistics - II | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 7 Hours. | | **Credits** | 4 |

**COURSE OBJECTIVES**

To enable the students

- To understand the theory of Sampling and the concept of Tests of Significance
- To learn the concepts of Theory of Estimation and Testing of Hypothesis
- To gain knowledge about ANOVA and Design of Experiments and their practical applications

**COURSE OUTCOMES (CO)**

On successful completion of the course, students should be able to

| CO Number | CO Statement |
|---|---|
| **CO1** | Explain the methods of sampling, concepts of test of significance and its applications |
| **CO2** | Explain the method of estimation and maximum likelihood estimator of various probability distributions |
| **CO3** | Apply the various tests of significance to practical problems |
| **CO4** | Explain optimum tests under different situations |
| **CO5** | Employ the concept of analysis of variance and design of experiments to practical situations |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO4** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO5** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |

**SYLLABUS**

**UNIT I** **(17 Hours)**

Sampling - Introduction – Types – Parameters and statistic – Test of Significance – Null Hypothesis – Errors in Sampling – Critical Region and Level of Significance – Tests of Significance for Large samples – Sampling of Attributes – Sampling of Variables – Unbiased Estimates for Population Mean and Variance – Standard Error of Sample Mean – Test of Significance for Single Mean – Tests of Significance for large and small samples with respect to mean and proportions – Test for association between attributes.

**UNIT II** **(17 Hours)**

Theory of Estimation - Introduction – Characteristics of Estimators – Consistency Unbiasedness – Efficient Estimators – Sufficiency - Methods of estimation – Maximum likelihood Ratio – Cramer Inequality.

**UNIT III** **(17 Hours)**

Test of Hypothesis - Introduction – Statistical Hypothesis – Simple and Composite – Steps in Solving Testing of Hypothesis problem – Optimum Test under Different Situations – Neyman J and Pearson, E.S.Lemma-Likelihood Ratio test-Test for the mean of a normal population-Test for the equality of means of two normal populations.

**UNIT IV** **(17 Hours)**

Sampling - Sampling from finite population – Simple Random Sampling – Stratified Random Sampling and Systematic Sampling – Estimation of Mean, Total and their standard errors. Sampling and Non - sampling errors (Concepts only).

**UNIT V** **(17Hours)**

Analysis of Variance - One way classifications – Two way classifications. Fundamental principles of experimentation : CRD – RBD and LSD.

*** Questions in problems and theory carry 80% and 20% respectively.**

**TEXT BOOKS**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Gupta, S.C. & Kapoor. V.K | Elements of Mathematical Statistics | Sultan Chand & Sons |
| 2 | Gupta, S.C. & Kapoor. V.K | Fundamentals of Mathematical Statistics | Sultan Chand and Sons |

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Gupta, C.B and Vijay Gupta | Introduction to Statistical Methods | Vikas Publications |
| 2 | Gupta, S.C. & Kapoor. V.K | Fundamentals of Applied Statistics | Sultan Chand and Sons |
| 3 | D.C.Sanchetti, V.K. Kapoor | Statistics | Sultan Chand and Sons |
| 4 | R.S.N. Pillai, V Bagavathi | Statistics | S. Chand and Co |

**WEBSITE REFERENCE**

1.https://en.wikibooks.org/wiki/Statistics
2.https://www.khanacademy.org/math/statistics-probability

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER II

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U2VBET02 | Title :Value Based Education II (அறவியலும் பண்பாடும்) | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 2 Hours. | | **Credits** | 2 |

Ethics and Culture (மனிதவள மாண்பு - தனிமனித விழுமியங்கள்,சமுதாய விழுமியங்கள்)

**நோக்கம்**

- ஒவ்வொருவரும் தன்னை உயர்த்திக் கொண்டு, சமுதாய மக்களுடன் இணக்கமாக வாழ்ந்து சமுதாயத்தையும் உயர்த்த வேண்டும். உன்னத இலட்சியத்திற்காக வாழ்ந்து நமது வாழ்க்கையை அர்த்தமுள்ளதாக ஆக்கிக் கொள்ள வேண்டும்.
- கவலைக்கு ஆதாரமான ஆசை மற்றும் சினம் ஆகியவற்றைத் தவிர்ப்பதன் மூலம் கவலையை ஒழிப்பதற்கான பயிற்சி பெறுதல்
- கல்வி, அரசியல், பொருளாதாரம் மற்றும் விஞ்ஞானம் ஆகியவற்றுக்கும் சமுதாயத்திற்கும் உள்ள தொடர்பினை அறிந்து கொள்ளுதல்

**Course Outcome (CO)**

| CO Number | CO Statement |
|---|---|
| **CO1** | தன்னை உள்நோக்க அறிவால் ஆராய்ந்து தன்னிடமுள்ள உணர்ச்சி வயப்பட்ட குணங்களை எல்லாம் மாற்றியமைத்துக் கொள்ளச் செய்தல். |
| **CO2** | தனி மனித ஒழுக்கங்களை அறிந்து, முறைப்படி வாழ்ந்து சமுதாயத்தில் தங்களை உயர்த்திக் கொள்ளச் செய்தல். |
| **CO3** | வாழ்க்கையின் இலக்கை அடையத் தேவையான தகுதியை வளர்த்துக் கொள்ளச் செய்தல். |
| **CO4** | சமுதாயத்தோடு இணக்கமாக வாழவும், சுயசிந்தனை, ஆற்றலை வளர்த்து பிரச்சினைகளுக்குத் தீர்வுகாணவும் வழி வகுத்தல். |
| **CO5** | போட்டிகள் நிறைந்த இவ்வுலகில் சமுதாயம், அரசியல், பொருளாதாரம் ஆகிய சூழல்களைத் துணிச்சலாக எதிர்கொள்ள தன்னம்பிக்கையை வழங்குதல். |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | ✓ | - | - | - | ✓ | - | - | ✓ |
| **CO2** | - | ✓ | - | - | ✓ | - | - | ✓ | ✓ | - | ✓ | - |
| **CO3** | - | - | - | - | ✓ | - | - | - | ✓ | - | - | |
| **CO4** | - | - | ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| **CO5** | - | - | - | - | ✓ | ✓ | - | ✓ | ✓ | - | - | - |

**பாடத்திட்டம்**

**அலகு – 1** **(5 மணிநேரம்)**

மனிதவள மாண்பின் அவசியம் - குறிக்கோள் , மதிப்புகள் - வாழ்வின் நோக்கமும் தத்துவமும் - வாழ்க்கைத் தேவைகள் , காப்புகள் - அறநெறிகள் , அறிவின் நிலைப்படிகள்.

**அலகு – 2** **(5 மணிநேரம்)**

எண்ணம் ஆராய்தல் - எண்ணம் எழக்காரணங்கள் - எண்ணம் ஆராய்தல் பயிற்சி – ஆசை சீரமைத்தல் - ஆசை சீரமைத்தல் பயிற்சி.

**அலகு – 3** **(5 மணிநேரம்)**

சினம் தவிர்த்தல் - சினத்தின் விளைவுகள் - சினம் தவிர்த்தல் பயிற்சி – கவலை ஒழித்தல் - கவலையின் வகைகளும் விளைவுகளும் - கவலை ஒழித்தலுக்கான பயிற்சி.

**அலகு – 4** **(8 மணிநேரம்)**

மனிதனின் பரிணாமம் - பிரபஞ்ச தன்மாற்றம் - உயிரினத் தன்மாற்றம் - ஆறாம் அறிவின் மேம்பாடு – மனித வேறுபாட்டிற்கான காரணங்கள் - ஏழு சம்பத்துகள் - பதினாறு காரணங்கள் - மனத் தூய்மை தரும் சமுதாய நலன்.

**அலகு – 5** **(7 மணிநேரம்)**

கல்வியும் சமுதாயமும் - கல்வியின் சமுதாய நோக்கங்கள் - கல்வியின் சமுதாயப் பணிகள் - அரசியலும் சமுதாயமும் - பொருளாதாரமும் சமுதாயமும் - விஞ்ஞானமும் சமுதாயமும்.

**TEXT BOOKS**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | - | தனிமனித விழுமியங்கள் | என்.ஜி.எம். கல்லூரி, பொள்ளாச்சி. |
| 2 | - | சமுதாய விழுமியங்கள் | என்.ஜி.எம். கல்லூரி, பொள்ளாச்சி. |

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | - | வாழ்வியல் விழுமியங்கள், | வேதாத்திரி பதிப்பகம் , ஈரோடு. |
| 2 | - | மனவளக்கலை யோகா | வேதாத்திரி பதிப்பகம் , ஈரோடு. |

## SEMESTER II

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U2SBST02 | Title : Skill Based Subject 2 - Mathematics for Competitive Examinations -II | **Batch** | 2018-2021 |
| | | | **Semester** | II |
| **Hours/week** | 2 Hours | | **Credits** | 2 |

### COURSE OBJECTIVES

To enable the Students

- To know about concept of Interest and Profit and loss.
- To develop the ability in solving Permutation, Combinations and Bankers Discount.
- To Solve Problems of Permutations and combinations.
-

### COURSE OUTCOMES

On successful completion of the course, students should be able to

| CO Number | CO Statement |
|---|---|
| **CO1** | Explain the basic concepts of mathematics of finance. |
| **CO2** | Solve the problems on time and distance, time and work. |
| **CO3** | Apply the concept of permutation and combinations to solve problem. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |

### SYLLABUS

**UNIT I** **(6Hours)**

Profit and Loss – Ratio and Proportion

**UNIT II** **(6Hours)**

Partnership – Chain Rule

**UNIT III** **(6Hours)**

Time and Distance – Time and work

**UNIT IV** **(6Hours)**

Permutation & Combinations

**UNIT V** **(6Hours)**

True Discount- Bankers Discount

(Simple Problems only)

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | R. S. Agarwal | Quantitative Aptitude (for Competitive Examinations) | S. Chand and Company Limited |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | R.V.Praveen | Quantitative Aptitude and Resoning | PHI Learning pvt. Ltd |
| 2 | Abhijit Guha | Quantitative Aptitude for Competitive Examinations | ata Mc-Graw Hill Publishing Company |

**WEBSITE REFERENCE**

*1.*https://www.careerbless.com/aptitude/qa/home.php
*2.*https://www.indiabix.com/

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER III

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U3MCCT06 | Title : Core 6 : Vector Calculus & Fourier Series | **Batch** | 2018-2021 |
| | | | **Semester** | III |
| **Hours/week** | 7 Hours | | **Credits** | 4 |

### COURSE OBJECTIVES

To enable the Students

- To understand the concept of vector Differentiation and Integration
- To make themselves clear of the concepts of line and surface Integrals.
- To gain knowledge about Fourier series and Half range Fourier series.
- To find a solution for multiple integrals by using Gauss divergence theorem, stoke's theorem and Green's theorem.
- To know about the concept of fourier coefficient.

### COURSE OUTCOME (CO)

On successful completion of the course, students should be able to achieve the following outcomes.

| CO NO | CO Statements |
|---|---|
| C01 | Calculate vector scalar and vector products and recognise irrotational, solenoidal vector fields. |
| C02 | Apply the concepts of Gradient, Divergence and curl to solve vector diiferentiation problems. |
| C03 | Understand the various theorems relating to line, surface and volume integral. |
| C04 | Solve the multiple integrals by applying Gauss divergence theorem, Stoke's theorem and Green's theorem. |
| C05 | Find the Fourier co-efficient for periodic functions. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | - | - | - | ✓ | ✓ | - | - | - | - | - | ✓ |
| **CO2** | - | ✓ | ✓ | - | - | - | - | - | - | - | ✓ | - |
| **CO3** | - | - | - | - | - | ✓ | - | - | ✓ | - | - | ✓ |
| **CO4** | ✓ | ✓ | - | - | - | ✓ | - | - | - | - | - | ✓ |
| **CO5** | - | ✓ | - | - | ✓ | ✓ | - | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(17 Hours)**

Definition of $\nabla$, $\nabla\phi$ – level surfaces-angle between level surfaces-Equation of normal line and tangent plane-Definition of divergence $\bar{f}$ -solenoidal vector-problems-Definition of curl F-irrotational vectors,related problems.

**UNIT II** **(17 Hours)**

Integration for vectors-Surface and Volume Integrals-related problems.

**UNIT III** **(17 Hours)**

Theorms of Gauss,Green,Stokes (Statements only)-Problems.

**UNIT IV** **(17 Hours)**

Fourier Series-Definition of periodic function- fourier series-Euler's formula for Finding Fourier coefficients-Dirichlet's conditions-Obtaining Fourier series of periodicity $2\pi$ for a function f(x).

**UNIT V** **(17 Hours)**

Half range Fourier Series-Development of f(x) as half-range sine and cosine series of period $2\pi$.

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Dr.P.R.Vittal,V.Malini & R.V.Praveen | Vector Analysis | Margham Publications |
| 2 | S.Narayanan,T.K.Manic kavachagom Pillai | Calculus volume-III (Differential Equations &Fourier Series and Fourier Transforms) | Viswanathan Printers |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | P.Kandasamy,K.Thilaga vathy | Mathematics,Volume IV(Vector calculus,Fourier series) | S.Chand&Company |
| 2 | Durai Pandian,Laxmi Durai Pandian | Vector Analysis | Emerald Publishers |
| 3 | Robert C.Wrede Murrray Spiegel | Advanced calculus | Tata Mc .Graw Hill |
| 4 | Dipak Chattergie | Vector Analysis | Prentice Hall of India |

**WEBSITE REFERENCE**

1. https://www.sakshieducation.com – CurvatureEvolutes & EnvelopesCurveTracing.pdf

2. https://www.maths.bath.ac.uk/~masrs/MA20010/chap1.pdf

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER III

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U3MCCT07 | Title : Core 7 :Statics | **Batch** | 2018-2021 |
| | | | **Semester** | III |
| **Hours/week** | 6 Hours | | **Credits** | 4 |

### COURSE OBJECTIVES

To enable the Students

- To understand nature of forces and resultant forces
- To make the student realize the concept of Parallel forces, Moments and Couples
- To know about the concepts of parallel force and moments.
- To gain knowledge about reduction of Coplanar forces and its applications
- To find equilibrium of three forces acting on a rigid body.

### COURSE OUTCOME (CO)

On successful completion of the course, students should be able to achieve the following outcomes.

| CO NO | CO Statements |
|---|---|
| C01 | Understand the basic priciples and to develop the ability to describe the position of forces and moments. |
| C02 | Apply the concepts of Lamis theorem and (λ,μ) theorem. |
| C03 | Apply the concepts of forces in finding the resultant of more than two force acting on a surface. |
| C04 | Analyze the basics of coplanar forces and equilibrium of forces acting on a rigid body and can solve the simple problems related to it. |
| C05 | Understand the basic concepts of theorems on moments and to find equilibrium of three forces acting on a rigid body. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | - | - | - | ✓ | - | - | ✓ | - | - | ✓ |
| **CO2** | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - | - | - | - |
| **CO3** | - | ✓ | ✓ | - | - | - | ✓ | - | - | - | - | - |
| **CO4** | - | ✓ | - | - | - | ✓ | - | - | - | - | - | ✓ |
| **CO5** | - | ✓ | - | - | - | ✓ | - | - | ✓ | - | - | ✓ |

### SYLLABUS

**UNIT I** **(15 Hours)**

Forces acting at a Point- Parallelogram law of forces (Statement and Proof)-Problems - Triangle law of forces (Statement and Proof)--Converse –Polygon law of forces.

**UNIT II** **(15 Hours)**

Lami's Theorem (Statement and Proof)- Problems- - (λ,μ) Theorem (Statement and Proof) - Problems- Resultant of any number of forces acting at a Point-Conditions of Equilibrium

**UNIT III** **(15 Hours)**

Parallel forces -Resultant of two like Parallel forces-Resultant of two unlike and unequal Parallel forces-Conditions of Equilibrium of three Coplanar forces- problems.
Moments- Couples-Equilibrium of two Couples- Resultant of a Couple and a force -Problems.

**UNIT IV** **(15 Hours)**

Varigon's Theorem of Moments-Generalised theorem on Moments-Problems-Equilibrium of three forces acting on rigid body- Three coplanar forces Theorem-problems

**UNIT V** **(15 Hours)**

Coplanar forces-Reduction of any number of Coplanar forces theorem(without Proof) – Conditions for a system of forces reduce to a single force or to a couple -Equation to the line of action of the resultant-problems

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | M.K.Venkataraman | Statics | Agasthiar Publications Trichy |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | A.V.Dharmapadam | Statics | S.Viswanathan printers and Publishing Ltd |
| 2 | .Duraipandian &Laxmi Duraipandian | P:Mechanics | S.Chand andCompany Ltd, New Delhi |
| 3 | Dr.P.P.Gupta | Statics | Kedal Nath Ram Nath . Meerut |

**WEBSITE REFERENCE**

*1.http://physcis.info*
*2.http://blog.oureducation.in*

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

**SEMESTER III**

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc Mathematics (CA) | **Programme Title** | Bachelor of Mathematics (CA) | |
| **Course Code :** | 18U3MCCT08 | Title : Core 8: Programming in C++ | **Batch** | 2018-2021 |
| | | | **Semester** | III |
| **Hours/week** | 5 Hours | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the Students

- To learn about class structure, member function & data members.
- To learn the concept of inheritance, types and example problems.
- To learn the concept of polymorphism, types and problems.
- To learn the concepts of operator overloading and inheritance.
- To learn the concept of file handling.

**COURSE OUTCOMES (CO)**

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| **CO1** | Define basic structure data types in C++ |
| **C02** | Explain functions & operations in C++ |
| **C03** | Define classes, objects, constructors & destructors |
| **C04** | Apply the operator overloading & inheritance concept |
| **C05** | Explain the files |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |
| **CO2** | - | - | ✓ | ✓ | - | ✓ | ✓ | - | - | - | ✓ | ✓ |
| **CO3** | - | - | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |
| **CO4** | - | - | ✓ | ✓ | - | - | ✓ | - | - | ✓ | ✓ | ✓ |
| **CO5** | - | - | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |

**SYLLABUS**

**UNIT I : (12 Hours)**

Evolution of C++ - Applications of C++ - Structure of C++ program- Tokens-Keywords-Identifiers and constants-Basic data types-User-defined data types-Constant pointers and pointers to constants-Symbolic constants-Type compatibility-Declaration of variables-Dynamic initialization of variables-Reference variables-operators in C++ - Scope resolution operator – Memory management operators-Manipulators-Type cast operator-expressions and their types- Special assignment expressions-Implicit conversions-Operator precedence.

**UNIT II: (12 Hours)**

Functions in C++ : The main function-function prototyping-call by reference-return by reference-inline functions-default arguments-const arguments-function overloading. Managing console I/O operations:C++ streams – C++ stream classes-unformatted console I/O operations-formatted console I/O operations-Managing output with manipulators.

**UNIT III: (12 Hours)**

Classes and Objectives: Specifying a class-Defining member functions-making an outside function inline-nesting of member functions-private member functions-arrays within a class-memory allocation for objects-arrays of objects-objects as function arguments-friend functions- objects-const

member functions. Constructors and destructors: Introduction-Constructors –parameterized constructors-multiple constructors in a class-constructors with default arguments-copy constructor.

**UNIT IV:** **(12 Hours)**

Operator Overloading : Introduction-defining operator overloading-overloading unary operators – overloading binary operators-overloading binary operators using friends-rules for overloading operators. Inheritance: Introduction-defining derived classes-single inheritance-making a private member inheritable-multilevel inheritance-multiple inheritance-heirarchical inheritance-hybrid inheritance.

**UNIT V:** **(12 Hours)**

Working with files: Introduction-Classes for file stream operations-Opening and closing a file-detecting end of file-More about open( ): File Modes-File pointers and their manipulations-Sequential input and output operations-Updating a file: Random access.

**TEXT BOOKS**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | E.Balagurusamy | Object Oriented programming with C++ | McGraw Hill Publications |
| 2 | Robert Lafore | Object oriented programming in Turbo C++ | Galgotia publications pvt.Ltd, New Delhi |
| 3 | Bjarne Stroutstrup | The C++ programming language | Addision Wesley |

**REFERENCE BOOKS**

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | D.Ravi Chandran | Programming with C++ | Tata McGraw-Hill publishing company limited |
| 2 | Ashok N.Kamthane | Object Oriented Programming with ANSI and Turbo C++ | Pearson Education Publishres |
| 3 | John R.Hubbard | Programming with C++ | TMH publishers |
| 4 | A.Singaravelu | Numerical Methods | Meenakshi Publications |

**WEBSITE REFERENCE**

1.www.programiz.com
2.https://beginnersbook.com
3.www.geeksforgeeks.org

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER III

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc Mathematics (CA) | **Programme Title** | Bachelor of Mathematics (CA) | |
| **Course Code :** | 18U3MCCP09 | Title : Core 9: Programming in C++(Practical) | **Batch** | 2018-2021 |
| | | | **Semester** | III |
| **Hours/week** | 3 Hours | | **Credits** | 2 |

**COURSE OBJECTIVES**

To enable the Students

- To learn about class structure, member function & data members.
- To learn the concept of inheritance, types and example problems.
- To learn the concept of polymorphism, types and problems.
- To learn the concept of file handling.

**COURSE OUTCOMES (CO)**

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| **CO1** | Use function |
| **C02** | Apply member function to calculate employee payslip |
| **C03** | Apply different classes |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |
| **CO2** | - | - | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | ✓ | ✓ |
| **CO3** | - | - | ✓ | ✓ | - | - | ✓ | - | - | ✓ | ✓ | ✓ |

**PROGRAMMING IN C++ PRACTICAL LIST**

1. Write a function ‘power( )’ to raise a number ‘m’ to a power ‘n’. The function takes a ‘double’ value for ‘m’ and ‘int’ value for ‘n’, and returns the result correctly. Use a default value of 2 for ‘n’ to make the function to calculate squares when this argument is omitted. Write a ‘main( )’ that gets the values of ‘m’ and ‘n’ from the user to test the function.
2. Write a program to compute compound interest of a given amount AMT for ‘n’ years. Use function overloading so that the program gets input of interest rate RATE in any of the data type ‘float’ or ‘int’.
3. Create a class which consist of employee detail ENO, ENAME, DEPT, BASIC SALARY. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade and display the payslip in a neat format using console I/O.
4. Define two classes POLAR and RECTANGLE to represent points in the polar and rectangle system. Write a program to convert from one system to another.
5. Create a class FLOAT that contains one float data member. Overload all the four arithmetic operators so that they operate on the objects of FLOAT.

## SEMESTER III

| **Programme Code :** | B.Sc Mathematics CA | **Programme Title** | Bachelor of Mathematics | |
|---|---|---|---|---|
| **Course Code :** | 18U3MCAT03 | Title :Allied 3: Accountancy-I | **Batch** | 2018-2021 |
| | | | **Semester** | III |
| **Hours/week** | 6 Hours | | **Credits** | 4 |

### COURSE OBJECTIVES

To enable the Students

- To understand the basic accounting concept and convention.
- To know about the final accounts of sole trader.
- To import knowledge on non trading concern and bill of exchange.
- To provide knowledge on consignments and joint ventures.
- To acquire knowledge in bank reconciliation statement.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| **CO1** | Explain the basic accounting concepts and the procedure to prepare journal and ledger |
| **C02** | Prepare a Final accounts of Sole Trader concern. |
| **C03** | Prepare accounting for of Non-Trading Concerns. |
| **C04** | Explain the concept of Joint Venture and Consignments |
| **C05** | Prepare Bank Reconciliation Statement. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |
| **CO2** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |
| **CO3** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |
| **CO4** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |
| **CO5** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |

### SYLLABUS

**UNIT –I** **(15 Hours)**

Fundamentals of Book Keeping – Accounting Concepts and Conventions – Journal – Ledger – Subsidiary books – Trial balance.

**UNIT – II** **(15 Hours)**

Final accounts of a sole trader with adjustments – Errors and rectification

**UNIT – III** **(15 Hours)**

Non Trading Concern - Bill of exchange – Average due date – Account current.

**UNIT – IV** **(15 Hours)**

Accounting for consignments and Joint ventures

**UNIT – V** **(15 Hours)**

Bank Reconciliation statement

**(Questions on problems and theory carry 80% and 20% of marks respectively)**

**TEXT BOOKS**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | T. S. Reddy & A. Murthy | Financial Accounting | Margham Publication, Chennai |
| 2 | K.L. Nagarajan, N. Vinayakam, P.L. Nagarajan | Principles of Accountancy | S.Chand& Company Limited |

**REFERENCE BOOKS**

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | T.S. Grewal | Introduction to Accountancy | S.Chand & Company Limited |
| 2 | Jain & Narange | Advanced Accountancy | Kalyani publishers |
| 3 | R.S.N. Pillai & Bhagavathy | Introduction to Accountancy | S.Chand & Company Limited |

**WEBSITE REFERENCE**

www.topperlearning.com
www.slideshare.net
https://www.principlesofaccounting.com

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

**SEMESTER : III**

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U3NMET01 | **Non Major Elective 1 :** Food Science and Nutrition | **Batch** | 2018-2021 |
| | | | **Semester** | III |
| **Hours/week** | 2 Hours | | **Credits** | 2 |

**COURSE OBJECTIVE**

- To understand the importance of Nutrition and the role of food in the maintenance of good health.
- To know about the functions, deficiency and toxicity of nutrients.
- To understand Malnutrition and its prevention
- To know about various adulterants in food and the methods of detecting them.
- To have an awareness on the prevailing laws, hygiene and sanitation relating to food safety.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO Number | CO Statement |
|---|---|
| **CO1** | identify the properties of various food components. |
| **CO2** | Explain the role of nutrition in the maintenance of good health. |
| **CO3** | Explain about clasification, sources, functions, requirements, health hazards due to deficiency and excess of these vitamins. |
| **CO4** | Explain the problem of malnutrition and measures to overcome the same. |
| **CO5** | Explain the various laws, available for food safety and find out whether the food is adulterated. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/ PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | ✓ | - | - | - | ✓ | - | ✓ |
| **CO2** | - | - | - | - | - | ✓ | - | - | - | ✓ | - | ✓ |
| **CO3** | - | - | - | - | - | ✓ | - | - | - | ✓ | - | ✓ |
| **CO4** | - | - | - | - | - | ✓ | - | - | - | ✓ | - | ✓ |
| **CO5** | - | - | - | - | - | ✓ | - | - | - | ✓ | - | ✓ |

**SYLLABUS**

**SYLLABUS**

**UNIT I** **(5 Hours)**

Introduction to Nutrition: Terms used in Nutrition and Health. Definitions - Health, Nutrition, Nutrients, Foods, Diet, R.D.A., Balanced diet, Malnutrition, Under nutrition, Over nutrition, Optimum nutrition. Five Food Groups and Food guide, relationship between food and nutrition, functions of food, classification of nutrients, factors affecting food consumption and food acceptance. Elementary idea of probiotics, prebiotics and organic food.

**UNIT II** **(5 Hours)**

Basic Nutrition: WATER- Functions, sources, requirements, water balance, dehydration (ORS) and toxicity. CARBOHYDRATE - Composition and classification, source, functions, requirements. LIPIDS- composition, sources, functions, requirements, deficiency and excess; fatty acids- essential and non-essential, SFA, USFA, MUFA, PUFA, significance of fatty acids, Rancidity. PROTEINS- composition, classification sources, functions, requirements, deficiency. ENERGY- unit of energy, food as a source of energy, definition of calorie and joules, energy requirement and factors affecting it- BMR, RMR, SDA.

**UNIT III**

**(5 Hours)**

VITAMINS- classification, sources, functions, requirements, deficiency and excess of the following: Vitamin A, D, E, K, C, Thiamin, Riboflavin, Niacin and B Complex. MINERALS - distribution in body, functions andsources, requirement, deficiency and excess of the following. Calcium, Phosphorus, Iron and Iodine. FIBRE- definition, types, sources, functions, importance in disease prevention

**UNIT IV** **(5 Hours)**

Ecology of malnutrition- Definition, causes and consequences of malnutrition Ecological factors leading to malnutrition such as income, family size, dietary pattern, occupation, customs, food fads, fallacies and other factors. Measures to overcome malnutrition (only introduction)- Increased agricultural production through food technology, food fortification and enrichment, Nutrition education, Nutrition intervention programme genesis, objectives and operation of school lunch programme and ICDS, Organizations that combat malnutrition- International organization – FAO, WHO, UNICEF National Organizations – ICMR, NIN, CFTRI, DFRL, ICAR

**UNIT V** **(5 Hours)**

Food Adulteration and Food Laws- Definition,Types, Common adulterants and home scale methods of detecting adulterants; Food Laws (only introduction) – PFA, BIS, AGMARK, FPO, HACCP. Food toxicants- Naturally occurring toxicants in canned foods, Alcoholic and non alcoholic beverages Sugars, preservatives, mushrooms Carcinogens in heated foods.

**TEXT BOOKS:**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Dr.A.Indhuleka | Healthy Vittles and Bits | |

**REFERENCE BOOKS:**

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Guthrie Helen. | Introductory Nutrition | Mirror/ Mosby College Publishing Times |
| 2 | Mudambi, S.R., Rajgopal, M.V. | Fundamentals of Foods and Nutrition | NewAge International Pvt. Ltd |

**Means of Curriculam Delivery:** Lecture, Group Learning, Seminar, Assignment, Google Classroom

## SEMESTER III

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U3SBST03 | Skill based subject 3: Mathematics for competitive Examinations III | **Batch** | 2018-2021 |
| | | | **Semester** | III |
| **Hours/week** | 2 Hours | | **Credits** | 2 |

**COURSE OBJECTIVES**

To enable the Students

- To make the students to know the concept of Pipes, Cistern and Probablity.
- To solve problems on Boats and Streams .
- To make the students to know the concept of Alligation or mixture,Problem of Heights and distance, odd man out series.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO NO | CO Statements |
|---|---|
| C01 | Solve the problems on pipes and cistern. |
| C02 | Solve the problems on time and distance, train, boats and stream. |
| C03 | Apply the concept of Alligation and height & distance to solve certain types of problems. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |

**SYLLABUS**

**UNIT I** **(5 Hours)**

Pipes and cistern – Probablity

**UNIT II** **(5 Hours)**

Problems on trains

**UNIT III**

**(5 Hours)**

Problems on Boats and Streams

**UNIT IV** **(5 Hours)**

Alligation or mixture

**UNIT V** **(5 Hours)**

Heights & Distance- Odd Man Out & Series **(Simple Problems only)**

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | R. S. Agarwal | Quantitative Aptitude (for Competitive Examinations) | S. Chand and Company Limited |

- 

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | R.V.Praveen | Quantitative Aptitude and Resoning, | PHI Learning pvt. Ltd |
| 2 | Abhijit Guha | Quantitative Aptitude for Competitive Examinations | Tata Mc-Graw Hill Publishing Company |

**WEBSITE REFERENCE**

*1.*https://www.careerbless.com/aptitude/qa/home.php
*2.*https://www.indiabix.com/

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER-III

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
| **Course Code:** | 18U3SBST04 | **Skill based subject 4:** Communication Skills- I | **Batch** | 2018-2021 |
| | | | **Semester** | III |
| **Hours/ Week** | 2 Hours | | **Credits** | 2 |

**COURSE OBJECTIVES:**

1. To make the students to understand the barriers in their communication and the ways to over come the same
2. To make the students to know various types of listening and the effect of enhancing the listining skills
3. To encourage Group discussion and introduce to speak in different situations and the etiquette to be maintained

**COURSE OUTCOMES (CO):**

On successful completion of the course, students should be able to achieve the following outcomes.

| CO Number | CO Statement |
|---|---|
| CO1 | to communicate meaningfully and effectively with others |
| CO2 | to explain various types of listining and be a careful listener |
| CO3 | to deal with different kinds of situations by conversing effectively and maintaining the etiquette required for such situations |

**SYLLABUS**

**UNIT –I- COMMUNICATION**

1. Verbal and Non-Verbal Communication
2. Barriers to Communication

**UNIT- II- LISTENING SKILL**

1. Types of Listening
2. Tips for Effective Listening
3. Traits of Good Listening

**UNIT- III- SPEAKING**

1. Group Discussion
2. Speaking at Different Types of Interviews
3. Making Effective Telephone Calls
4. Telephone Etiquette

**TEXT BOOKS:**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Meenakshi Raman | Communication Skills | Oxford University Press |
| 2 | Shalini Aggarwal | Essential Communication Skills | Ane Books Pvt.Ltd. New Delhi |

**REFERENCE BOOKS:**

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Course team, Bharathiyar University | Communication Skills a multi- skill course | Macmillan Publishers India LTD. |
| 2 | Krishna Mohan | Developing Communication Skills | Macmillan Publishers India LTD. |
| 3 | Joyce Pereire | Techinical English – II | Vijay Nicole Imprints Pvt.Ltd. |

**Means of Curriculam Delivery:** Lecture, Group Discussion, Seminar, Assignment, Google Class Room.

**அடிப்படைத் தமிழ்**

பகுதி – IV : தமிழ்த்தாள் - 1 - மூன்றாம் பருவம்

(12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு)

**Total Hours: 20**

**அகமதிப்பீட்டுத் தேர்வு மட்டும்**

**நோக்கம் :**

- தமிழ் எழுத்துக்களை எழுத, படிக்க தெரிந்து கொள்ளுதல்.
- சொற்களின் வகைகளைத் தெரிந்து கொள்ளுதல்.
- தொடர் அமைப்புகளைத் தெரிந்து கொள்ளுதல்.
- வாக்கியங்களைப் பிழையின்றி எழுதக் கற்றுக் கொள்ளுதல்.

**பாடப்பகுதி கற்றலின் வெளிப்பாடு – Course Outcome (CO)**

| CO Number | CO Statement |
|---|---|
| CO1 | தமிழ் எழுத்துக்களைத் தெளிவாக எழுதுதல். |
| CO2 | சொற்கள் கொடுக்கப்பட்டால் அவைகள் எச்சொற்கள் என வகைகளைக் கூறுதல். |
| CO3 | ஒரு சொற்றொடரில் எழுவாய், செயப்படுபொருள், பயனிலை எவை என கண்டறிந்து கூறுதல். |
| CO4 | வாக்கியங்களைப் பிழையின்றி எழுதுதல். |

**நிரல் விளைவுகளைக் கொண்ட வரைபடம்**

| CO /PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | ✓ | - | - | - |

- **தமிழ் மொழியின் அடிப்படைக் கூறுகள்.**

எழுத்துக்கள் : முதலெழுத்துக்கள் (உயிர் எழுத்து, மெய் எழுத்து, உயிர்மெய எழுத்து)

சொற்கள் : வகைகள் (பெயர்ச்சொல், வினைச்சொல், இடைச்சொல், உரிச்சொல்)

தொடர் : தொடரமைப்பு (எழுவாய், செயப்படுபொருள், பயனிலை)

குறிப்பு எழுதுதல் : பத்துப் பதினைந்து தொடர்களில் குறிப்பு வரைதல்

பிழைநீக்கி எழுதுதல் : (ஒற்றுப்பிழை, எழுத்துப்பிழை)

| | அக மதிப்பீட்டுத் தேர்வு மதிப்பெண் வழங்கும் முறை | மதிப்பெண்கள் |
|---|---|---|
| 1 | வகுப்புத்தேர்வு – 1 | 10 |
| 2 | வகுப்புத்தேர்வு – 2 | 10 |
| 3 | மாதிரித்தேர்வு | 10 |
| 4 | பயிற்சிக் கட்டுரை | 10 |
| 5 | வாய்மொழித் தேர்வு | 10 |
| | மொத்த மதிப்பெண்கள் | 50 |

**குறிப்பு : வாய்மொழித் தேர்வில் தமிழ்ச் செம்மொழி வரலாறு தொடர்பான வினாக்கள் மட்டுமே கேட்கப்பட வேண்டும்.**

## சிறப்புத் தமிழ்

பகுதி – IV : தமிழ்த்தாள் - 1 – மூன்றாம் பருவம்
(12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு)

**Total Hours: 20**

**அகமதிப்பீட்டுத் தேர்வு மட்டும்**

**நோக்கம்:**

மேல்நிலைக் கல்வியில் தமிழ் மொழி பயின்ற மாணவர்களுக்கு இளங்கலை பட்ட வகுப்பில் தமிழ் இலக்கியத்தின் சிறப்பினை எடுத்துக் கூறுதல்.

மரபுக் கவிதைகள், புதுக்கவிதைகள் வேறுபாடு பற்றி மாணவர்கள் அறியச் செய்தல்.

சொற்களை உச்சரிக்கும் போது ஒலி வேறுபாடு அறிந்து வாக்கியங்களில் பிழை நீக்கி எழுதச் செய்தல்.

பயன்பாட்டுத் தமிழில் கடிதங்கள் மற்றும் மடல்கள் எழுதுவதற்குப் பயிற்சியளித்தல்.

பாடப்பகுதியோடு இணைந்த இலக்கிய வரலாற்றுச் செய்திகளை அறியச் செய்தல்.

**பாடப்பகுதி கற்றலின் வெளிப்பாடு - Course Outcome (CO)**

| CO Number | CO Statement |
|---|---|
| CO1 | மரபுக்கவிதை, புதுக்கவிதைகளுக்கு இடையில் உள்ள வேறுபாடுகள் அறிதல். |
| CO2 | மொழித்திறன் பயிற்சியின் மூலம், மாணவர்கள் பிழைநீக்கி எழுதுதல். |
| CO3 | இன்றைய சூழலுக்கு ஏற்ப, விண்ணப்பங்கள், மடல்கள் மற்றும் கடிதங்கள் எழுதச்செய்தல் |
| CO4 | இலக்கியங்களின் வாயிலாக படைப்புகளின் வரலாறுகள், நோக்கம் உணர்தல். |
| CO5 | சொற்களைக் கொண்டு வாக்கியங்கள் அமைப்பதற்குப் பயிற்சி எடுத்தல். |

கூறு – 1 : பாரதியார் கவிதைகள்
கண்ணன் என் சேவகன்
பாரதிதாசன் - அழகின் சிரிப்பு (முழுவதும்)
மீரா (கவிஞர்) - குக்கூ (புதுக்கவிதை)

கூறு – 2 மொழித்திறன்
பிழைநீக்கி எழுதுதல் - றன, ரண வேறுபாடு அறிதல்
ளன, ழன, லன வேறுபாடு அறிதல்
ன, ண, ந வேறுபாடு அறிதல்
குறில் நெடில் வேறுபாடு அறிதல்

கூறு – 3 : கடிதங்கள் எழுதுதல் - பாராட்டுக் கடிதம், நன்றிக்கடிதம், அழைப்புக்கடிதம், அலுவலக விண்ணப்பம்.

கூறு – 4 சொற்களைத் தந்து தொடர்களை அமைக்கும் பயிற்சி அளித்தல், வல்லினம் மிகும் இடங்கள்.

கூறு – 5 பாடந்தழுவிய வரலாறு.

| | அக மதிப்பீட்டுத் தேர்வு மதிப்பெண் வழங்கும் முறை | மதிப்பெண்கள் |
|---|---|---|
| 1 | வகுப்புத்தேர்வு – 1 | **10** |
| 2 | வகுப்புத்தேர்வு – 2 | **10** |
| 3 | மாதிரித்தேர்வு | **10** |
| 4 | பயிற்சிக் கட்டுரை | **10** |
| 5 | வாய்மொழித் தேர்வு | **10** |
| | மொத்த மதிப்பெண்கள் | **50** |

**குறிப்பு : வாய்மொழித் தேர்வில் தமிழ்ச் செம்மொழி வரலாறு தொடர்பான வினாக்கள் மட்டுமே கேட்கப்பட வேண்டும்.**

## SEMESTER IV

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U4MCCT10 | Title : Core 10: Differential Equations & Laplcae transforms | **Batch** | 2018-2021 |
| | | | **Semester** | IV |
| **Hours/week** | 7 Hours | | **Credits** | 4 |

**COURSE OBJECTIVES**

To enable the Students

- To make the students solve ordinary differential Equations of First order and second order, partial Differential Equations
- To find the solution of second order linear differential equations.
- To find the solution of differential equations by eliminating arbitrary constants and arbitrary funcions.
- To gain knowledge about Laplace Transforms and Inverse Laplace Transforms.
- To understand Applications of Laplace Transforms.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO NO | CO Statements |
|---|---|
| C01 | Solve the differential equations of first order and of degree higher than one solvable for p, x and y. |
| C02 | Solve linear differential equations of second order. |
| C03 | Solve the partial differential equations by eliminating arbitary constants and arbitary functions and also by Lagranges linear equations. |
| C04 | Solve the linear differential equations using the Laplace transform techniques. |
| C05 | Apply the Inverse Laplace transform technique to first order and second order differential equations. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | - | - | - | - | - | ✓ | - | - | - |
| **CO2** | - | - | - | - | - | ✓ | - | - | - | - | - | ✓ |
| **CO3** | - | ✓ | - | - | ✓ | | - | - | - | - | - | ✓ |
| **CO4** | - | - | ✓ | - | - | ✓ | - | - | - | - | - | ✓ |
| **CO5** | - | - | ✓ | - | - | ✓ | - | - | - | - | - | ✓ |

**SYLLABUS**

**UNIT I** **(17 Hours)**

Ordinary Differential Equations:Equations of First order and of Degree higher than one-

Solvable for p,for x,for y-Clariauts equation.

**UNIT II** **(17 Hours)**

Solving the linear differential equations of the form $(aD^3+bD^2+cD+d)y=x$,where a,b,c,d are constants & x is of the form $e^{mx}$,cosmx, sinmx, x, $x^2$ ,x $e^{mx}$ ,xsinmx, $x^2$ sinmx, $e^{mx}$ sinnx, $e^{mx}$ cosnx.

**UNIT III** **( 17 Hours)**

Partial Differential Equation- Formation of equations by eliminating arbitrary constants and arbitrary functions-Solutions of PDE in Standard types I&II-Lagranges linear equations.

**UNIT IV** **(17 Hours)**

Laplace Transforms-Definition-Laplace transforms of Standard functions-Linearity property-First shifting theorm.

**UNIT V** **(17 Hours)**

Inverse Laplace Transforms-Applications to solutions of First order and second order Differential Equations with constant coefficients.

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Kandasamy.P,Thilagavathi. K | Mathematics for B.Sc-Branch-I volume-III | S.Chand&Co |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | S.Narayanan,T.K.Manickavachagom Pillai | Calculus volume-III(Differential Equations &Fourier Series and Fourier Transforms) | Viswanathan Printers |
| 2 | N.P.Bali | Differential equations | Laxmi Publications |
| 3 | Venkatasubramaninan N.K,Sunderan V,Lakshmi Narayanan K.A & Balalsubramaninan | Engineering Mathematics | JJ Publications |
| 4 | Dr.M.K.Venkataraman,Mrs. Manorama Sridhar | Differential Equations and Laplace Transforms, | The National Publishing Co |

**WEBSITE REFERENCE**

*1.*http://www.vyssotski.ch

*2.http:// math.stackexchange.com*

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

**SEMESTER IV**

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U4MCCT11 | Title : Core 11:Dynamics | **Batch** | 2018-2021 |
| | | | **Semester** | IV |
| **Hours/week** | 6 Hours | | **Credits** | 4 |

**COURSE OBJECTIVES**

*To enable the Students*

- To understand concepts of Kinematics and Projectile motion of Particles,
- To learn about radial and transverse components in central orbit
- To gain knowledge about Simple Harmonic motion and its applications.
- To learn about the concept of impulsive force and collision of elastic force.
- To get exposed to the knowledge about the collision of bodies and Loss of Kinetic energy.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO NO | CO Statements |
|---|---|
| C01 | Understand and work with practical problems in dynamics. |
| C02 | Evaluate the forces in central orbit by applying the action of central forces. |
| C03 | Remember the motion which was studied under simple harmonic motion. |
| C04 | Analyze the concepts of impulse, impulsive forces and the collision of elastic forces and be able to solve the simple problems. |
| C05 | Know the basic concepts of laws of kinetic energy using smooth and oblique surface. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | ✓ | ✓ | ✓ | - | - | - | - | ✓ |
| **CO2** | - | ✓ | ✓ | - | - | - | - | - | - | - | - | - |
| **CO3** | - | ✓ | ✓ | - | - | - | - | - | - | - | - | ✓ |
| **CO4** | - | ✓ | ✓ | - | - | ✓ | - | - | - | - | - | ✓ |
| **CO5** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | - |

**SYLLABUS**

**UNIT I** **(15 Hours)**

Projectiles- Path of a Projectile- Characteristics of the motion of a projectile-problem- Maximum horizontal range of Projectile-Range on an inclined plane-Greatest distance of the projectile from the inclined plane-Maximum range on the inclined plane-problems

**UNIT II** **(15 Hours)**

Central orbits-Radial and Transverse components of Velocity and Acceleration-Problems-Differential Equation of central orbit- perpendicular from pole on the tangent -Pedal Equation of the central orbit-Areal Velocity-Problems

**UNIT III** **(15 Hours)**

Simple Harmonic Motion- Simple Harmonic motion in a straight line -Amplitude, Periodic time -General solution of SHM-problems- -Phase and Epoch-Composition of two simple Harmonic motion of the same Period in the same straight line and in two perpendicular directions.

**UNIT IV** **(15 Hours)**

Collision of Elastic bodies-Fundamental laws of impact -Impact of a smooth sphere on a fixed smooth plane-Problems-Direct Impact of two smooth spheres - Oblique Impact of two smooth spheres-problems.

**UNIT V** **(15 Hours)**

Loss of Kinetic energy due to direct impact of two smooth spheres- Loss of Kinetic energy due to oblique impact of two smooth spheres-Problems

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | M.K .Venkataraman | Dynamics | Agasthiar Publications Trichy |

***Reference Book***

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | A.V.Dharmapadam | Dynamics | S. Viswanathan printers and Publishing Ltd |
| 2 | K.Viswanatha Naik and M.S.Kasi | Dynamics | Emerald publishers,New |
| 3 | Narayanamurthi | Dynamics | National Publishers,New Delhi |

**WEBSITE REFERENCE**

*1.http:// firebase.google.com*
*2.http://www.bristol.ac.uk*

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER IV

| **Programme Code :** | B.Sc Mathematics CA | **Programme Title** | Bachelor of Mathematics | |
|---|---|---|---|---|
| **Course Code :** | 18U4MCCT12 | Title : Core 12: Data Structure using C++ | **Batch** | 2018-2021 |
| | | | **Semester** | IV |
| **Hours/week** | 5 Hours | | **Credits** | 3 |

### COURSE OBJECTIVES

To enable the Students

- To know the basic concepts of data structures.
- To understand the concept of stack and Queue
- To learn the concept of arrays and linked lists.
- To acquire the knowledge of trees.
- To know about the basic concepts of graphs and trees.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| **CO1** | Define basic data structure concept |
| **C02** | Apply stack & Queue concepts |
| **C03** | Use link & list concepts |
| **C04** | Define trees |
| **C05** | Explain graph in C++ |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |
| **CO2** | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | ✓ | ✓ |
| **CO3** | - | - | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |
| **CO4** | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |
| **CO5** | - | - | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |

### SYLLABUS

**UNIT-1** **(12 Hours)**

Data Structures:Definition of a Data structure-primitive and composite Data Types, Arrays,Operations on Arrarys, Order lists.

**UNIT 2** **(12 Hours)**

Stacks-Operations on stack-Applications of stack; Expression; Recursion Structure. Queues-Circular Queue-Operations on Queues, Queue Applications.

**UNIT 3** **(12 Hours)**

Singly Linked List-Operations, Application- Representation of a Polynomial, Polynomial Addition: Doubly Linked List-Operations.

**UNIT 4** **(12 Hours)**

Trees:Binary Trees-definitions-Binary Search tree-Conversion of Forest to Binary Tree, Operations.

**UNIT 5** **(12 Hours)**

Graph – Definition, Types of graphs-Memory Representation-Graph traversal. Hashing Tables and Hashing Functions.

**TEXT BOOKS**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | E.Horowitz and S.Shani | Fundamentals of Data Structures in C+ | Galgotia publication |

**REFERENCE BOOKS**

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | R.Kruse C.L. Tondo an B.Leung | Data Structures and Program design in C | PHI |
| 2 | Cangsam,Auguenstein, Tenenbaum | Data Structures using C & C++ | PHI |
| 3 | D.Samantha | Classic Data Structures | PHI, New Delhi |

**WEBSITE REFERENCE**

www.tutorialspoint.com
www.includehelp.com
www.cplusplus.com

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER IV

| **Programme Code :** | B.Sc Mathematics CA | **Programme Title** | Bachelor of Mathematics | |
|---|---|---|---|---|
| **Course Code :** | 18U4MCCP13 | Title : Core 13: Data structure using C++ (Practical) | **Batch** | 2018-2021 |
| | | | **Semester** | IV |
| **Hours/week** | 3 Hours | | **Credits** | 2 |

### COURSE OBJECTIVES

To enable the Students

- To know the basic concepts of data structures.
- To learn the concept of arrays, stack operations and linked lists.
- To know about the basic concepts of graphs and trees.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| **CO1** | Use push, pop, all, delete, polynomial & operations in array |
| **C02** | Use heap sort and binary swatch |
| **C03** | Use depth first & breath first search for graph |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | ✓ | ✓ | ✓ |
| **CO2** | - | - | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | ✓ | ✓ |
| **CO3** | - | - | ✓ | ✓ | - | - | ✓ | - | - | ✓ | ✓ | ✓ |

### DATA STRUCTURE USING C++ PRACTICAL LIST

1.Implement PUSH, POP operations of stack using Arrays.
2.Implement PUSH,POP operations of stack using Pointers.
3.Implement add, delete operations of a queue using Arrays.
4.Implement add, delete operations of a queue using Pointers.
5.Addition of two polynomials using Arrays and Pointers.
6.Depth first search and Breadth first search for graphs using Recursion.

## SEMESTER IV

| **Programme Code :** | B.Sc Mathematics CA | **Programme Title** | Bachelor of Mathematics | |
|---|---|---|---|---|
| **Course Code :** | 18U4MCAT04 | Title :Allied 4: Accountancy-II | **Batch** | 2018-2021 |
| | | | **Semester** | IV |
| **Hours/week** | 6 Hours | | **Credits** | 4 |

### COURSE OBJECTIVES

To enable the Students

- To gain knowledge about the various methods of calculating depreciation.
- To know about the methods under single entry system.
- To provide knowledge in the preparation of departmental and branch accounts.
- To make the students to prepare hire purchase accounts.
- To familiarise the students about royalties and sublease.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| **CO1** | Explain the methods of depreciation and to calculate the rate of depreciation. |
| **C02** | Calculate the statement of affairs method and conversion method. |
| **C03** | Prepare departmental accounts and branch accounts. |
| **C04** | Prepare of Hire Purchase and Instalment system |
| **C05** | Prepare of Royalties account. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |
| **CO2** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |
| **CO3** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |
| **CO4** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |
| **CO5** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(15 Hours)**

Depreciation – Methods of Depreciation: Straight Line Method - Written Down Value Method – Sinking Fund Method – Annuity Method – Insurance Policy Method.

**Unit II** **(15 Hours)**

Single Entry System – Meaning – Features – Statement of Affairs Method and Conversion Method

**Unit III** **(15 Hours)**

Departmental accounts-Branch accounts excluding Foreign Branches.

**Unit IV** **(15 Hours)**

Hire purchase and installment System excluding Hire purchase Trading account.

**Unit V** **(15 Hours)**

Royalties - Minimum Rent – Short Working – Recoupment – Strike Period (excluding Sub-lease)

**(Questions on problems and theory carry 80% and 20% of marks respectively)**

**TEXT BOOKS**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | T. S. Reddy & A. Murthy | Financial Accounting | Margham Publication, Chennai |
| 2 | K.L. Nagarajan, N. Vinayakam, P.L. Nagarajan | Principles of Accountancy | S.Chand& Company Limited |

**REFERENCE BOOKS**

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | T.S. Grewal | Introduction to Accountancy | S.Chand & Company Limited |
| 2 | Jain & Narange | Advanced Accountancy | Kalyani publishers |
| 3 | R.S.N. Pillai & Bhagavathy | Introduction to Accountancy | S.Chand & Company Limited |

**WEBSITE REFERENCE**

www.xara.com
https://ignoubcom.wordpress.com
www.meritnation.com

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER IV

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U4NMET02 | **Non Major Elective 2 :** Floriculture | **Batch** | 2018-2021 |
| | | | **Semester** | IV |
| **Hours/week** | 2 Hours | | **Credits** | 2 |

**COURSE OBJECTIVE**

- To make the students know what is floriculture, its status, scope and development.
- To make the students to know how to cultivate various types of cut flowers, arranging bouquets and scope of loose flowers to trade.
- To make the students understand how to make various designs such as vase design, basket/mug design etc.,
- To make the students clear about how to propogate various varieties of flowers which are Annuals & Perennials and their growing techniques.
- The students will be made to understand whether floriculture can be taken,as their career and the opportunities available.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO Number | CO Statement |
|---|---|
| **CO1** | Explain the scope, status and development of floriculture in India. |
| **CO2** | To make use of cut flowers in arranging bouquets and explain the significance of loose flowers to trade. |
| **CO3** | Demonstrate how to make vase design, basket / mug design creatively by using flowers. |
| **CO4** | Explain the varieties of flowers which are annuals and perennials and their growing techniques. |
| **CO5** | Make floriculture to be taken as their career by knowing the government incentives, subsidies and other supporting agencies. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/ PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | - | - | - | - | ✓ | - | - |
| **CO2** | - | - | - | - | - | - | - | - | - | ✓ | - | - |
| **CO3** | - | - | - | - | - | - | - | - | - | ✓ | - | - |
| **CO4** | - | - | - | - | - | - | - | - | - | ✓ | - | - |
| **CO5** | - | - | - | - | - | - | - | - | - | ✓ | - | - |

**SYLLABUS**

**(5 Hours)**

**UNIT I**

Floriculture – Definition, Introduction and Scope of Floriculture. Status of floriculture in India. Development of Floriculture

**UNIT II** **(5 Hours)**

Cut Flowers- Types of cut flowers, Arranging bouquets, Using floral design tools. Loose Flowers- Scope of loose flower trade, Significance in the domestic market/export,

**UNIT III** **(5 Hours)**

Design- Types of design Flower choice for design, Corsages/Boutonnières, Vase design, Basket/mug design.

**UNIT IV** **(5 Hours)**

Propagation-Types of propagation, Annuals & Perennials, Varieties, Growing seasons, Potting techniques.

**UNIT V** **(5 Hours)**

Careers in Floriculture. Export/Import and marketing in floriculture. Government Incentives and Schemes. The role of supporting agencies.

**TEXT BOOKS:**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Dr.S.N.Suresh | Introduction to Floriculture | Teachers Publishing House. |

**REFERENCE BOOKS:**

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Jacob Varghese Kunthara | Know your Garden Plants | H and C Books |
| 2 | Dr. B. Hemlanaik | Production Technology of Ornamental Crops and Landscape Gardening | UAHS,Shimoga |

**Means of Curriculam Delivery:** Lecture, Group Learning, Seminar, Assignment, Case Studies, Google

## SEMESTER IV

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U3SBST05 | Skill Based Subject 5: Mathematics for Competitive Exmainations IV | **Batch** | 2018-2021 |
| | | | **Semester** | IV |
| **Hours/week** | 2 Hours | | **Credits** | 2 |

**COURSE OBJECTIVES**

To enable the Students

- To make the students to know the methods of solving problems of Interest and Venn Diagrams
- To solve problems related to on Sequence and series.
- To develop the skills in solving problems for checking ones Mental Ability and Logical reasoning.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO No. | CO Statements |
|---|---|
| C01 | Explain the concept of finance and derive the inference using Venn- diagram. |
| C02 | Solve the problems on logarithms, area, Volume, Sequence and series. |
| C03 | Find solution to the problems on Tabulation, graphs and puzzles. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |

**SYLLABUS**

**UNIT I** **(5 Hours)**

Simple Interest-Compound Interest -Logcal Venn Diagram

**UNIT II** **(5 Hours)**

Logarithms – Sequence and series

**UNIT III** **(5 Hours)**

Area-Volume and Surface areas

**UNIT IV** **(5 Hours)**

Tabulation-Bar Graphs-Puzzles

**UNIT V** **(5 Hours)**

Pie Charts-line Graphs- Mental Ability and Logical reasoning

(Simple Problems only)

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | R. S. Agarwal | Quantitative Aptitude (for Competitive Examinations) | S. Chand and Company Limited |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | R.V.Praveen | Quantitative Aptitude and Resoning | PHI Learning pvt. Ltd |
| 2 | Abhijit Guha | Quantitative Aptitude for Competitive Examinations | ata Mc-Graw Hill Publishing Company |

**WEBSITE REFERENCE**

*1.*https://www.careerbless.com/aptitude/qa/home.php

***2.***https://www.indiabix.com/

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER-IV

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| Course Code: | 18U4SBST06 | Skill Based Subject 6 : Communication Skills- II | Batch | 2018-2021 |
| | | | Semester | IV |
| Hours/ Week | 2 Hours | | Credits | 2 |

**COURSE OBJECTIVES:**

1.To know clearly the use of various symbols for pronunciating the words with proper sounds.

2. to make aware of various techniques of reading and writing different reports.

**COURSE OUTCOMES (CO):**

On successful completion of the course, students should be able to achieve the following outcomes.

| CO Number | CO Statement |
|---|---|
| CO1 | To be able to prounuce the words clearly with proper pronunciation. |
| CO2 | Read the given materials properly and to write meaningful reports |

**SYLLABUS**

**UNIT-I : READING & WRITING**

1. Resume Preparation
2. Report Writing
3. Minutes of a Meeting
4. Data Representation and Interpretation
5. Memos

**UNIT- II : SOUNDS & SYMBOLS**

1. Vowels
2. Consonants
3. Dipthongs
4. Stress and Intonation

**TEXT BOOKS:**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Meenakshi Raman | Communication Skills | Oxford University Press |
| 2 | Shalini Aggarwal | Essential Communication Skills | Ane Books Pvt.Ltd. New Delhi |

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

**அடிப்படைத் தமிழ்**

பகுதி – IV : தமிழ்த்தாள் - 2 – நான்காம் பருவம்

(12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு)

**Total Hours: 20**

**அகமதிப்பீட்டுத் தேர்வு மட்டும்**

**நோக்கம்:**

- ஆத்திச்சூடி, கொன்றை வேந்தன், திருக்குறள் போன்ற நூல்களில் கூறப்பட்டுள்ள நீதிகளைத் தெரிந்து கொள்ளுதல்.
- தடையில்லாமல், பிழையில்லாமல் படிப்பதற்கு எளிமையான கதைகளைப் படித்துப் பழகுதல்.
- தமிழ் இலக்கியங்களின் வரலாறு மற்றும் சிறப்புகளை அறிந்து கொள்ளச்செய்தல்.
- தமிழக மக்களின் வாழ்க்கை முறை உணவுமுறை, கலாச்சாரம், பண்பாடு பற்றி அறிந்துகொள்ளச் செய்தல்.

**பாடப்பகுதி கற்றலின் வெளிப்பாடு (Course Outcome)**

| CO Number | CO Statement |
|---|---|
| CO1 | ஆத்திச்சூடி, கொன்றை வேந்தன், திருக்குறள் போன்ற நூல்களின் வழி அக்கால மக்கள் பின்பற்றிய நீதிகளை அறிந்து அதன்படி வாழ்தல். |
| CO2 | எளிமையான நூல்களைப் படிப்பதன் மூலம், பிழையில்லாமல், தெளிவான உச்சரிப்போடு கதைகளைப் படித்துப் பழகுதல். |
| CO3 | தமிழ் இலக்கியங்களின் வரலாறு மற்றும் அதன் சிறப்புகளை அறிந்து கொள்ளுதல். |
| CO4 | பழங்கால மக்களின் வாழ்க்ககை முறை, பண்பாடு, கலாச்சாரம் ஆகியவற்றை அறிந்து கொள்ளுதல். |

**நிரல் விளைவுகளைக் கொண்ட வரைபடம்**

| CO /PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | ✓ | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | ✓ | - | - | ✓ | - | - | - |
| CO3 | - | - | - | - | ✓ | - | - | - | - | - | ✓ | - |
| CO4 | ✓ | - | ✓ | - | - | - | - | - | - | - | - | - |

**நீதி நூல்கள்** : ஆத்திச்சூடி (முதல் 12) “அறம் செய விரும்பு”, முதல் “ஔவியம்

- பேசேல்” வரை.

**கொன்றை வேந்தன்** - “அன்னையும் பிதாவும் முன்னறி தெய்வம்” முதல் “எண்ணும் எழுத்தும் கண்ணெனத்தகும்” வரை (7)

**திருக்குறள்** (5)
1. அகர முதல... (1)
2. செயற்கரிய... (26)
3. மனத்துக் கண்... (34)
4. கற்க கசடறக்... (391)
5. எப்பொருள் யார் யார்... (423)

**எளிய நீதிக் கதைகள்** - (தெனாலிராமன் கதைகள், பீர்பால் கதைகள், கிராமியக் கதைகள், ஈசாப் கதைகள்)

தமிழ் இலக்கியங்கள் : வரலாறு – குறிப்பு – அறிமுகம்
எடுத்துக்காட்டு : குறள் பற்றி எளிய தொடர்களில் அறிமுகம்
தமிழகம் - உணவுமுறை, விழாக்கள், கலைகள் பற்றியக் குறிப்புகள்

| | **அக மதிப்பீட்டுத் தேர்வு மதிப்பெண் வழங்கும் முறை** | **மதிப்பெண்கள்** |
|---|---|---|
| 1 | வகுப்புத்தேர்வு – 1 | **10** |
| 2 | வகுப்புத்தேர்வு – 2 | **10** |
| 3 | மாதிரித்தேர்வு | **10** |
| 4 | பயிற்சிக் கட்டுரை | **10** |
| 5 | வாய்மொழித் தேர்வு | **10** |
| | மொத்த மதிப்பெண்கள் | **50** |

**குறிப்பு : வாய்மொழித் தேர்வில் தமிழ்ச் செம்மொழி வரலாறு தொடர்பான வினாக்கள் மட்டுமே கேட்கப்பட வேண்டும்.**

## சிறப்புத் தமிழ்

பகுதி – IV : தமிழ்த்தாள் - 2 – நான்காம் பருவம்

(12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு)

## Total Hours: 20

## அகமதிப்பீட்டுத் தேர்வு மட்டும்

**நோக்கம்:**

- இளங்கலை பட்ட வகுப்பில் தமிழ் - பயிலாதவர்களுக்கு, தமிழ் இலக்கியத்தின் சிறப்பினை எடுத்துக்கூறுதல்.
- திருக்குறளின் சிறப்பை அறியச் செய்தல்.
- சொற்களைப் பயன்படுத்தும் முறைகளையும், வாக்கியப் பிழைகள் ஏற்படுவதைத் தவிர்க்கும் முறைகளையும் அறியச் செய்தல்.
- பேச்சு வழக்குகளில் நாம் பயன்படுத்தும் சொற்களையும், சொற்களில் உள்ள பிழைகளையும், சரியாகப் பயன்படுத்தும் சொற்களையும் தெரிந்து கொள்ளச் செய்தல்.
- மாணவர்களின் கற்பனைத்திறன், படைப்பாற்றல் திறமை மேம்படுத்த பயிற்சி அளித்தல்.

**பாடப்பகுதி கற்றலின் வெளிப்பாடு (Course Outcome)**

| CO Number | CO Statement |
|---|---|
| CO1 | தமிழ் இலக்கியங்களின் சிறப்பினை உணரச் செய்தல் |
| CO2 | திருக்குறளின் வாயிலாக மக்களின் வாழ்க்கைமுறைகளை அறிதல் |
| CO3 | வாக்கியங்களை பிழையில்லாமல் சரியான முறையில் எழுதுதல். |
| CO4 | பேச்சு வழக்கில் நாம் பேசும் போது ஏற்படும் மரபுபிழைகளைத் தவிர்த்தல் மற்றும் தகுதியான வழக்குச் சொற்களைப் பயன்படுத்துதல். |
| CO5 | திறமையான மாணவர்களை ஊக்குவித்து படைப்பாளர்களாக, கவிஞர்களாக உருவாக்குதல். |

கூறு – 1 திருக்குறள் - ஒழிபியல் முதல் 5 அதிகாரங்கள் மட்டும்.

கூறு – 2 உரைநடை : (கட்டுரை)

(இளைஞர்களின் ஒளிமயமான எதிர்காலத்திற்கு - கு.வெ. பாலசுப்பிரமணியம்)

கூறு – 3 எழுத்துப்பிழை நீக்க வழிகள் - பிழையும் திருத்தமும், சொற்களைச் சரியாகப் பயன்படுத்தும் பாங்கு – வினைச்சொற்கள் துணை வினைகள்

(எடுத்துக்காட்டுகளுடன் விளக்குதல்)

கூறு – 4 வழக்கறிதல் : மரபு வழக்கு - இயல்பு வழக்கு – தகுதி வழக்கு அறிதல்

கூறு – 5 படைப்பாற்றல் பயிற்சி – கட்டுரை எழுதுதல்.

| | அக மதிப்பீட்டுத் தேர்வு மதிப்பெண் வழங்கும் முறை | மதிப்பெண்கள் |
|---|---|---|
| 1 | வகுப்புத்தேர்வு – 1 | 10 |
| 2 | வகுப்புத்தேர்வு – 2 | 10 |
| 3 | மாதிரித்தேர்வு | 10 |
| 4 | பயிற்சிக் கட்டுரை | 10 |
| 5 | வாய்மொழித் தேர்வு | 10 |
| | மொத்த மதிப்பெண்கள் | 50 |

**குறிப்பு : வாய்மொழித் தேர்வில் தமிழ்ச் செம்மொழி வரலாறு தொடர்பான வினாக்கள் மட்டுமே கேட்கப்பட வேண்டும்.**

## SEMESTER V

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U5MCCT14 | Title : Core 14: Real Analysis | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week** | 6 Hours | | **Credits** | 5 |

**COURSE OBJECTIVES**

To enable the Students

- To know about Real number systems, Inequalities, Collections of countable sets.
- To understand the concept of Covering and Basic topology in metric spaces.
- To Know about convergent, Cauchy, Continuous functions, Bolzano's theorem.
- To know the concepts of derivative and properties of derivative
- To know about Riemann and Riemann Stieltjes integral and properties.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO NO | CO Statements |
|---|---|
| C01 | Explain about real number system, collection of countable, uncountable sets and intersection theorem. |
| C02 | Discuss the concepts of covering and basic topology in metric space. |
| C03 | Understand the concepts of continuity, convergent sequences and metric space. |
| C04 | Explain the concepts of derivatives, properties of derivatives and bounded variation. |
| C05 | Understand the concept of variation and Riemann Stieltjes Integral. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | - | - | - |
| **CO2** | - | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | - |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO4** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO5** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | - |

**SYLLABUS**

**UNIT I** **(12 Hours)**

Least upper bound- greatest lower bound- the Cauchy schwartz inequalities – countable and uncountable sets – uncountability of the real number systems – Set Algebra – Countable collections of countable sets-Elements of point set topology- Euclidean space $R^n$ - Open balls and open sets in $R^n$ . The structure of open sets in $R^n$ -closed and adherent points – The Bolzano – Weierstrass therorem - the Cantor intersection Theorem.

**UNIT II** **(12 Hours)**

Covering – Lindelof covering theorem – the Heine Borel covering theorem – Compactness in $R^n$ - Metric Spaces – Point set topoloy in metric spaces – compact subsets of a metric space – Boundary of a set.

**UNIT III** **(12 Hours)**

Convergent sequences in a metric space – Cauchy sequences – Completeness sequences – Complete metric spaces. Limit of a function – Continuous function – Continuity of composite functions – Continuity and inverse images of open or closed sets – functions continuous on compact sets – topological mappings – Bolzano's Theroem.

**UNIT IV** **(12 Hours)**

Definition of derivative – Derivative and continuity - Algebra of derivatives – Roll's theorem – The mean value theorem for derivatives – Taylor's formula with remainder. Properties of monotone functions – functions bounded variation – total variation – additive properties of total variation on [a,x] as a function of bounded variation expressed as the difference of increasing functions – Continuous functions of bounded variation.

**UNIT V** **(12 Hours)**

The Riemann – Stieltjes integral- Introduction - Notation – The definition of Riemann – Stieltjes integral – linear properties – Integration by parts – change of variable in a Riemann – Stieltjes integral – Reduction to a Riemann integral.

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Tom.M.Apostol | Mathematical Analysis | Addison – Wisely, Narosa publishing company, Chennai, |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | R.R.Goldberg | Methods of Real Analysis | NY, John Wiley, New York |
| 2 | G.F.Simmons | Introduction to Topology and Modern Analysis | McGraw – Hill, New York |
| 3 | G.Birkhoff and MacLane | A Survey of Modern Algebra | Third Edition, Macmillian NewYork |
| 4 | J.N.Sharma and A.R.Vasistha | Real Analysis | Krishna Prakashan Media (P) Ltd |

**WEBSITE REFERENCE**

*1.www.math.lousiville.edu*

*2.http://math.stackexchange.com*

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER V

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U5MCCT15 | Title : Core 15:Modern Algebra | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week** | 6 Hours | | **Credits** | 5 |

**COURSE OBJECTIVES**

To enable the Students

- To recollect the concepts of sets, mapping and relations.
- To understand the concepts of Groups and Subgroups.
- To get exposed to the knowledge of cauchy's theorem and sylow's theorem.
- To acquire the knowledge of homomorphism, isomorphism and automorphism of groups.
- To learn about rings, ideals, Integral domain and Field of Quotients.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO NO | CO Statements |
|---|---|
| C01 | Recollect the concepts of sets, mapping, relations and related examples. |
| C02 | Understand the basic definitions and properties of groups, subgroup and find simple proofs for results in group theory. |
| C03 | Explain the concepts of homomorphism, isomorphism and automorphism of groups and rings. |
| C04 | Apply the concepts of homomorphism, isomorphism and automorphism of groups and related theorems. |
| C05 | Extend the results from group theory to study the properties of rings and fields and to posses the ability to work within their algebraic structures. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | - |
| **CO2** | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | - | - | - |
| **CO3** | - | ✓ | - | - | - | - | ✓ | - | - | - | - | ✓ |
| **CO4** | - | ✓ | - | - | - | ✓ | ✓ | - | - | - | - | ✓ |
| **CO5** | - | ✓ | - | - | - | ✓ | ✓ | - | - | - | - | ✓ |

**SYLLABUS**

**UNIT I** **(15 Hours)**

Sets – Mappings – Relations and binary operations – Groups: Abelian group, Symmetric group Definitions and Examples – Basic properties.

**UNIT II** **(15 Hours)**

Subgroups – Cyclic subgroup – Index of a group – order of an element - Fermat theorem – A Counting Principle – Normal Subgrous and Quotient Groups.

**UNIT III** **(15 Hours)**

Homomorphisms – Cauchy's theorem for Abelian groups – Sylow's theorem for Abelian groups Automorphisms – Inner automorphism – Cayley's theorem, permutation groups.

**UNIT IV** **(15 Hours)**

Rings: Definition and Examples – Some special Classes of Rings – Commutative ring – Field – Integral domain – Homomorphisms of Rings.

**UNIT V** **(15 Hours)**

Ideals and Quotient Rings – More Ideals and Quotient Rings – Maximal ideal – The field of Quotients of an Integral Domain

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | N.Herstein | Topics in Algebra | John Wiley & Sons, New York |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | S.Arumugam, A.T. Issa | Modern Algebra | Scitech Publications |
| 2 | Surjeet singh, Qazi zameeurddin | Modern Algebra | Vikas Publishing house |
| 3 | A.R. Vasishtha | Modern Algebra | Krishna prakashan Mandir, Meerut, |

**WEBSITE REFERENCE**

*1.http://ocw.mit.edu*
*2.http://mathforum.org*

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER V

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc Mathematics (CA) | **Programme Title** | Bachelor of Mathematics (CA) | |
| **Course Code :** | 18U5MCCT16 | Title : Core 16: Visual Basic | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week** | 5 Hours | | **Credits** | 3 |

### COURSE OBJECTIVES

To enable the Students

- To understand the Fundamentals in VB.
- To acquire the knowledge of condition & loop statements.
- To know about Drop down Menus, Error Handlers
- To make the students to understand the basics of Dynamic arrays
- To understand the Data files.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| **CO1** | Explain about basic concept in visual basic |
| **C02** | Define condition & loop statements |
| **C03** | Use numbers and error handling functions |
| **C04** | Explain modules & arrays |
| **C05** | Define files |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |
| **CO3** | - | - | ✓ | ✓ | - | - | ✓ | - | - | ✓ | ✓ | ✓ |
| **CO4** | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |
| **CO5** | - | - | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | ✓ |

### SYLLABUS

**UNIT I: (12 Hours)**

Introduction to VB-Event and Event procedure-Object related concept-VB program development process-Components-VB environment-saving and running-VB project-VB fundamentals-constants-variables-operators-library functions.

**UNIT II: (12 Hours)**

Branching and looping-logical operators- If-then, if-then-else, Select case-For next, Do loop. While-wend, Stop-VB control functions-Forms and controls.

**Unit III:** **(12 Hours)**

Menus and dialog boxes:Building drop down menus, Accessing menu-sub menus-Popup menus-dialog boxes. Executing and debugging a new project-Errors-error handlers.

**UNIT IV:** **(12 Hours)**

Procedures:Modulus and procedures-sub procedures-Event procedures-Function procedures. Arrays: Characteristics -Declarations-Dynamic Arrays-Control Arrays.

**UNIT V:** **(12 Hours)**

Data files: Characteristics-Accessing and saving a file in VB-Processing-Sequential data file-Random access file-Binary files.

**TEXT BOOKS**

Recent editions of the following books only are recommended

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Byron S Goutfield | VB | Schamn's outlines |

**REFERENCE BOOKS**

| S. No | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Mohammed Azam | Programming with VB 6.0 | Vikas Publications |

**WEBSITE REFERENCE**

1 .www.techopedia.com
2. https://visualtudio.microsoft.com
3. https://www.vbtutor.net

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER V

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc Mathematics (CA) | **Programme Title** | Bachelor of Mathematics (CA) | |
| **Course Code :** | 18U5MCCP17 | Title : Core 17: Visual Basic (Practical) | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week** | 3 Hours | | **Credits** | 2 |

### COURSE OBJECTIVES

To enable the Students

- To understand the Fundamentals in VB.
- To Know about Drop down Menus, Error Handlers
- To make the students to understand the basics of Dynamic arrays and Data files.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| **CO1** | Use textbox, combo box, command button and pop-up menu |
| **C02** | Use scroll bars, drop down menu and input boxes |
| **C03** | Calculate factorial and sort list of numbers |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | ✓ | ✓ | ✓ |
| **CO2** | - | - | ✓ | ✓ | - | - | ✓ | - | - | ✓ | ✓ | ✓ |
| **CO3** | - | - | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | ✓ | ✓ |

### VISUAL BASIC PRACTICAL LIST

1.In VB, create a project that displays the current date and time. Use VB variable Now and the Format library function.
2. Write a program to enter and display text. Use text box and command button.
3. Write a program to convert temperature from Fahrenheit to centigrade or vice-versa.
4. Write a program to select any one from a list. Use combo box to display choices.
5. Write a program to calculate factorial of a given number.
6. Write a program to illustrate the usage of Timer control.
7. Write a program to illustarte the usage of scroll bars.
8. Write a program to illustrate the Drop down menus.
9. Write a program to illustrate the usage of Pop-up menu.
10. Write a program to illustrate the usage of input boxes.
11. Write a program to find smallest of n numbers.
12. Write a program to sort list of numbers.

## SEMESTER V

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U5MCET1A | Elective 1: Optimization Techniques - I | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week** | 5 Hours | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the Students

- To understand the fundamentals of Operations Research.
- To make the students understand solving LPP using various methods.
- To get exposed with various methods to solving transportation problems.
- To understand the assignment problems.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO NO | CO Statements |
|---|---|
| C01 | Define Operations research, Linear Programming problems. |
| C02 | Explain various techniques to solve real life problem expressed in terms of LPP. |
| C03 | Solving LPP using Big in method and Two phase method, Duality and Dual simplex method. |
| C04 | Explain the uses of transportation models and solve transportation problems using various method. |
| C05 | Solving assignment problems using Hungarian methods. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | - | - | ✓ | - | - | - | ✓ | - | - |
| **CO2** | - | - | - | - | - | - | ✓ | ✓ | - | - | ✓ | ✓ |
| **CO3** | - | - | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO4** | - | ✓ | ✓ | - | - | ✓ | - | - | ✓ | - | - | - |
| **CO5** | - | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | ✓ |

**SYLLABUS**

**UNIT I** **(15 Hours)**

Introduction to Operation Research- Modeling in Operation Research-Classification of Models-Advantages and Limitations of Models-Application of Operations Research-Linear Programing Problem-Simplex Method-Graphical Method.

**UNIT II** **(15 Hours)**

Big M Method (Method of Penalities)-Algorithm- Problems – Solving Linear Programming Problem by using Two phase Method-Problems.

**UNIT III** **(15 Hours)**

Duality in Linear Programming-Optimum Dual solution-Mathematical formulation-Solving Linear Programming Problem by Dual Simplex method.

**UNIT IV** **(15 Hours)**

The Transportation Problems- Initial Basic Feasible Solution by North West Corner rule-Least Cost Method-Vogel's Approximation Method-MODI Algorithm for Optimum Solutions-Unbalanced Transportation Problems.

**UNIT V** **(15 Hours)**

The Assignment Problems-Assignment Algorithm-Optimum Solution-Unbalanced Assignment problem-Travelling Salesman Problem.

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | P.K. Gupta and Man Mohan | Problems in Operation Research | Sultan Chand & Sons, New Delhi |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Kanti Swarup, P.K. Gupta and Man Mohan | Operation Research | :Sultan Chand & sons, **New Delhi** |
| 2 | Prof.V.Sundaresan, K.S.Ganapaty Subramanian, K. Ganesan | Resource Management Techniques | A.R. Publications, Chennai |
| 3 | Prem Kumar Gupta D.S, Hira S | Operation Research | Chand & Company Ltd, Ram Nagar, New Delhi |

**WEBSITE REFERENCE**

1.https://www.nptel.ac.in-courses-Webcourse-contents-OPTIMIZATION-METHODS-pdf-Module

2. https://www.mech.iitm.ac.in/nspch.pdf

3. https://www.shodhganga.inflibnet.ac.in/bitstream/10603/11449/.pdf

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER V

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U5MCET1B | Elective 1 : Software Engineering | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week 6 Hours** | 5 Hours | | **Credits3** | 3 |

### COURSE OBJECTIVES

To enable the Students

- To acquire Knowledge about Software Designing and planning a software project.
- To understand estimation of software cost using various techniques.
- To understand how to specify a requirements for a software and design it accordingly.
- To learn about the Guidelines of Software Designing.
- To understand how to verify and validate a software.

### COURSE OUTCOME (CO)

On successful completion of the course, students should be able to

| CO NO | CO Statements |
|---|---|
| C01 | Understand the concepts of software Designing and planning a software project. |
| C02 | Apply the concept of software cost estimation. |
| C03 | Explain the basic concepts of software requirements. |
| C04 | Explain the guidelines of software designing. |
| C05 | Explain debugging and system testing. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | ✓ | ✓ | ✓ | - | - | - | ✓ | - | - | - |
| **CO2** | ✓ | - | - | ✓ | ✓ | - | - | - | - | - | ✓ | - |
| **CO3** | - | ✓ | ✓ | - | ✓ | - | - | - | - | ✓ | - | - |
| **CO4** | - | - | ✓ | ✓ | - | - | - | - | ✓ | - | - | - |
| **CO5** | - | ✓ | - | ✓ | ✓ | - | - | - | - | ✓ | - | - |

### SYLLABUS

**UNIT I** **(15 Hours)**

Introduction to Software Designing- Definitions – Size Factors – Quality and Productivity Factors- Planning a Software Project- Planning the Development Process – Planning an Organizational Structure.

**UNIT II** **(15 Hours)**

Software Cost Estimation- Software cost Factors – Software Cost Estimation

Techniques – Staffing-Level Estimation – Estimating Software Estimation Costs.

**UNIT III** **(15 Hours)**

Software Requirements Definition- The Software Requirements specification – Formal Specification Techniques. Software Design- Fundamental Design Concepts – Modules and Modularization Criteria.

**UNIT IV** **(15 Hours)**

Implementation Issues- Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation Guidelines.

**UNIT V** **(15 Hours)**

Verification and Validation Techniques- Quality Assurance – Walkthroughs and Inspections – Unit Testing and Debugging – System Testing.

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Richard Fairley | Software Engineering Concepts | TMH |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Eve Anderson, Philip Greenspun, Andrew Grumet | Software Engineering for Internet Applications | |
| 2 | Rajib Mall | Fundamentals of Software Engineering | |
| 3 | Stephen Schach | Software Engineering | |

**WEBSITE REFERENCE**

*1.*http://www.google.co.in/url/*?*

*2.http://www.tutorialspoint.com*

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER V

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U5MCET1C | Elective 1 : Linear Algebra | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week** | 6 Hours | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the Students

- To gain knowledge about Linear spaces and their properties.
- To understand the concepts of linear independence, rank and nullity.
- To know about Inner product spaces and verifying their orthogonality.
- To acquire the knowledge of principles of matrix algebra.
- To Know about theory of matrices and a concept of Eigen Values and Eigen vectors**.**

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO NO | CO Statements |
|---|---|
| C01 | Explain the basic concepts of vectorspace, subspace, Linear Transformation and Span of set. |
| C02 | Verify the Linear independence basics and find dimensions, Rank and Nullity of the spaces. |
| C03 | Define Innerproduct space and orthogonality. |
| C04 | Apply the principles of matrix algebra to linear transformations. |
| C05 | Find Eigen values and eigen vectors by using caylry hamilton theorem. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | - |
| **CO2** | - | ✓ | - | - | - | ✓ | - | - | - | - | - | - |
| **CO3** | - | ✓ | - | ✓ | - | ✓ | ✓ | - | - | - | - | - |
| **CO4** | - | ✓ | - | ✓ | - | ✓ | - | - | ✓ | - | - | - |
| **CO5** | - | ✓ | - | ✓ | - | - | - | - | ✓ | - | - | - |

**SYLLABUS**

**UNIT I** **(15 Hours)**

Vector spaces, Definition and Examples – Subspaces – Linear transformation – Span of Set.

**UNIT II** **(15 Hours)**

Linear Independence – Basis and dimensions – Rank and Nullity – Matrix of Linear transformation

**UNIT III** **(15 Hours)**

Inner Product spaces – Definitions and Examples – Orthogonality - Orthogonal complement.

**UNIT IV** **(15 Hours)**

Theory of Matrices – Inverse of Matrix – Elementary Transformations

**UNIT V** **(15 Hours)**

Characteristic equations cayley Hamiton theorem – Eigen Values and Eigen vectors – Properties of Eigen values

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | S.Arumugam, A.T. Issac | Modern Algebra | Scitech Publications |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Vijay K Khanna , SK Bhambri | A Course in abstract algebra | Vikas Publishing House |
| 2 | Kenneth Hoffman, Ray Kunze | Linear Algebra | Phi learning Private limited |
| 3 | Joseph A.Gallian | Contemporary Abstract Algebra, | Narosa Publishing House |

**WEBSITE REFERENCE**

*1.www.linear.axler.net*
*2.http://mathinsight.org*

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER V

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U5MCET2A | Elective 2 : Numerical Methods | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week** | 5 Hours | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the Students

- To make the students understand solving Algebraic and Transcendental Equations.
- To understand the forward and backward difference table.
- To know about how and when to use various interpolation function finding the various numerical differentiation and integration formulae and using them to solve problems.
- To understand the methods of finding solution to the differential equations of various orders.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| CO NO | CO Statements |
|---|---|
| C01 | Solve Algebraic and transcental equations using various methods. |
| C02 | Explain the forward and backward difference tables. |
| C03 | Apply the concept of Interpolation to solve certain problems. |
| C04 | Solve simple problems in Numerical Differentiation and Integration. |
| C05 | Apply various methods to find numerical solution of first and second order differential equations. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | - | - | ✓ | - | - | - | - | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | - | - | - | - |
| **CO3** | - | ✓ | ✓ | - | - | ✓ | - | - | - | - | - | - |
| **CO4** | - | ✓ | ✓ | - | - | ✓ | - | - | ✓ | - | - | - |
| **CO5** | - | ✓ | ✓ | - | - | ✓ | - | - | - | - | ✓ | - |

**SYLLABUS**

**UNIT I** **(12Hours)**

The Solution of Numerical Algebraic and Transcendental Equations - Bisection Method-Regula Falsi Method-Geometrical Interpolation-Newton Raphson Method-Geometrical meaning of Newton's method-Convergence in Newton Raphson Method-Order of convergence of Newton's method- The Solution of Simultaneous Linear Algebraic Equation- Gauss Elimination Method Gauss Jordan Method-Gauss Jacobi Method-Gauss Seidal Method

**UNIT II** **(12 Hours)**

Finite Difference- Differences-Operators-Forward and Backward Difference Tables-Differences of a Polynomial-Factorial Polynomial-Error Propagation in Difference Table.

**UNIT III** **(12 Hours)**

Interpolation(for equal intervals)-Introduction-Linear interpolation-Error in polynomial interpolation-Newton's forward and Backward formulae-Errror in Newton's forward and backward interpolation-Equidistant terms with one or more missing values

**UNIT IV** **(12 Hours)**

Numerical Differentiation-Introduction-Newton's forward and backward formula-Stirling's formula-to find maxima and minima of the function given the tabular values.

Numerical Integration-Introduction-Newton-Cot's formula- Trapezoidal Rule Geometrical interpretation-Truncation error in trapezoidal rule -Simpson's $1/3^{rd}$ and $3/8^{th}$ rules-Truncation error in Simpson rule.

**UNIT V** **(12 Hours)**

Numerical solution of first order-Taylor's series method-Taylor's series for simultaenous first ODE & second ODE -Euler's method-improved Euler method-modified Euler method - Runge kutta method(fourth order only) – Milne's predictor corrector formula-Adam Bashforth predictor corrector formula.

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Kandasamy.P , Thilagavathi.K and Gunavathi.K | NUMERICAL METHODS | S.Chand and Company Ltd, New Delhi |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Dr.S. Arumugam, A.Thangapandi Isaac, Dr. A. Somasundaram | Numerical Methods | Scitech Publications Private Limited Chennai |
| 2 | S. S. Sastry | Introductory Methods of Numerical Analysis | Second Edition Prentice Hall of India Private Limited, New Delhi- |
| 3 | Sandip Banerjee | Topics in Mathematics | Books and Allied Private Limited Kolkata |

**WEBSITE REFERENCE**

*1.http://www.academia.edu*

*2.http://web.ma.utexas.edu*

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

**SEMESTER V**

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U5MCET2B | Elective 2 : Number Theory | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week** | 5 Hours | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the Students

- To know the concepts of prime & Compostite numbers.
- To understand the divisibility of integers and the Euclidean algorithm.
- To understand the concepts of Congruences and the application of Fermat and Wilson theorems.
- To understand the concept of primitive roots and use of legenders theorem.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| **CO NO** | **CO Statements** |
|---|---|
| C01 | Define and interpret the concept of Divisibility, common Divisor, Euclidean algorithm and least common mulitple. |
| C02 | Solving problems in primes and composites numbers. |
| C03 | Understanding the concept of congruences. |
| C04 | Explain theorem of fermat and wilson. |
| C05 | Find primitive roots by using order of a (mod m) and Legendre' theorem. |

**MAPPING WITH PROGRAMME OUTCOMES**

| **CO/PO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | ✓ | - | ✓ | - | - | - | - | ✓ | - |
| **CO2** | - | ✓ | - | - | - | ✓ | - | - | ✓ | - | - | - |
| **CO3** | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| **CO4** | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ |
| **CO5** | - | - | - | ✓ | - | - | - | - | - | - | - | ✓ |

**SYLLABUS**

**UNIT I** **(12 Hours)**

Divisibility: Divisibility of integer- Division Algorithm-Common Dvisor-Greatest Common Divisor-The Euclidean Algorithm-To find the HCF of more that two integer-Least Common Multipe-Worked Examples.

**UNIT II** **(12 Hours)**

Primes and Composite Numbers: Definition of Prime, Composite, Two prime-Euclids Theorem-unique factorization Theorem-To find GCD and LCM of two integers-Positional representation of integers-Worked examples.

**UNIT III** **(12 Hours)**

Congruences: Defnition- Theorems and worked Examples. Linear congruences: Definition-Theorems and worked examples.

**UNIT IV** **(12 Hours)**

Theorem of Fermat and Wilson: Introduction-Fermat Theorem-Another Form of Fermat's Theorem-Euler's Extension of Fermat's Theorem -Worked Examples-Wilson's Theorem-Second proof of Wilson's theorem-Third proof of Wilson's Theorem-Converse of Wilson'd Theorem

**UNIT V** **(12 Hours)**

Primitive Roots: Order of a(mod m)-Theorems-worked Examples-Prmitive roots-Theorems-Legendre's Theorem-Worked Examples

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Kumaravelu and Suseela Kumaravelu | Elements of Nmber Theory | Raja Sankar offset Printers |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Ivan Nivan and Herbert S. Zuckerman | An Introduction to the Theory of Numbers | Wiley Easter ltd -1972. |
| 2 | David M, Burton | Elementary Number Theory | Universal Book stall, New Delhi- 1991 |
| 3 | T. M. Apostol | Introduction to Analytical Number Theory | Springer Verlag |

**WEBSITE REFERENCE**

*1.http://nrich.math.org/4352*

*2.*http://www.academia.edu/29934274/100

*3. http://www.basic-mathematics.com/number-theory.html*

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER V

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U5MCET2C | Elective 2 : Digital electronics and computer fundamentals | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week** | 5 Hours | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the Students

- To understand the number system, conversion of one to the other and various course.
- To acquire Knowledge about Logic circutes and Boolean algebra.
- To know about various Input and Output devices.
- To understand in detail about RAM and REM
- To use the concepts of Boolean algebra solving certain problems.

**COURSE OUTCOME (CO)**

On successful completion of the course, students should be able to

| **CO NO** | **CO Statements** |
|---|---|
| C01 | Define the basic concepts of Number system and to conversion of Binary,Octal,Decimal and Hexadecimal. |
| C02 | Understand the various Logical gates and their truth tables. |
| C03 | Explain the various input and output devices. |
| C04 | Explain about RAM and REM |
| C05 | Solve certain problems using Boolean algebra. |

**MAPPING WITH PROGRAMME OUTCOMES**

| **CO/PO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO2** | - | ✓ | - | - | ✓ | ✓ | - | ✓ | - | - | - | ✓ |
| **CO3** | - | - | - | ✓ | ✓ | ✓ | - | - | - | - | - | - |
| **CO4** | - | ✓ | - | - | ✓ | ✓ | - | - | - | - | ✓ | - |
| **CO5** | - | - | ✓ | - | ✓ | ✓ | - | - | - | - | - | - |

**SYLLABUS**

**UNIT I** **(12 Hours)**

Representation of information Number System and Codes – Binary to Decimal Conversion - Decimal to Binary Conversion – Octal Numbers – Hexadecimal Numbers – ASCII Code – Excess-3 Code – Gray Code

**UNIT II** **(12 Hours)**

Logic circuits: Gates – AND, OR, NOT, NAND and NOR gates – Truth tables –Boolean Algebra – Karnaugh Maps – Product of sum and Sum of product methods – Don"tcare conditions – Multiplexers and Demultiplexers – Flip flops – RS, JK, D, T flip flops –Decoders.

**UNIT III** **(12 Hours)**

Shift Registers – Counters – Arithmetic circuits – Half adder – Full Adder – Half &fullSubtractor – Binary adder &Subtractor – Serial & Parallel Binary Adders – BCD Adder.

**UNIT IV** **(12 Hours)**

I/O devices: Punched tape – Tape readers – Alphanumeric codes – Character recognition – CRT – Output Device : Magnetic tape Output offline Operation – Error detecting and correcting codes – Printers: Dot Matrix, Laser, CRT, Keyboards – Terminals.

**UNIT V** **(12 Hours)**

Semiconductor Memories: ROM – RAM – Static RAM, Dynamic RAM – Magnetic disc memories – Magnetic tape – Digital recording techniques

**Text Books:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Albert Malvino and Donald P Leach | Digital Principles and Applications | Tata Mc Graw Hill Company limited, New Delhi |
| 2 | T.C.Bartee | Digital Computer fundamentals | Tata Mc Graw Hill Company limited, New Delhi |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | S. Salivaganan and S. Arivalagan | Digital Circuits and Design | Vikas Publishing Pvt Ltd |

**WEBSITE REFERENCE**

*1.http://www.ece.uvic.ca*
*2.http://www.digitalocean.com*

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER-V

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title:** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U5NCCT01 | Non Credit Course 3: Aptitude ans Soft Skills I | **Batch** | 2018-2021 |
| | | | **Semester** | V |
| **Hours/week** | 3 Hours | | **Credits** | - |

### COURSE OBJECTIVES

To enable the Students

- To acquire inter personal skills, problem solving skills and be an effective goal oriented team player.
- To equip the students with the required soft skills that would instill confidence and courage in them, to take up new opportunities for their career.
- To know about improving various soft skills required while working in a team.
- To understand the various methods of solving problems involving numerical and logical reasoning.
- To understand the methods of solving certain problems not using calculations but using only mental ability.
- To know how to face the personal interview effectively.

### COURSE OUTCOME (CO)

On successful completion of the course, students should be able to

| CO NO | CO Statements |
|---|---|
| C01 | Apply the inter personal and problem solving skills in the placement drive. |
| C02 | To apply the behavioral skills required for promoting individual competence by implementing the principles of interpersonal communication and value – based living to meet the market expectations. |
| C03 | grasp the approaches and strategies to solve problems with speed and accuracy. |
| C04 | Ability to reason critically by analyzing , elevating and extending arguments. |
| C05 | Explain the concepts deal with graphs,tables,number sequence and texts. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO4** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO5** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |

**Unit I: Soft Skills**

1. Empathy
2. Intrapersonal Skills
3. Interpersonal Intelligence
4. Problem Solving Skills
5. Critical Thinking
6. Aptitude and Assessment Test

**Unit II: Aptitude**

Numerical Reasoning

Mental Ability

Logical Reasoning

**Text Books:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | *Prof .N. Lakshmana Perumal* | *Technical English – I* | *Sri Krishna Hitech Publishing Company (P) Ltd* |
| 2 | *R. S. Aggarwal* | *Quantitative Aptitude for Competitive Examinations,* | English, Paperback |

**REFERENCE BOOK**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Joyce Pereire | Techinical English – II | Vijay Nicole Imprints Pvt.Ltd. |

**WEBSITE REFERENCE**

*1.http://www.indiabix.com*
*2.http://placement.freshersworld.com*

**Means of Curriculum Delivery :** Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER VI

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U6MCCT18 | Title : Core :18:Complex Analysis | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 5 Hours. | | **Credits** | 5 |

### COURSE OBJECTIVES

To enable the students

- To understand the fundamentals of analytical functions, harmonic functions.
- To acquire the knowledge of the concepts of transformations.
- To understand how to evaluate complex integration and derivative of analytic function.
- To understand the concepts of various series and types of singularities.
- To know the methods of evaluating definite integrals.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| C01 | Explain the fundamentals of analytical functions, harmonic functions. |
| C02 | Apply the concepts of transformations. |
| C03 | Apply the concepts of complex integration in cauchy's theroem and derivatives of cauchy's integral formula. |
| C04 | Compute the Taylor's and Laurent's expansions of simple functions. |
| C05 | Find the nature of singularities and residues. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | - | - | - | ✓ | - | - | ✓ | - | - | - |
| **CO2** | - | ✓ | - | ✓ | - | - | - | - | - | - | - | ✓ |
| **CO3** | ✓ | ✓ | - | - | - | - | - | - | - | - | - | ✓ |
| **CO4** | - | - | - | - | ✓ | - | - | ✓ | - | - | - | ✓ |
| **CO5** | - | - | ✓ | - | - | ✓ | - | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(15 Hours)**

Analytic functions- C-R equation – sufficient condition – Harmonic functions.

**UNIT II** **(15 Hours)**

Bilinear transformations – Cross ratio – Fixed points – Transformations which map real axis to real axis - unit circle to unit circle – real axis to unit circle.

**UNIT III** **(15 Hours)**

Complex Integration – Cauchy's Integral theorem – Cauchy's Integral formula – Derivatives of analytic function – Morera's theorem – Cauchy's inequality – Liouville's theorem – Fundamental theorem of Algebra

**UNIT IV** **(15 Hours)**

Taylor's theorem – Taylor's series – Laurent's series – Singular points – Types of singularities - Properties of singular – Properties of Singularities – Indetification of singularities.

**UNIT V** **(15 Hours)**

Argument principle – Rouche's theorem – Calculus of residues – Evaluation of definite Integrals.

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Duraipandian and Laxmi Duraipandian | Complex analysis | Emerald Publications- |

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Shanti Narayanan, Dr.P.K.Mittal | Theory of Functions of a Complex Analysis | S.Chand and company, |
| 2 | S.ponnusamy | foundations of complex analysis, 9th. | narosa publishing house, |
| 3 | S.Arumugam A.Thangapandi Issac, A.Somasundram | ComplexAnalysis, | Scitech Publications |

**WEBSITE REFERENCE**

1. https://www.math.ucdavis.edu/~romik/data/uploads/notes/complex-analysis.pdf

2. https://www.math.lsu.edu/~neubrand/notes.pdf

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER VI

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U6MCCT19 | Title : Core :19: Discrete Mathematics | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 5 Hours. | | **Credits** | 5 |

### COURSE OBJECTIVES

To enable the students

- To make the students to understand the mathematical logic in the concepts of tautology.
- To know about concepts of set theory, relation and function.
- To learn about lattices , their types and groups.
- To understand clearly the concepts of Boolean algebra and formal languages.
- To know about the graph theory and the related problems.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| C01 | Use logically valid forms of arguments to avoid logical errors by studying mathematical logic and learn the formulation of truth table and tautological implications. |
| C02 | Explain the different types of sets and understand the concepts of relation and functions. |
| C03 | Understand the concepts of posets, lattices, boolean algebra and groups. |
| C04 | Explain the concepts of languages and grammers and their types. |
| C05 | Explain the basic definitions of graph theory, types of graphs and trees. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | ✓ | ✓ | - | - | - | - | ✓ | - | - | |
| **CO2** | - | ✓ | - | - | - | ✓ | - | - | - | - | - | ✓ |
| **CO3** | - | ✓ | - | - | ✓ | - | - | - | - | - | ✓ | - |
| **CO4** | ✓ | - | - | - | ✓ | - | - | ✓ | - | - | - | - |
| **CO5** | - | ✓ | - | - | - | ✓ | - | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(12 Hours)**

Mathematical Logic- Statements and Notations - Connectives – Negation - Conjuction - Disjunction - Conditional and bi-Conditional- Well Formed Formulas -Tautology - Equivalence of Formulas - Algebra and Duality.

**UNIT II** **(12 Hours)**

Set Theory- Basic concept of Set Theory- Some Operations on Sets -Venn Diagram.

Relation and Functions - Composition of Relations-Poset-Partial Ordering-Composition of Functions-Inverse Function-One to One Function.

**UNIT III** **(12 Hours)**

Lattices and Algebra Structure - Lattices- Uper bound Lower bound-Types of Lattice(Basic Definition with Examples)-Groups- Permutation Groups, Semi Groups-Coset-Monoids

**UNIT IV** **(12 Hours)**

Boolean Algebra and Formal Languages - Boolean Algebra-Theorems -Boolean Functions- Boolean Expression-Minterm and Maxterm -Languages-Operations on Languages- Regular Expression-Discussion of Grammars-Types of Grammar - PSL, CSL, CFL,RL-Problems.

**UNIT V** **(12 Hours)**

Graph Theory-Basic Definition-Subgraphs-Types of Graphs-Path, Connectedness-wlak and Trail-Matrix Representation-Digraph and Undirected Graph-Trees: Basic Definitions and Examples-Binary trees -Simple Theorems, Problems.

**TEXT BOOK**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | J.K. Sharma | Discrete Mathematics | Macmillan India Ltd |

**REFERENCE BOOKS**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | J.P.Trembly R Manohar | Discrete Mathematical structure with ap[plications to computer science | Mc Graw Hill International Edition, |
| 2 | N.ChandrasekarM. Umaparvathi: | Discrete Mathematics | PHI Learning Private Limited, New Delhi |
| 3 | Narsingh Deo | Graph Theory with applications to engineering and computer science | Prentice Hall of India, New Delhi |

**WEBSITE REFERENCE**

1. https://www.cs.yale.edu/homes/aspnes/classes/notes.pdf
2. https://www.Fhome.iitk.ac.in/~arlal/book/mth202.pdf

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER VI

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U6MCCT20 | Title : Core 20: MATLAB | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 5 Hours. | | **Credits** | 4 |

### COURSE OBJECTIVES

To enable the students

- To know about the basics of MATLAB.
- To understand the method of computation of matrices and vectors.
- To know about solving equations, interpolating values, analyzing data and calculation of statistical concepts.
- To understand clearly solving problems related to numerical integration and differential equations.
- To kow about plotting 2D and 3D images using MATLAB.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| C01 | Explain about basic Matlab windows and commands. |
| C02 | Solve matrix in Matlab. |
| C03 | Find eigen value of matrix, mean and median. |
| C04 | Solve differential equationa and integration using Matlab commands. |
| C05 | Explain to draw graph using 2-D plots and 3-D plots. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | ✓ | ✓ | ✓ | - | - | - | - | - | ✓ | - | - |
| **CO2** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **CO3** | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ |
| **CO4** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ |
| **CO5** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | ✓ | ✓ |

### SYLLABUS

**UNIT I** **(12 Hours)**

Introduction – Basics of MATLAB-MATLAB Windows-Online help-Input-Output, File types-General Commands

**UNIT II** **(12 Hours)**

Interactive Computation - Matrices and Vectors- Matrix and Array Operations-Command line Functions-Using Built in Functions and ON-line Help

**UNIT III** **(12 Hours)**

Applications- Linear Algebra-Curve fitting and Interpolation-Data analysis and Statistics

**UNIT IV** **(12 Hours)**

Numerical Integration-Ordinary Differential Equations-Nonlinear Algebraic Equations.

**UNIT V** **(12 Hours)**

Programming in MATLAB-Scripts and Function-Script Files-Function files-Plotting Simple graphs-Graphics- Basic 2D plots-3D plots.

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Rudra Pratap: | MATLAB- A Quick introduction for Scientists and Engineers | ,Oxford University Press |

**Reference Books:**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | *Rudra Pratap* | *Matlab-7,* | *Oxford University Press, New Delhi-* |
| 2 | *V.Kirani Singh, B.B. Chandhur* | *MATLAB Programming* | *Printice Hall of India Private Limited, New Delhi-* |

**WEBSITE REFERENCE**

1. https://www.mathworks.com
2. https://www.Mathworks.com/matlab central/mathlab/ref/.html

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER VI

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U6MCCP21 | Title : Core 21: MATLAB – Practical | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 3 Hours. | | **Credits** | 2 |

### COURSE OBJECTIVES

To enable the students

- To know how to find a solution for simultaneous equations .
- To understand the method of finding eigen values and eigen vectors for matrix
- To know how to draw a graph for equations.
- To understand clearly how to evaluate the differentiation and integration of equation.
- To understand the method of finding mean, median, mode and standard deviation.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| C01 | Design a solution for given simultaneous equations. |
| C02 | Compute eigen values and eigen vectors for the given matrix. |
| C03 | Draw a graph for given equations using fplot and explot commands. |
| C04 | Compute the differentiation and integration of the given equation. |
| C05 | Compute mean, median, mode and standard deviation for the given matrix. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | - | - | - | - | ✓ | - | - | - | - | - | ✓ |
| **CO2** | - | ✓ | ✓ | - | - | ✓ | - | - | - | - | - | - |
| **CO3** | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - | - | - | - |
| **CO4** | - | ✓ | - | ✓ | - | ✓ | - | - | - | - | - | - |
| **CO5** | - | ✓ | - | ✓ | - | ✓ | - | - | - | - | - | - |

### MAT LAB PRACTICAL LIST

1. Write a program to get a solution for simultaneous equations
2. Write a program to find eigen values and eigen vectors for the given matrix.
3. Write a program to draw graphs using plat and e z plot
4. Write a program to differentiate and integrate the given function.
5. Write a program to find mean, median, mode and standard deviation for the given data.

## SEMESTER VI

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U6MCET3A | Title : Elective 3 : Optimization Techniques – II | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

### COURSE OBJECTIVES

To enable the students

- To understand the application of game theory and queuing theory in real life situation and methods of solving related problems.
- To know about various types of inventories and their control and method of calculating EOQ.
- To know about Network schedualing by PERT/CPM and their calculation.
- To understand the concepts of replacement theory and its application.
- To understand the applications of sequencing and methods of solving related problems.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| C01 | Understanding theory of games. |
| C02 | Apply the fundamental Concept of inventory control |
| C03 | Explain about Network schedualing by PERT/CPM and their calculation. |
| C04 | Solve Replacement Problems |
| C05 | Explain various techniques to solve sequencing problems |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | ✓ |
| **CO2** | ✓ | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | - |
| **CO3** | - | ✓ | - | ✓ | - | ✓ | ✓ | - | - | - | - | ✓ |
| **CO4** | ✓ | ✓ | - | ✓ | - | ✓ | ✓ | - | - | - | - | - |
| **CO5** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(12 Hours)**

Game Theory: Two person zero sum game- The Maxmini- Minimax Principle-Problems-Solution of 2x2 rectangular Games-Domination Property-(2xn) and (mx2) graphical method-Problems.

Queueing Theory- Introduction-Queueing system-Characteristics of Queueing system-Symbols and notations-Classifications of queues-Problems in (M/M/1):(∞/FIFO); (M/M/1):(N/FIFO); (M/M/C): (N/FIFO)- (M/M/C):( ∞ :FIFO)

**UNIT II** **(12 Hours)**

Inventory Control-Types of inventories-Inventory costs-EOQ problem with no shortages-Production problems with no shortages-EOQ with shortages-Production problem with shortages-EOQ with price breaks.

**UNIT III** **(12 Hours)**

Network scheduling by PERT/CPM-Introduction-Network and basic components-Rules of Network construction- Time calculation in Networks -CPM. PERT-PERT calculation – Floats – Independent free float – Total float.

**UNIT IV** **(12 Hours)**

Replacement Problem: Introduction- Replacement of Equipment/asset that deteriorates gradually-Replacement of equipment that fails suddenly and problems.

**UNIT V** **(12 Hours)**

Sequencing Problems: Introduction – Problems of sequencing-Basic terms used in sequencing-Processing n-jobs through 2 machines-processing n-jobs through k machines-processing 2 jobs through k machines.

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | P.K. Gupta and Man Mohan | Problems in Operation Research | Sultan Chand & Sons - |

**Reference Books:**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | *Kanti Swarup, P.K. Gupta and Man Mohan* | *Operation Research:* | *Sultan Chand & sons,* |
| 2 | *Prof. V. Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan* | *Resource Management Techniques* | *A.R. Publications, Chennai* |
| 3 | *Prem Kumar Gupta D.S, Hira S* | *:Operation Research* | *Chand & Company Ltd, Ram Nagar, New Delhi-* |

**WEBSITE REFERENCE**

1.https://www.nptel.ac.in-courses-Webcourse-contents-OPTIMIZATION-METHODS-pdf-Module
2.https://www.mech.iitm.ac.in/nspch.pdf
3. https://www.shodhganga.inflibnet.ac.in/bitstream/10603/11449/.pdf

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

**SEMESTER VI**

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U6MCET3B | Title : Elective 3 : Actuarial Mathematics | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the students

- To understand the basics of probability and interest, calculation of force of mortality and annuities.
- To understand the method of construction of life tables.
- To know about calculation of premium, reserves and problems related to paid – up insurance.
- To understand about the theory of population and its functions.
- To know about the various risk models.

**COURSE OUTCOMES (CO)**

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| C01 | Explain the basics of probability and interest,amortization and Mortage refinancing |
| C02 | Apply the method to construct the life tables. |
| C03 | Solve the problems related to paid – up insurance. |
| C04 | Analyze about population functions and residual life. |
| C05 | Explain about risk models. |

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | - | - | - | ✓ | - | - | - | - | - | ✓ |
| **CO2** | - | ✓ | - | ✓ | - | ✓ | - | ✓ | - | - | - | - |
| **CO3** | - | ✓ | - | ✓ | - | - | - | - | ✓ | - | - | - |
| **CO4** | - | - | ✓ | - | - | ✓ | - | - | - | - | - | - |
| **CO5** | - | ✓ | - | - | ✓ | ✓ | - | - | - | - | - | - |

**SYLLABUS**

**UNIT I** **(12 Hours)**

Basics of Probability and Interest- Probability – Theory of Interest: Variable Interest Rates – Continuous – time payment Streams – Problems. Interest & Force of Mortality- More on Theroy of Interest – Annuities & Actuarial Notation – Loan Amortization & Mortage Refinancing – Illustration on Mortgage of Refinancing – Computational illustration in Splus – Coupon & Zero – Coupon Bonds Force of Mortality & Analytical Models: Comparison of Forces of Mortality – Problems

**UNIT II** **(12 Hours)**

Probability & Life Tables- Interpreting Force of Mortality – Interpolation Between Integer Ages – Binomial Variables & Law of Large Numbers: Exact Probabilities, Bounds & Approximations – Simulation of Life Table Data: Expectation for Discrete Random Variables – Rules for Manipulating

Expectations – Some Special Integrals – Problems. Expected Present Values of Payments-Expected Payment Values : Types of Insurance & Life Annuity Contracts - Formal Relations among Net single Premiums – Formulas for Net Single Premiums – Expected Present values for m=1-Continuous Contracts & Residual Life: Numerical calculations of Life Expectancies – Problems.

**UNIT III** **(12 Hours)**

Premium Calculation- m-Payment Net Single Premiums- Dependence Between Integer & Fractional Ages at Death – Net Single Premium Formulas – two cases. Approximate Formulas via first case – Net Level Premiums – Benefits Involving Fractional Premiums – Problems-Commutation & Reserves: Idea of Commutation Functions: Variable – benefit Commutation Formulas – Secular Trends in Mortality – Reserve & Cash Value of a single Policy: Retrospective Formulas & Identities – Relating Insurance & Endowment Reserves – Reserves under Constant Force of Mortality-Reserves under Increasing Force of Mortality – Recursive Calculation of Reserves – Paid – Up Insurance – Select Mortality Tables & Insurance – Illustration of Communication Columns – Examples on paid – Up Insurance – Problems.

**UNIT IV** **(12 Hours)**

Population Theory- Population Functions & Indicator Notation: Expectation & Variance of Residual life – Stationary – Population Concepts – Estimation Using Life – Table Data – Non stationary Population Dynamics:- Appendix: Large – time Limit of (t;x) – Population Word Problems. Estimation from Life- Table Data- General Life – Table Data - ML Estimation for Exponential Data – MLE for Age Specific Force of Mortality: Extension to Random Entry & Censoring Times – Kaplan – Meier Survial Function Estimator – Problems.

**UNIT V** **(12 Hours)**

Risk Models & Select Mortality-Proportional Hazard Models – Excess Risk Models – Select Life Tables – Problems-Multiple Decrement Models- Multiple Decrement Tables – Death – Rate Estimators- Deaths Uniform within Year of Age – Force of Mortality Constant within Year of Age – Cause – Specific Death Rate Estimators – Single – Decrement Tables and Net Hazards of Mortality – Cause – Specific Life Insurance Premiums - Problems Central Limit Theorem & Portfoio Risks – Problems.

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Eric V.Slud | Actuarial Mathematics and Life – Table Statistics, | Mathematics Department, University of Maryland, College Park |

**Reference Books:**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Jerry Alan veeh | Lecture Notes on Actuarial Mathematics (E-Notes), | |
| 2 | Bowers, N.Gerber, H.Hickman, J.Jones, and Nesbitt | C. Actuarial Mathematics | Society of Actuaries, Itasca, III - |
| 3 | Feller: W | An Introduction to Probability Theroy and its Applications, | |
| 4 | Gerber.H.Life | Insurance Mathematics | |

**WEBSITE REFERENCE**

1. https://www.studocu.com/document/university/actuarial-mathematics
2. https://www.academia.edu/9875397/Lecture_Notes_on_Actuarial_Mathematics

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER VI

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U6MCET3C | Title : Elective 3 :Information Security | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

**COURSE OBJECTIVES**

To enable the students

- To know about what is information security and about the components of information system.
- To know about the various reasons for having a strong security system.
- To understand the legel, ethical and provesional issues in informaton security.
- To understand fully about risk management.
- To chalk out a plan for information security and know about the various information security blue prints.

**COURSE OUTCOMES (CO)**

On successful completion of the course, students should be able to

| **CO NO** | **Statements** |
|---|---|
| C01 | Explain the basic concept of information security and its characteristics |
| C02 | Understand the various reasons for having a strong security system. |
| C03 | Apply the legel, ethical and provesional issues in informaton security. |
| C04 | Apply knowledge in risk management and planning |
| C05 | Apply the concept of security in various technology |

**MAPPING WITH PROGRAMME OUTCOMES**

| **CO/PO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | - | - |
| **CO2** | - | ✓ | - | - | - | ✓ | - | - | - | - | - | ✓ |
| **CO3** | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | - | - | - |
| **CO5** | - | - | ✓ | ✓ | - | ✓ | ✓ | - | - | - | - | ✓ |

**SYLLABUS**

**UNIT I** **(12 Hours)**

Introduction to Information Security- History -What is Security- Critical Characterstics of Information: Availability-Accuracy-Authenticity-Confidentiality-Integrity-Utility-Possession: NSTISSC Security Model- Components of an Information system: Software-Hardware-Data-People-Procedures-Networks.

**UNIT II** **(12 Hours)**

The Need For Security: Introduction-Business Needs:Protecting the fuctionality of Organization-Enabling the Safe Operation of Applications; Threats: Acts of Human Error or Failure-Compromises

to Intellectual Property-Deliberat Acts of Espionage or Trespass; Attacks: Malicious Code-Hoaxes-Back Doors-Password Crack-Spam-Mail Bombing-Snifferes-Social Engineering.

**UNIT III** **(12 Hours)**

Legal, Ethical, and Professional Issues in Information Security: Introduction-Laws and Ethics in Information Security-Types of Law-International Laws and Legal Bodies: European Council Cyber-Crime Convention-Digital Millennium Copyright Act- United Nation Character; Ethics and Information Security: Ethical Difference Across Cultures-Software licence Infringement-Illicit Use-Misuse of Corporate Resources-Ethics and Education; Codes of Ethics and Professional Organizations: Major Professional Organizations for IT-Other Security Organization.

**UNIT IV** **(12 Hours)**

Risk Management: Introduction-An overview of Risk Management; Risk Identification: Asset Identififcation and valuation-Automated Risk Management Rules-Information Asset Classification-Information Asset Valuation-Listing Assets in Order of Importance-Data Classification and Management; Risk Assessment: Introduction to Risk Assesstment-Likelihood Valuation of Information Asset-Risk Determination; Risk Control Strategies: Avoidance-Implementing Avoidance-Transference-Mitigation; Risk Management Discussion Points: Risk Appetite-Residual Risk.

**UNIT V** **(12 Hours)**

Planning for Security: Introduction-Information Security policy, Standard, and Practice: Definition-Enterprise Information Security Policy-Issue Specific Security Policy-System Specific Policy-Policy Management; The Information Security Blueprints: ISO 17799/BS7799-NIST Security Models-IETF Security Architecture-VISA International Security Model; Security Education, Training and Awareness Program; Continuity Strategies: Business Impact Analysis-Incident Responce Planing-Disaster Recovery Planning-Business Continuity Planning

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | E.Michel Whitman, CISSP and Herbert, J. Mattord, CISSP | Principles of Information Security,Thomson Course Technology, | - |

**Reference Books:**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | Mark Rhodes-Ousley | The Complete Reference, Information Security | McGrew Hill Education Private Limited |
| 2 | Thomas R.Pelties | Information Security Fundamentals, BN5. | |

**WEBSITE REFERENCE**

1. www.geeksforgeeks.org
2. *http://www.cisco.com*

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER VI

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U6MCET4A | Title : Elective 4 :Fuzzy Mathematics | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

### COURSE OBJECTIVES

*To enable the students*

- To know about the fuzzy sets and significance of paradigm shift from classical to fuzzy sets.
- To understand the properties of fuzzy sets.
- To know about the various types of operations on fuzzy sets.
- To know fully about fuzzy relations.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| C01 | Understand the basic concept of fuzzy sets and its characteristics |
| C02 | Explain the properties of fuzzy sets |
| C03 | Explain the various types of operations on fuzzy sets |
| C04 | Apply Arithmetic operations in fuzzy sets |
| C05 | Explain the fuzzy relations and its applications |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | - | - | - | - | - | - | - | - | - |
| **CO2** | - | ✓ | ✓ | - | - | - | - | - | - | - | - | ✓ |
| **CO3** | - | ✓ | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | ✓ | - | - | - | - | - | - | - | - | - |
| **CO5** | - | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(12 Hours)**

From classcal sets to Fuzzy sets: Introduction-Crisp Sets: An over vieww-Fuzzy set: Basic types-Fuzzy sets: Basic Concepts-Characteristics and significance of the paradigm Shift

**UNIT II** **(12 Hours)**

Fuzzy sets of versus crisp sets: Addtional properties of α- Cuts- Representations of fuzzy sets- Extension Principle of Fuzzy sets.

**UNIT III** **(12 Hours)**

Operations on fuzzy sets: Types of Operations-Fuzzy complements-Fuzzy Intersections: t-Norms-Fuzzy unions: t-conorms

**UNIT IV** **(12 Hours)**

Fuzzy Arithmetic: Fzzy Numbers-Lnguistic Variables-Arithmetic Operations on intervals

**UNIT V** **(12 Hours)**

Fuzzy Relations: Crisp versus Fuzzy Relations-Projections and Cylndric Extensions-Binary Fuzzy Relations-Binary relations on a single set-Fuzzy Equvalence Relations-Fuzzy Compatibility Relations.

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | George, J.Klir and Tina A, Folger | Fuzzy Sets Uncertanity and Information | Printice Hall of India Pvt Ltd, New Delhi |

**Reference Books:**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | John Yuan, Reza Langari | Fuzzy Logic Intellegence, Control and information, | Pearson Education New Delhi |
| 2 | M.Amirthavalli: | Fuzzy logc and Neural Networks | Scitech Publications Pvt Ltd, Chennai and Hydrabad |
| 3 | Timothy , Jo Ross | Fuzzy Lgic with Engineering Applications, | McGraw-Hill INC, New York |

**WEBSITE REFERENCE**

1. www.iasri.res.in
2. www.tutorialspoint.com/fuzzy-logic

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER VI

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U6MCET4B | Title : Elective 4 : Applied Mathematics | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

### COURSE OBJECTIVES

To enable the students

- To know about the various types of graphs and operations on them.
- To understand the various types of trees and their properties.
- To understand the concepts of finite automata theory and its applications.
- To know about the design techniques in finte automata.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| C01 | Explain the concepts of graph and operations on graph. |
| C02 | Apply the concepts of tree and calculation of the distance in tree. |
| C03 | Explain the concepts of spanning tree. |
| C04 | Explain the concepts of finite automata theory and its applications. |
| C05 | Understand the design techniques in finte automata. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | - | - | ✓ | - | - | - | - | - | - |
| **CO2** | - | ✓ | ✓ | - | - | - | - | - | - | - | - | ✓ |
| **CO3** | - | ✓ | - | - | - | ✓ | - | - | - | - | - | - |
| **CO4** | - | - | ✓ | - | - | - | - | - | - | - | - | - |
| **CO5** | - | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | ✓ |

### SYLLABUS

**UNIT I** **(12 Hours)**

Connected graphs, Disconnected graphs and Components-Euler Graphs-Operation on graphs-More on Euler Graphs

**UNIT II** **(12 Hours)**

Trees: Properties of Trees-Rooted trees-Binary trees- Binary Search Trees- Decision Trees.

**UNIT III** **(12 Hours)**

Spanning Trees: Definition and Properties of Spanning Trees-Algorithm on Spanning Trees-Minimal Spanning Trees-Travelling Salesman Problem-Huffman code.

**UNIT IV** **(12 Hours)**

Basic Notation and Definition-Finite Automata-Deterministic Finite Automata-Simple Notation for Deterministic Finite state Automata (DFA)-Transition table-Language Accepted by DFA-DFA Design Techniques: Pattern Recognition Problems. Non Deterministic Finite state Automata-Moves made by NFA-Transition Function of NFA to string-Language Accepted by NFA-Conversion of NFA to DFA

**UNIT V** **(12 Hours)**

Derivations- Sentences-Languages-Left most derivation-Right most Derivation-Ambiguous Grammar

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | *N. Chandrasekar, M. Umaparvathi* | *Discrete Mathematics,* | *PHI Learning Private Limited* |
| 2 | *Narsingh Deo* | *Graph Theory with applications to engineering and computer science* | *Prentice Hall of India, New Delhi* |
| 3 | *A.M.Padma reddy:* | *Finite Automata and Formal language A simple Approach* | *Sanguine Technical Publishers Bangalore* |

**Reference Books:**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | *Rani Sironmoney* | *Formal language and automata* | *Christian Literary Society,Madras* |
| 2 | *Dr.N.Murugesan* | *Principles of Automata Theory and Computation* | *Sahithi Publication* |
| 3 | *Hopcrot and Ullman* | *Formal Language and their relation Automata* | *Addision Nesley -* |
| 4 | *S.Kumaravelu & Susheela Kumaravelu* | *Graph Theory* | *Janki Calender Corporation, Sivakasi* |

**WEBSITE REFERENCE**

1.http://www.indiabix.com
2.http://placement.freshersworld.com

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER VI

| | | | | |
|---|---|---|---|---|
| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
| **Course Code :** | 18U6MCET4C | Title : Elective 4 : Computer Networks | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 5 Hours. | | **Credits** | 3 |

### COURSE OBJECTIVES

To enable the students

- To know about various types of network, hardware, reference models and comparison between them.
- To understand the various types of transmission and protocols.
- To know about the basic concepts of cryptography and its applications.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| C01 | Explain about the various protocols used in computer networks and hardware |
| C02 | Explain the basic concept of physical layer |
| C03 | Apply the knowledge in data link layer |
| C04 | Apply the algorithms in network layer protocols |
| C05 | Understand the basic concept of cryptography and its applications |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | ✓ | - | ✓ | ✓ | - | - | - | - | - | - | - | - |
| **CO2** | ✓ | ✓ | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | ✓ | ✓ | - | - | - | - | - | - | - | - |
| **CO4** | - | ✓ | - | ✓ | - | ✓ | - | - | - | - | - | - |
| **CO5** | - | ✓ | - | ✓ | - | ✓ | - | - | - | - | - | - |

### SYLLABUS

**UNIT I** **(12 Hours)**

Network Hardware- LAN – WAN – MAN – Wireless – Home Networks. Network Software: Protocol Hierarchies – Design Issues for the Layers – Connection-oriented and connectionless services – Service Primitives – The Relationship of services to Protocols. Reference Models: OSI Reference Model – TCP/IP reference Model – Comparison of OSI and TCP/IP -Critique of OSI and protocols – Critique of the TCP/IP Reference model.

**UNIT II** **(12 Hours)**

Physical Layer - Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. Wireless Transmission: Electromagnetic Spectrum – Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves.

**UNIT III** **(12 Hours)**

Data-Link Layer- Error Detection and correction – Elementary Data-link Protocols – Sliding Window Protocols. Medium-Access Control Sub Layer- Multiple Access Protocols – Ethernet – Wireless LANs - Broadband Wireless – Bluetooth.

**UNIT IV** **(12 Hours)**

Network Layer- Routing algorithms – Congestion Control Algorithms. Transport Layer- Elements of Transport Protocols – Internet Transport Protocols- TCP.

**UNIT V** **(12 Hours)**

Application Layer- DNS – E-mail- Network Security- Cryptography – Symmetric Key Algorithms – Public Key Algorithms – Digital Signatures.

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | *Andrew S. Tanenbaum* | *Computer Networks* | *PHI, Pearson's Prentice Hall-* |

**Reference Books:**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | *Achyut Godbole* | *Data Communication and Networks,TMH* | |
| 2 | | *Computer Networks Protocols, Standards, and Interfaces* | *Uyless Black,* |

**WEBSITE REFERENCE**

1. http://www.geekforgeeks.org
2. http://www.guru99.com

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## SEMESTER VI

| **Programme Code :** | B.Sc. Mathematics (CA) | **Programme Title** | Bachelor of Science Mathematics (CA) | |
|---|---|---|---|---|
| **Course Code :** | 18U6NCCT02 | Title : Non Credit Course 4 : Aptitude and Soft Skills II | **Batch** | 2018-2021 |
| | | | **Semester** | VI |
| **Hours/week** | 3 Hours. | | **Credits** | - |

### COURSE OBJECTIVES

To enable the students

- To acquire inter personal skills, problem solving skills and be an effective goal oriented team player.
- To equip the students with the required soft skills that would instill confidence and courage in them, to take up new opportunities for their career.
- To know about improving various soft skills required while working in a team.
- To understand the various methods of solving problems involving numerical and logical reasoning.
- To understand the methods of solving certain problems not using calculations but using only mental ability.
- To know how to face the personal interview effectively.

### COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

| CO NO | Statements |
|---|---|
| C01 | Apply the inter personal and problem solving skills in the placement drive. |
| C02 | To apply the behavioral skills required for promoting individual competence by implementing the principles of interpersonal communication and value – based living to meet the market expectations. |
| C03 | grasp the approaches and strategies to solve problems with speed and accuracy. |
| C04 | Ability to reason critically by analyzing , elevating and extending arguments. |
| C05 | Explain the concepts deal with graphs,tables,number sequence and texts. |

### MAPPING WITH PROGRAMME OUTCOMES

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO2** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO3** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO4** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |
| **CO5** | - | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | ✓ | - | ✓ |

**SYLLABUS**

**Unit I:** E- Materials

Interactive Exercises for Grammar and Vocabulary

Audio/Video Excerpts of different Accents

Interpreting Posters

**Unit II: Aptitude**

1. Numerical Reasoning
2. Mental Ability
3. Logical Reasoning

**Text Book:**

Recent editions of the following books only are recommended

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | *Prof .N. Lakshmana Perumal* | *Technical English – I* | *Sri Krishna Hitech Publishing Company (P) Ltd* |
| 2 | *R. S. Aggarwal* | *Quantitative Aptitude for Competitive Examinations,* | English, Paperback |

**Reference Books:**

| S. No. | Author Name | Title of the Book | Publisher |
|---|---|---|---|
| 1 | *Joyce Pereire* | *Technical English – II* | *Vijay Nicole Imprints Pvt.Ltd.* |

**WEBSITE REFERENCE**

*1.http://www.indiabix.com*
*2.http://placement.freshersworld.com*

**Means of Curriculum Delivery** : Lecture, Group Learning, Seminar, Assignment, Google classroom.

## சுற்றுலா வளர்ச்சி

**Subject Code: 2018ECC001** **No. of Credits: 2**

### அலகு I

1. சுற்றுலா – ஒரு விளக்கம்
2. உலக நாடுகளில் சுற்றுலா வளர்ச்சி
3. பாரதத்தில் சுற்றுலா வளர்ச்சி

### அலகு II

1. தமிழ்நாட்டில் சுற்றுலா வளர்ச்சி
2. பன்னாட்டு பலவகைப் பயணிகள்
3. சுற்றுலாவின் சமுக பொருளாதார விளைவுகள்

### அலகு III

1. சுற்றுலாப் பயணிகள் பற்றிய புள்ளி விவரங்கள்
2. சுற்றுலாவைத் திட்டமிடுதலும் மேம்படுத்தலும்
3. சுற்றுலா விடுதிகள்

### அலகு IV

1. சுற்றுலாப் பயணிகளின் பல்வேறு போக்குவரத்துகள்
2. சுற்றுலாக் கழகங்கள்
3. சுற்றுலாப் பயண முகவர்கள்

### அலகு V

1. சுற்றுலாவின் வணிகச் சந்தைகள்
2. சுற்றுலாவின் வழிகாட்டிகள்
3. தமிழ் இலக்கியத்தில் பயணநூல்கள்

**பாடநூல்** : சுற்றுலா வளர்ச்சி

**ஆசிரியர்** - வெ. கிருட்டிணசாமி

மணிவாசகர் பதிப்பகம்

சென்னை,

ஆகஸ்டு - 2009

# இதழியல் கலை

**Subject Code: 2018ECC002** **No. of Credits: 2**

## அலகு I இதழியல் - இயல்பும் பரப்பும்

1. இதழியல் விளக்கம்.
2. இதழ்களின் பணிகள், கடமைகள், பொறுப்புகள்.
3. இதழ்கள் வகைகளும் இயல்புகளும்.
4. மக்களாட்சியில் இதழியல்.
5. இதழ்களின் சுதந்திரம்.
6. இதழியல் நடத்தையறக் கட்டளைகள்.
7. இதழியல் தொழில் வாய்ப்புகள்.

## அலகு II இதழியல் தோற்றமும் வளர்ச்சியும்

1. இதழியல் வளர்ச்சி
2. தமிழகத்தில் இதழியல் வளர்ச்சி
3. பத்திரிக்கைச் சட்டங்கள்
4. பத்திரிக்கை மன்றம்

## அலகு III இதழ்களின் அமைப்பு முறை

1. இதழ்கள் தொடங்குவதற்கான வழிமுறைகள்
2. செய்தித்தாள் நிர்வாக அமைப்பு

## அலகு IV செய்திகள், சேகரித்தல், எழுதுதல்

1. செய்தியாளர்
2. செய்தி
3. செய்தியின் உள்ளடக்கங்கள்
4. செய்தி திரட்டுதல்
5. செய்தி நிறுவனங்கள்
6. பேட்டி
7. குற்றச் செய்திள்
8. பல்வேறு வகையான செய்திகள்
9. செய்திகளும் சிறப்புத்தனி இயல்புகளும்
10. படங்களும் இதழ்களும்

## அலகு V செப்பனிடுதல் (பதிப்பித்தல்)

1. செய்திகளைச் செப்பனிடுதல் - நுட்பங்கள்
2. ஆசிரியர்
3. செய்தி ஆசிரியர்
4. துணை ஆசிரியர்
5. செய்தியின் கட்டமைப்பு
6. பக்க வடிவமைப்பு
7. அச்சுப்படி திருத்துதல்
8. இதழியல் கலைச் சொற்கள்

**பாடநூல் :** இதழியல் கலை

**ஆசிரியர்** : டாக்டர் மா.பா. குருசாமி

ஸ்ரீ சக்தி ∴பைன் ஆர்ட்ஸ்

சிவகாசி

ஜனவரி – 2009.

## நாட்டுப்புறவியல்

**Subject Code: 2018ECC003** **No. of Credits: 2**

### அலகு I

நாட்டுப்புற இயல் என்றால் என்ன?

நாட்டுப்புற இயலின் வரலாறு

நாட்டுப்புற அயல் கல்வி – ஒரு விளக்கம்

### அலகு II

நாட்டுப்புற ஆடல்கள்

நாட்டுப்புற கூத்துகள்

நாட்டுப்புற கைவினைக் கலைகள்

### அலகு III

நாட்டுப்புற விளையாடல்கள்

நாட்டுப்புற மருத்துவம்

நாட்டுப்புற நம்பிக்கைகள்

### அலகு IV

நாட்டுப்புற வழிபாடுகள்

நாட்டுப்புறக் கதைகள்

நாட்டுப்புறப் பாடல்கள்

கதைப்பாடல்கள்

### அலகு V

விடுகதைகள்

பழமொழிகள்

புராணங்கள்

**பாடநூல்** : நாட்டுப்புறவியல்

**ஆசிரியர்** : சு. கண்முக சுந்தரம்

காவ்யா பதிப்பகம்,

ஏப்ரல் - 2017.

## கணிப்பொறியில் தமிழ்

**Subject Code: 2018ECC004** **No. of Credits: 2**

### அலகு I

கணிப்பொறியில் தமிழ்

விசைப்பலகை அமைப்பு முறைகள்

எழுத்துருவின் வகைகள்

### அலகு II

தமிழ் எழுத்துருக்கள்

எழுத்துரு / விசைப்பலகை இயக்கியை நிறுவுதல்

### அலகு III

தமிழில் தட்டச்சு செய்யும் முறை

சிக்கல்களும் தீர்வுகளும்

### அலகு IV

இணையத்தில் தமிழ்

தமிழ் இணையப் பல்கலைக்கழகம்

மின்னஞ்சல்

### அலகு V

யூனிக்கோடு

வின்டோஸ் எக்ஸ்பீயில் தமிழ்

தமிழ் இணையதளங்கள்

**ஆசிரியர்** : த. பிரகாஷ்

பெரிகாம் நூல் வெளியீடு மற்றும் விற்பனை

ஆகஸ்டு – 2007.

## தமிழக வரலாறும் மக்கள் பண்பாடும்

**Subject Code: 2018ECC005** **No. of Credits: 2**

### அலகு I

1. தமிழக வரலாற்றுக்கான அடிப்படை ஆதாரங்கள்
2. தமிழகத்தின் இயற்கை அமைப்புகள்.
3. வரலாற்றுக் காலத்துக்கு முந்திய தமிழகம்.
4. சிந்து வெளி அகழ்வாராய்ச்சி.

### அலகு II

1. பண்டைய தமிழரின் அயல்நாட்டு தொடர்புகள்
2. தமிழ் வளர்த்த சங்கம்
3. சங்க இலக்கியம்
4. பண்டைய தமிழரின் வாழ்க்கை

### அலகு III

1. களப்பிரர்கள்
2. பல்லவர்கள்
3. தமிழகத்தில் நான்காம் நூற்றாண்டு முதல் ஒன்பதாம் நூற்றாண்டு வரையில் சமூக நிலை.

### அலகு IV

1. சோழப் பேரரசின் தோற்றம்.
2. சோழப் பேரரசின் வளர்ச்சியும் வீழ்ச்சியும்.
3. சோழர் காலத்தில் தமிழரின் சமுதாயம்.
4. பாண்டியரின் ஏற்றமும் வீழ்ச்சியும்.

### அலகு V

1. மதுரை நாயக்கர்கள்.
2. தமிழகத்தில் 13 முதல் 18 ஆம் நூற்றாண்டு வரை சமூகநிலை
3. ஐரோப்பியரின் வரவு.
4. 19 ஆம் நூற்றாண்டின் அரசியலும் தமிழகத்தின் சமூக நிலையும்.
5. 20 ஆம் நூற்றாண்டில் தமிழகம் மேற்கோள் நூல்கள்.

**பாடநூல் :** தமிழக வரலாறும் மக்கள் பண்பாடும்

**ஆசிரியர் -** கே. கே. பிள்ளை.

உலகத் தமிழாராய்ச்சி நிறுவனம்.

செப்டம்பர் - 2016.

## தமிழ் இலக்கிய வரலாறு

**Subject Code: 2018ECC006** **No. of Credits: 2**

### அலகு I

1. காலப்போக்கில் கன்னித்தமிழ் ஒரு கண்ணோட்டம்
2. தமிழ்ச்சங்கம் 3. அகத்தியர்
4. தொல்காப்பியர் 5. சங்க இலக்கியம்
6. பதினெண் கீழ்கணக்கு

### அலகு II

1. இரட்டைக் காப்பியங்கள் 2. நாயன்மார்கள் 3. ஆழ்வார்கள்
4. சமயமும் தமிழும் (பௌத்தம், சமணம், சைவம், வைணவம்)
5. கன்னித் தமிழ் காப்பிய வளர்ச்சி 6. புராணங்களும் பிறவும்.

### அலகு III

1. சிற்றிலக்கியங்கள். 2. பதினெண் சித்தர்கள். 3. உரையாசிரியர்கள்.
4. பிற்காலப் புலவர்கள். 5. கிருத்துவமும் தமிழும். 6. இஸ்லாமியமும் இன்தமிழும்.

### அலகு IV

1. சோழப் பேரரசின் வளர்ச்சியும் வீழ்ச்சியும். 2. கவிஞர் பெருமக்கள்.
3. புதக்கவிதை. 4. உரைநடை இலக்கியம், சிறுகதை இலக்கியம்.

### அலகு V

1. தமிழ் நாவல் இலக்கியம். 2. தாளிகைகள்.
3. இசைத்தமிழ் வரலாறு. 4. நாடகத் தமிழ் வரலாறு
5. 20 ஆம் நூற்றாண்டில் இன்தமிழ் வளர்ச்சி. 6. பிற நாடுகளில் பைந்தமிழ்

**பாடநூல்** : தமிழ் இலக்கிய வரலாறு

**ஆசிரியர்** : பேராசிரியர் மது.சா. விமலானந்தம்

முல்லைநிலையம்,

சென்னை, 2018

## New Media

**Subject Code: 2018ECC007** **No. of Credits: 2**

**Objectives :**

To enable the students to understand the new age media sources.

**UNIT I:**

Spread of Internet; Salient features and advantage over traditional media; History and spread of internet in India, reach and problem of access; Internet and Knowledge Society; Convergence and Multi-media: Print, radio, TV, internet and mobile.

**UNIT II:**

Online journalism; Earlier websites of newspapers, E-books and E-publishing Status of online journalism today.

**UNIT III:**

Digital storytelling: Tools of multimedia journalists; Learn to report, write and produce in a manner that is appropriate for online media; Feature writing for online media: Story idea, development and news updates.

**UNIT IV:**

Open source journalism: Responding to the audience, Annotative reporting; Citizen Journalists, Problem of verification, accuracy and fairness.

**UNIT V:**

Use of blogs, tweets, etc. for story generation and development; Protecting copyright, Exploring Cyberspace: Individual Blog; Group weblog

**TEXT BOOKS:**

1.Jagdish Chakravarthy, Net, Media and the Mass Communication,Authors press, New Delhi,2004.

2. Gopal Bhargava ,Mass Media and Information Revolution,Isha Books, New Delhi ,2004.

**REFERENCE BOOKS:**

1.Nath, Shyam ,Assessing the State of Web Journalism ,Authors Press, New Delhi,2002.

2.Narayana Menon, The Communication Revolution.National Book Trust ,1976.

## Proofreading and Copyediting

**Subject Code: 2018ECC008** **No. of Credits: 2**

**Objectives**

To enable the students to proofread and edit texts.

**UNIT I:**

Introduction to Proofreading and Copyediting, The use of style sheets and style guides in Proofreading and copyediting, finding the appropriate style guides, how to create and use a style sheet.

**UNIT II:**

Proofreaders' marks and how they are used to copyedit and proofread, your job as a proofreader.

**UNIT III:**

How to proofread, Proofreading practice.

**UNIT IV:**

The job of copyediting, how to copyediting, copyediting practice.

**UNIT V:**

How to copyedit or proofread one's own Work, copyediting or proofreading as a career.

**TEXT BOOKS:**

1. Laura Anderson ,Proofreading Handbook ,McGraw-Hill ,2nd Edition2006.
2. Elsie Myers Stainton, The Fine Art of Copyediting ,Columbia University Press ,2002.

**REFERENCE BOOKS:**

1. Suzanne Gilad ,Copyediting and Proofreading For Dummies ,1st Edition 2011

2. Peter Ginna ,What Editors Do: The Art, Craft, and Business of Book Editing (Chicago Guides to Writing, Editing, and Publishing) ,University of Chicago Press ,2017

## Personality Development

**Subject Code: 2018ECC009** **No. of Credits: 2**

**Objectives :**

To make students groom their personality and prove themselves as good Samaritans of the society

**UNIT I:**

Introduction to Personality Development ; The concept of personality, Theories of Freud & Erickson, Significance of personality development; The concept of success and failure: What is success-Hurdles, What is failure- Causes of failure.

**UNIT II:**

Attitude & Motivation, Factors affecting attitudes-Positive attitude, Advantages, Negative attitude-Disadvantages - Concept of motivation - Significance – Internal and external motives -Importance of self- motivation-Factors leading to de-motivation

**UNIT III:**

Term self-esteem, Symptoms, Advantages - Do's and Don’ts to develop positive self-esteem, Low selfesteem, Symptoms - Personality having low self esteem - Positive and negative self esteem. Interpersonal Relationships.

**UNIT IV:**

Other Aspects of Personality Development, Body language - Problem-solving - Conflict and Stress Management - Decision-making skills -Leadership and qualities of a successful leader – Character building -Team-work – Time management - Work ethics –Good manners and etiquette.

**UNIT V:**

Employability Quotient , Resume building- The art of participating in Group Discussion – Facing the Personal (HR & Technical), Interview, Psychometric Analysis, Mock Interview Sessions.

**TEXT BOOKS:**

**1.E.B. Hurlock ,Personality Development ,Tata McGraw Hill ,28th Reprint. New Delhi: 2006**

2. Stephen P. Robbins and Timothy A. Judge ,Organizational Behavior ,Prentice Hall. 16th Edition, 2014.

**REFERENCE BOOKS:**

1. Sudhir Andrews , How to Succeed at Interviews, New Delhi.Tata McGraw-Hill ,21st (rep.) 1988

2. Heller, Robert., Effective leadership, Essential Manager series. Dk Publishing,2002.

## Technical Writing

**Subject Code: 2018ECC010** **No. of Credits: 2**

**Objectives :**

To enable the students to practice professional writing.

**UNIT I:**

Technical Writing Basics, Technical Communication: Definition & Purpose.

**UNIT II:**

Characteristics of Technical Communication, Audience, Centered Communication.

**UNIT III:**

Legal and Ethical Communication: Description & Importance, Implicit and Explicit Rules of Communication: Definitions & Examples.

**UNIT IV:**

Types of Technical Documents.

**UNIT V:**

The Technical Writing Process: Prewriting, Writing & Rewriting, Spread of Internet; Salient features and advantage over traditional media.

**TEXT BOOKS:**

1. Kieran Morgan , Technical Writing Process: The simple, five-step guide that anyone can use to create technical documents such as user guides, manuals, and procedures , Better on paper publications , 2015

2. Thomas Arthur Rickard ,A Guide to Technical Writing ,Bibliolife, 2008.

**REFERENCE BOOKS:**

1. Gerald J. Alred, Charles T. Brusaw & Walter E. Oliu , Handbook of Technical Writing ,Bedford/St. Martin's ,2008.

2. Mike Markel, Technical Communication, Palgrave MacMillan ,2012

## An Introduction to Psychology

**Subject Code: 2018ECC011** **No. of Credits: 2**

**Objectives :**

To enable the students to articulate how psychological research adheres to ethical and scientific principles, and communicate the difference between personal views and scientific evidence in understanding behavior.

**UNIT I:**

Introducing Psychology, Psychological Science, Brain, Body and Behavior.

**UNIT II:**

Sensing and Perceiving Remembering and Judging, Intelligence and Language.

**UNIT III:**

States of Consciousness, Growing and Developing, Learning.

**UNIT IV:**

Emotions and Motivation, Personality

**UNIT V:**

Defining Psychological Disorders, Treating Psychological Disorders, Psychology in Our Social Lives.

**TEXT BOOKS:**

1. David Myer , David Myer's Psychology , Worth Publishers ,(7th ed.) 2004.
2. Daniel Kahneman, Thinking Fast and Slow , Farrar , Straus and Giroux , 2011

**REFERENCE BOOKS:**

1. Roger R. Hock, Forty Studies That Changed Psychology , Prentice hall ,2008.

2. Robert Feldman, Understanding psychology, McGraw Hill Education, 2017

3.Thomas E. Ludwig , Psychsims ,WortSh Publishers ,2004

# ASTRONOMY

**Subject Code: 2018ECC012** **No. of Credits: 2**

**Objectives:**

On successful completion of this course the students should gain knowledge about Astronomy.

**UNIT I:**

General description of the Solar system. Comets and meteorites – Spherical trigonometry.

**UNIT II:**

Celestial sphere – Celestial co – ordinates – Diurnal motion – Variation in length of the day.

**UNIT III:**

Dip – Twilight – Geocentric parallex.

**UNIT IV:**

Refration – Tangent formula – Cassinis formula.

**UNIT V:**

Kepler's laws – Relation between true eccentric and mean anamolies.

**Text Book**

"ASTRONOMY" by S.Kumaravelu and Susheela Kumaravelu.

## FUZZY MATHEMATICS

**Subject Code: 2018ECC013** **No. of Credits: 2**

**Objective:**

- To know the basic concepts of fuzzy stes and its characteristics.
- To understand the concept of various operations on fuzzy sets.
- To learn the concept of fuzzy relations and its applications.

**UNIT I**

From classcal sets to Fuzzy sets: Introduction-Crisp Sets: An over vieww-Fuzzy set: Basic types-Fuzzy sets: Basic Concepts-Characteristics and significance of the paradigm Shift

**UNIT II**

Fuzzy sets of versus crisp sets: Addtional properties of $\alpha$- Cuts- Representations of fuzzy sets-Extension Principle of Fuzzy sets.

**UNIT III**

Operations on fuzzy sets: Types of Operations-Fuzzy complements-Fuzzy Intersections: t-Norms-Fuzzy unions: t-conorms

**UNIT IV**

Fuzzy Arithmetic: Fzzy Numbers-Lnguistic Variables-Arithmetic Operations on intervals

**UNIT V**

Fuzzy Relations: Crisp versus Fuzzy Relations-Projections and Cylndric Extensions-Binary Fuzzy Relations-Binary relations on a single set-Fuzzy Equvalence Relations-Fuzzy Compatibility Relations.

**Text Book:**

Fuzzy Sets Uncertanity and Information, George, J.Klir and Tina A, Folger, Printice Hall of India Pvt Ltd, New Delh, 2006

**UNIT I:** Page no: 1-30

**UNIT II:** Page no: 35-48

**UNIT III:** Page no: 50-96

**UNIT IV:** Page no: 97-102

**UNIT V:** Page no: 119-135

**Reference Book:**

1. Fuzzy Logic Intellegence, Control and information, John Yuan, Reza Langari, Pearson Education, New Delh, 1999
2. Fuzzy logc and Neural Networks, M.Amirthavalli, Scitech Publications Pvt Ltd, Chennai and Hydrabad, 2007
3. Fuzzy Lgic with Engineering Applications, Timothy , Jo Ross, McGraw-Hill INC, New York, 1996.

## OPERATION RESEARCH

**Subject Code: 2018ECC014** **No. of Credit :2**

**Objectives:**

To understand the basic concepts of Operations Research and Solving LPP
To solve Transportation and Assignment problems
To understand the concept of Game theory , Queuing theory PERT and CPM.

**UNIT I**

Introduction to Operations Research - Meaning - Scope – Models - Limitation. Linear Programming - Formulation – Graphical method only.

**UNIT II**

Transportation (Non- degenerate only) - Assignment problems - Problems.

**UNIT III**

CPM - Principles - Construction of Network for projects – Types of Floats – Slack- crash programme.

**UNIT IV**

PERT - Time scale analysis - critical path - probability of completion of project - Advantages and Limitations.

**UNIT V**

Game Theory: Graphical Solution – mx2 and 2xn type. Solving game by Dominance property - fundamentals - problems . Replacement problem – Replacement of equipment that deteriorates gradually (value of money does not change with time).

**Text Book:**

*Prof. V. Sundaresan., K.S. Ganapathy Subaramanian ., K.Ganesan: Resource Management Techniques ( Operations Research) A.R.Publications- 2002*

**Unit I :** Chapter 1 – Section 1.1,1.2,1.4,1.9, Chapter 2 – Section 2.1- 2.5
**Unit II :** Chapter 7 – Section 7.1- 7.2, Chapter 8 – Section 8.1 ,8.2,8.4,8.5
**Unit III :** Chapter 15 – Section 15.1,15.2,15.5,15.8
**Unit IV :** Chapter 15 – Section 15.6
**Unit V :** Chapter 16 – Section 16.6, 16.7, Chapter 11 – Section 11.1, 11.2

**Reference:**

1. Kanti Swarup, Gupta P.K, Man Mohan : Operations Research, Sultan Chand & Sons- 1997
2. P.R. Vittal and V.Malini : Operations Research, Margham Publications -2011.
3.P.K.Gupta.,ManMohan: Problems in Operations Research,Sultan Chand &sons-2004
4.V.K.Kapoor: Operations research, Sultan Chand&sons-2007

## MATHEMATICS FOR PROFESSIONAL COURSES

**Subject Code: 2018ECC015** **No. of Credits: 2**

**OBJECTIVES**

To understand the fundamental concepts of Set Theory and Linear Equations.
To solve the problems in Mathematics of Finance, sequence and series.
To acquire the knowledge of correlation, regression and problem solving.

**UNIT I:**

Sets, Functions and Relations -Equations Linear equations–Homogeneous linear equations .

**UNIT II:**

Sequence and Series–Arithmetic progression-Geometric progression; Mathematics of Finance: Simple interest-Compound interest.

**UNIT III:**

Limits ─ Basic concepts of Differentiation - Integration

**UNIT IV:**

Measures of Central Tendency and Dispersion, Arithmetic Mean, Median – Mode, Geometric Mean and Harmonic Mean, Standard deviation, Quartile deviation

**UNIT V:**

Correlation and Regression.

**Text Book:**

1. Discrete Mathematics, B.S. Vatssa, Wishwa Prakashan Private Limited, 3rd Edition.
2. Business Mathematicsc and Statistics, P.A. Navanitham, Jai Publisher, June 2004.

**Reference Book:**

1 .Dr.M.K.Venketaramen,Dr.N.Sridharan,N.Chandarasekaran: DiscreteMathematics The National publishing Company – 2006.
2.P.R.Vittal :Business Mathematics and Statistics, Margham Publications.-2011
3. Sanchetti, D.C and Kapoor, V.K: Business Mathematics, Sultan chand Co & Ltd-2002.

**Unit I:** Chapter 2 and 3, chapter 7, 7.1-7.4 (Text Book 1)
**Unit II:** Chapter 1 and 2 (Text Book 2, Part 1)
**Unit III:** Chapter 5, 6 and 8 (Text Book 2, Part 1)
**Unit IV:** Chapter 7 (Text Book 2, Part 2)
**Unit V:** Chapter 12 and 13 (Text Book 2, Part 2
**Chapter 3 , Section 3.1-3.4 and Chapter 6, Section 6.1-6.3 (Text Book 3)**

## MULTIMEDIA AND ITS APPLICATIONS

**Subject Code: 2018ECC016** **No.of Credits: 2**

**Objectives:**

To enable the students learn the overview of Multimedia systems.
To provide knowledge about the Basic concepts of Sound and Image Processing.
To enhance the knowledge about the Multimedia Applications.

**UNIT I**

Media and Data Streams : Medium – Main Properties of a Multimedia Systems – Multimedia – Traditional Data Streams Characteristics – Data Streams characteristics for continuous media.

**UNIT II**

Sound / Audio: Basics sound Concepts – Music – Speech . Video and Animation : Basics concepts – Television – Computer Based Animations.

**UNIT III**

Images and Graphics : Basics concepts – Computer Image Processing – Data Compression : Storage space – coding requirement – source entropy and hybrid coding – some basic compression techniques – JPEG – MPEG – DVI.

**UNIT VI**

Multimedia Communication system : Application subsystem – Transport subsystem – quality of services and resource management.

**UNIT V**

Multimedia Applications : Introduction – Media Preparation – Media Composition – Media Integration – Media Communication – Media Entertainment.

**Reference Books:**

1. Ralf Steinmetz and Klara NaHourstedt , Multimedia : Computing , Communication & Applications. ,Pearson Education.

## MANAGEMENT INFORMATION SYSTEM

**Subject Code: 2018ECC017** **No. of Credits:**

**Objectives:**
To familiarise the students with Business Information through Computers.
To enable the students aware of utilization of business information for decision making.
To bestow knowledge about Database Management System

**UNIT I**

Management information system: meaning – features – requisites of effective MIS – MIS Model – components – subsystems of an MIS – role and importance – corporate planning for MIS – growth of MIS in an organization – centralization vs decentralization of MIS - Support – Limitations of MIS.

**UNIT II**

System concepts – elements of system – characteristics of a system – types of system – categories of information system – system development life cycle – system enhancement.

**UNIT III**

Information systems in business and management: Transaction processing system: Information repeating and executive information system.

**UNIT IV**

Database management systems – conceptual presentation – client server architectures networks.

**UNIT V**

Functional management information system: Financial – accounting – marketing – production – Human resource – business process outsourcing.

**Text Books:**

1. Gorden B.Davis and Margrethe H.Olson: “Management Information System”, Tata McGraw Hill Publication, New Delhi, 1st Edition, 2005.
2. Aman Jindal: “Management Information system”, Kalyani Publishers, New Delhi, First Edition, 2004.

**Reference Books:**

1. Kenneth C. Laudon: “Management Information System”, Pearson Education, New Delhi, First Edition, 2004.
2. Stephen Haag: “Management Information System”, Tata McGraw Hill Publication, New Delhi, First Edition, 2008.

## THEORY OF COMPUTATION

**Sub Code: 2018ECC018** **No. of Credits: 2**

**Objectives:**

To learn about the basic of theory of computing
To understand the concept of finite automata and push down automata
To acquire knowledge in formal language
To enhance the concept of conversion of deterministic automata to non deterministic automata.

**UNIT- I**

Introduction to theory of Computing – Why Study the theory of Computing- What is Computation- Set theory-Alphabets-Strings and Languages-Relations-Functions-Graphs and Trees.

**UNIT -II**

Finite Automata: Introduction-Finite state Machines -Deterministics Finite Automata(DFA)-Finite Automata with and without Epsilon Transitions-Language of Deterministic Finite Automata-Acceptability of a String by a Deterministic Finite Automata-Processing of Strings by Deterministic Finite Automata;Non-Deterministic Finite Automata(NFA)- Language of Non- Deterministic Finite Automata-Equivalence between DFA and NFA-Non Deterministic Automata with or without Epsilon Transitions.

**UNIT -III**

Formal Language: Introduction-Theory of Formal Language-Kleene and positive Closure-Defininig Language-Recursive Definition of Language-Arithmetic Expression-Grammar-Classification of Grammar and Language-Language and their Relation-Operations On Language-Chomsky Hierrachy.

**UNIT- IV**

Regular Language: Introduction-Regular Language and Expression-Operations of Regular Expression-Identity Rules-Algebraic Laws for Regular Expression-Finite Automata and Regular Expression- Kleene's Theorem-Problems-Context Free Grammar and Context Free Language: Introduction-Derivation Tree-Parse Tree-Right Most and Left most Derivation -Ambiguity-Problems

**UNIT- V**

Push Down Automata: Description and Definition-Language of PDA-Graphical Notation of PDA-Acceptance by Final State and Empty Stock, From Empty Stock to Final State and Vice versa-Deterministic Pushdown Automata and Non deterministic Pushdown Automata-Language-Problems.

**Text Books:**

1. Theory of Computing-A Gentle Introduction, Efim Kinber, Carl Smith, published by Pearson Education.(UNIT 1)
2. Theory of Automata, Language & Computation, Rajendra Kumar, Tata McGraw Hill Education Private Limited, New Delhi. (UNIT 1to 5)

**Reference Book:**

A Textbook Automata Theory, S.F.B.Nasir, P.K.Srimani, Published by Cambridge University Press India Pvt, Ltd, New Delhi.

**UNIT I:** Chapter 1: Section 1.1, 1.2 (Text Book 1)
Chapter 1: Section 1.1-1.6 (Text Book 2)
**UNIT II:** Chapter 2: Section 2.1-2.11
**UNIT III:** Chapter 3: Section 3.1-3.10
**UNIT IV:** Chapter 4: Section 4.1-4.5, 4.6, 4.6.1, 4.6.2
Chapter 6: Section 6.1-6.10
**UNIT V:** Chapter 7: Section 7.1-7.10

## OOPS WITH JAVA PROGRAMMING

**Subject Code: 2018ECC019** **No. of Credits: 2**

**Objectives :**

- To Understand fundamentals of object – oriented programming in Java, including defining classes,invoking methods,using class libraries,etc.
- To be able to use the Java SDK enviroment to create, debug and run simple Java programs.
- To understand the Java Programming concepts so as to enable the students of Applications and Applets using Java

**UNIT I**

Introduction to Object-Oriented Programming : Fundamentals – Object oriented Paradigm – Elements of the OOP – Abstraction – Encapsulation – Modularity – Hierarchy –Concurrency Persistance – Inheritance – Polymorphism – Benefits of OOP – Applications of OOP.

**UNIT II**

Java Evolution : History – Features – Difference between Java,C,C++ - Java and Internet – Java and WWW – Web Browsers . Overview : Simple Java Program - Structure – Java Tokens- Statements -JVM - Constants – Variables – Data types – Operators and Expresions.

**UNIT III**

Decision Making and Branching :if,if...else, nested if, switch – Decesion making and looping : while,do,for – Jumps in Loops – Labeled loops – Classes, Objects and Methods. Arrays, Strings and vectors - Interfaces :Multiple Inheritance – Packages : Putting classes together – Multithreaded programming – Thread exceptions – Life cycle of Thread - Thread priority – Synchronization.

**UNIT IV**

Managing Errors and Exceptions – Types of Errors – Exceptions – Applet Programming – Applet life cycle – Graphics Programming.

**UNIT V**

Managing Input / Output Files in Java: Concepts of Streams – Stream classes – Byte stream classes – Character stream classes - Using streams – I/O classes – File classes - I/O Exceptions – Creation of files – Reading / Writing characters, Byte - Handling Primitive data types – Random Access Files

**Text Books:**

1. Grady Booch: “Object Oriented Analysis & Design with Applications”, Second Edition, Pearson Education.
2. E.BalaGurusamy: “Programming with Java”, Third edition, Tata McGraw Hill Pvt Ltd.

**Reference Books:**

1. Patrick Naughton & Hebert Schildt: “The Complete Reference Java 2”, Third edition, Tata McGraw Hill Pvt Ltd.
2. Programming with Java – John R.Hubbard, Second Edition, Tata McGraw

## Programming in C

**Subject Code: 2018ECC020** **No. of Credits: 2**

**Objectives:** To enable the students
To know about problem solving techniques and algorithm fundamentals.
To know about the basics of C Programming and its various computation logics.

**UNIT I**

Overview of C - Introduction – Structure of C - Character set - C tokens - Keyword & Identifiers - Constants - Variables - Data types - Declaration of variables - Assigning values to variables - Defining Symbolic Constants - Operators – Arithmetic Expressions: - Evaluation of expression - Type conversion in expression - operator precedence .

**UNIT II**

Decision Making and Branching - Decision making with IF statement - simple IF statement - The IF ELSE Statement - Nesting of IF ...ELSE statements - The ELSE IF ladder - The switch statement – The GOTO statement -- Decision Making and Looping - The WHILE statement - The DO statement - The FOR statement – Jumps in Loop.

**UNIT III**

Arrays - One Dimensional - Two Dimensional - Multidimensional arrays - Character string Handling - Declaring and initializing string variables - String:Introduction- Standard Functions. Funtions: User - defined Functions - Need for user Defined functions - Types of Functions :No Arguments and no return values - Arguments with return values - Recursion.

**UNIT IV**

Structure : Structure definition - Giving values to members – Structure initialization - comparison of structure variables - Structures within structures- size of structures.

**UNIT V**

Pointers to structures. Pointers – Introduction-Features of Pointers - Declaring and initializing pointers - Accessing a variable through its pointers - pointers and arrays - pointers and character strings

**Text Books:**

1. E. Balagurusamy: **"**Programming in ANSI C" **,** Tata Mc. Graw Hill, 5thEdition (reprint), 2011. (Unit II, Unit III, Unit IV, Unit V)
2. R.G.Dromey: "How to Solve it by Computer", Prentice Hall of India, Delhi,2000 (Unit-I)

**Reference Books:**

1. Byron Gottfried: "Programming with C"(Schaum's Outline Series), Tata Mc.Graw Hill,2nd Edition,1998.
2. Ashok. N. Kamathane: "Programming with ANSI and Turbo C", Pearson Education Asia,4th Edition,2002 .
3. Yeswanth Kanethkar: "Let us C" Tata Mc. Graw Hill, 3rd Edition,1992.

## INTERNET OF THINGS

**Subject Code: 2018ECC021** **No. of Credits: 2**

**Objectives:**

- To get the vision and introduction to IoT .
- To Understand IoT Market perspective, Data and Knowledge Management and use of Devices in IoT Technology.
- To understand state of the art IoT architecture,real world IoT deisgn constraints,industrial automation and commercial building automation in IoT.

**UNIT I**

Introduction- Concepts behind the Internet of Things- The IoT Paradigm- Smart Objects- Creative Thinking Techniques – Modifications- Combination Scenarios- Breaking Assumptions- Solving Problems.

**UNIT II**

M2M to IoT – A Market Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies.

**UNIT III**

M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management Introduction, Technical Design constraints-hardware is popular again.

**UNIT IV**

Introduction, State of the art, Architecture Reference Model- Introduction, Reference Model and architecture, IoT reference ModelIoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. Real-World Design Constraints.

**UNIT V**

Service-oriented architecture-based device integration, SOCRADES: realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things, Commercial Building Automation- Introduction, Case study: phase one-commercial building automation today.

**Text Book:**

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle: “From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”**,** First Edition, Academic Press, 2014.

**Reference Books:**

1. Vijay Madisetti and Arshdeep Bahga: “Internet of Things (A Hands-on-Approach)”, First Edition, VPT, 2014.
2. Francis daCosta: “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”**,** First Edition, Apress Publications, 2013**.**
**3.**Hakima chaouchi,”The Internet Of Things Connecting Objects,2010.

## WEB TECHNOLOGY AND ITS APPLICATIONS

**Subject Code: 2018ECC022** **No. of Credits: 2**

**Objectives:** To enable the students

- To learn about the basic concepts of various networking model and its layers.
- To learn about the concepts of protocol and its architecture.
- To learn about the Java Scripts and XML.

**UNIT I**

Networking Protocols and OSI Model: OSI Model, Layer functions. Internetworking concepts, devices, internet basics: why internetworking, problems, virtual network, repeaters, bridges, routers, gateways, history of internet, growth.

**UNIT II**

TCP/IP Part I: basics, addressing, IP addressing, logical addresses, concept of IP address, ARP, RARP, BOOTP, DHCP, ICMP. TCP / IP Part II: TCP, UDP – basics, features, relationship, ports and sockets, connections, TCP segment format, UDP, differences.

**UNIT III**

DNS, Email, FTP, TFTP – DNS, Email, FTP, TFTP. TCP / IP Part IV : WWW, HTTP, TELNET – history, basics, HTML, common gateway interface, remote login (TELNET).

**UNIT IV**

Java Script and AJAX. PHP / MySQL – scripting language, client side vs Server side, Features of PHP, reference, MySQL basics, using MySQL with PHP.ASP.NET: overview of .NET framework, Details, Server controls and web controls, validation controls.

**UNIT V**

Java Web Technologies – Java servlets and JSP, Creating and testing, servlet, session management, introduction to JSP, JSP and JDBC, EJB, architecture, overview, types of EJB, session beans. Web Security: principles, cryptography, plain text and cipher text, digital certificates, signatures, secure socket layer. XML – what is XML? XML versus HTML, EDI, Terminology, Document-Type Declaration, Element-Type declarations.

**Text Book:**

1. Achyut Godbole and Atul Kahate :"Web Technologies – TCP / IP, Web / Java Programming and Cloud Computing", Third Edition, McGraw Hill Education India Private Limited.

**Reference Books:**

1. Behrouz A. Forouzan : "TCP / IP – Protocol Suite", McGraw Higher Education, Sixth Edition.
2. Paul Deitel, Harvey Dietel and Abbey Dietel: "Internet & World Wide Web – How to Program", Fifth Edition, Tata McGraw Hill.

## NETWORK SECURITY

**Subject Code: 2018ECC023** **No. of Credits: 2**

**Objectives:**To enable the students

- To know about cryptography and its various functions.
- To understand the concepts of hashes and public key algorithm.
- To have a knowledge on different types of authentication.
- To know about the standards, IP security and their applications**.**

**UNIT I**

Cryptography - Introduction – Primer on Networking –Active and Passive Attacks –Layers and Cryptography – authorization Viruses, worms, Trojan Horses – The Multi level Model of Security. Cryptography – Breaking an Encryption Scheme – Types of Cryptographic functions – secret key Cryptography – Public key Cryptography – Hash algorithms.

**UNIT II**

Secret Key Cryptography - Secret Key Cryptography – Generic Block Encryption – Data Encryption Standard – International Data Encryption Algorithm (IDEA) – Advanced Encryption Standard.

**UNIT III**

Hashes and Public Key Algorithms - Hashes and Message Digests: Introduction – Things to do with hash – MD2 – MD4 – MD5. Public Key Algorithms: Modular arithmetic – RSA – Diffie-Hellman – Digital Signature Standard – Elliptic Curve Cryptography.

**UNIT IV**

Authentication - Overview of Authentication Systems: Password-Based Authentication – Address-Based Authentication – Cryptographic Authentication Protocols –Eavesdropping and Server Database Reading – Trusted Intermediaries – Session Key Establishment.

**UNIT V**

Standards, IP Security and Applications - Standards: Kerberos V4: Introduction – Tickets and Ticket-Granting Tickets – Configuration – Logging into the Network – Replicated KDCs. IP Security: Overview of IPSec – IP and IPv6 – Authentication Header – ESP.

**Reference Books:**

1.Charlie Kaufman, Radia Perlman and MikeSpeciner : “Network Security Private Communication in a Public World”, Pearson Education, New Delhi, 2nd Edition,2008 .

2.Stallings William : “Cryptography and Network Security Principles and Practices”, Prentice Hall India, New Delhi, 4th Edition 2007.

3.Stallings William : “ Network Security Essentials Applications and Standards “ Prentice Hall India, New Delhi, 2004.

4.Atul Kahate : “Cryptography and Network Security “ Tata Mc.Graw Hill , 2nd Edition, 2008.

## MOBILE AND WIRELESS TECHNOLOGY

**Subject Code: 2018ECC024** **No. of Credits: 2**

**Objectives:**

To learn the wireless communication on digital mobile communication system and integration of services and applications from fixed networks into networks supporting mobility of end user and wireless access.

**UNIT - I**

Introduction: Applications – A Simplified Reference Mode. Wireless Transmission: Cellular System. Medium Access Control : Motivation for a Specialized MAC : Hidden and exposed terminals – Near and far terminals – SDMA – FDMA – TDMA : Fixed TDM –Classical Aloha – Slotted Aloha – Carrier Sense Multiple Access – Demand assigned Multiple Access – PRMA Packet Reservation Multiple Access – Reservation TDMA – Multiple Access With Collision Avoidance – Polling – Inhibit Sense Multiple Access. CDMA: Spread Aloha multiple access.

**UNIT -II**

Telecommunication Systems: GSM: Mobile Services – System Architecture – Radio Interface – Protocols - Localization And Calling – Handover – Security – New Data Services. DECT: System Architecture – Protocol Architecture – TETRA.

**UNIT -III**

UMTS and IMT 2000: UMTS Releases and Standardization – UMTS System Architecture -UMTS Radio Interface – UTRAN – Core Network – Handover. Satellite System: History – Applications – Basics: GEO – LEO – MEO . Routing – Localization – Handover.Broadcast Systems: Overview – Cyclical Repetition Of Data – Digital Audio Broadcasting –Digital Video Broadcasting – Convergence of Broadcasting and Mobile Communication.

**UNIT -IV**

Wireless LAN: Infra Red Vs Radio Transmission – Infrastructure and Ad-Hoc Network – IEEE 802.11: System Architecture – Protocol Architecture – Physical Layer – MediumAccess Control Layer – MAC Management – HIPERLAN: HIPERLAN1 -WATM – BRAN– HiperLAN2. Bluetooth: User scenarios – Architecture – Radio layer – Base band layer –Link manager protocol

**UNIT -V**

Mobile Network Layer: Mobile IP – Dynamic Host Configuration Protocol – Mobile Ad-Hoc Networks. Mobile Transport Layer: Traditional TCP-Classical TCP Improvement-TCP Over 2.5/3G Wireless Networks – Performance Enhancing Proxies.

**TEXT BOOKS:**

1. Asoke K Talukder and Roopa R Yavagal ,Mobile Computing,Tata McGraw-Hill,,Eleventh Reprint 2009.

2.John Schiller , Mobile communication, Pearson Edition ,2 nd Edition.

**REFERENCE BOOKS:**

1. William C.Y.Lee, Mobile Communication Design Fundamentals ,John Wiley,1993
2. Ivan Stojmenoric , Wireless network & Mobile communication,1st Editio

## CLOUD COMPUTING

**Subject Code: 2018ECC025** **No. of Credits: 2**

**Objectives:**

To Understand the Cloud computing architectures, applications and challenges and learn about various cloud storages

**UNIT - I** **(12 Hours)**

INTRODUCTION: Cloud Computing Introduction, From, Collaboration to cloud, Working of cloud computing, pros and cons, benefits, developing cloud computing services, Cloud service development, discovering cloud services.

**UNIT -II** **(12 Hours)**

CLOUD COMPUTING FOR EVERYONE: Centralizing email communications, cloud computing for community, collaborating on schedules, collaborating on group projects and events, cloud computing for corporation, mapping schedulesm managing projects, presenting on road.

**UNIT -III** **(12 Hours)**

USING CLOUD SERVICES: Collaborating on calendars, Schedules and task management, exploring on line scheduling and planning, collaborating on event management, collaborating on contact management, collaborating on project management, collaborating on word processing, spreadsheets, and databases.

**UNIT -IV** **(12 Hours)**

OUTSIDE THE CLOUD **:** Evaluating web mail services, Evaluating instant messaging, Evaluating web conference tools, creating groups on social networks, Evaluating on line groupware, collaborating via blogs and wikis

**UNIT -V** **(12 Hours)**

STORING AND SHARING: Understanding cloud storage, evaluating on line file storage, exploring on line book marking services, exploring on line photo editing applications, exploring photo sharing communities, controlling it with web based desktops.

**TEXT BOOKS:**

1. Michael Miller, Cloud Computing, Pearson Education, New Delhi,2009.

2.Anthony T. Velte, Cloud Computing A Practical Approach, Tata Mcgraw HillEducation Private Limited,1st Edition2009

**REFERENCE BOOKS:**

1. Arshdeep Bahga, Cloud Computing: A Hands-On Approach, Paperback-Import,,Dec 2013..

## CROSS CULTURE MANAGEMENT

**Subject Code: 2018ECC026** **No. of Credits: 2**

**Objective**:

To provide a thorough understanding

The impact of an international context on management practices based on culture.

Frameworks for guiding cultural and managerial practice in international business.

**UNIT-I**

Basic framework of Cross Cultural Management: Factors influencing Decision Making – Using Culture – Cross Cultural and International Management – Implications for the Manager. Comparing Cultures. Shifts in the Culture – Organizational Culture – Culture and Communication –Needs and Incentives – Dispute Resolution and Negotiation.

**UNIT-II**

Structure of Cross Cultural Management: Formal Structures – Functions – Bureaucracy – Culture and Bureaucracy – Implications. Informal Systems – Informal Relationships – Patronage, Society and Culture –Government-Business Patronage – Guanxi – Managing Informal Systems –Implications.

**UNIT-III**

Globalization & Cross Cultural Management: Planning Change: Meaning – Planning for Change – Planning in Different Culture – Planning in an Unstable Environment – Implications. International Strategies –Globalization and Localization – Defining Globalization – Roots – Global-Local Contradictions – Implications.

**UNIT-IV**

Models of Cross Cultural Management: Family Companies: The Anglo Model: Environment, Culture and Management. The Chinese Model: Environment and Culture. The Chinese Model: Management. Changes in the Chinese model – Implications.

**UNIT-V**

Strategy of Cross Cultural Management: Designing and Implementing Strategy: Formal Strategy Planning – Analyzing Resources and the Competition – Positioning the Company – Implementation – Emergent Strategy – Implications. Head Quarters and Subsidiary: Risk for the Multinational – Control – Implications.

**TEXT BOOK:**

Jean-Francois Chanlat, Cross Culture Management, T&F publication, Edition-2013.

**REFERENCE BOOKS:**

1. Neal Mark, The Culture Factor: Cross-national Management and Foreign Venture, Macmillan, Edition-1998.
2. Prashant Faldu, Cross Culture Management, Presence Institute of Image Consulting Pvt.Ltd., Edition-2015.
3.Dipak Kumar, Cross Culture Management: Text and Case, PHI Publication, Edition-2010.
4.Richard R.Gesteland, Cross-Culture Business Behaviour, Copenhagen Business School Press, Edition-1999.

## INDIAN ECONOMY AND TRADE DEPENDENCIES

**Subject Code: 2018ECC027** **No. of Credit :2**

**Objectives:** On successful completion of the course, the students should have understood
The diversity of issues prevalent in the Indian Economy.
Trade related issues of the Indian Economy.
The importance of trade in the present globalized era.

**UNIT- I**

Introduction to Indian Economy : Alternative Development Strategies – Trends in National Income, Growth and Structure since 1991 - New Industrial Policy 1991 – Recent changes in Trade Policy - Competition Policy - Public Sector Reform - Privatization and Disinvestments – Progress of Human Development in India.

**UNIT-II**

Planning and Economic Development : Redefining the Role of the State –Human Capital Formation in India – Problem of Foreign Aid – Economic Reforms and Reduction of Poverty – Measures to Remove Regional Disparities.

**UNIT-III**

Indian Industries : Review of Industrial Growth under $10^{th}$ and $11^{th}$ Five year plan - Growth and present state of IT industry in India – Outsourcing, Nationalism and Globalization – Small Sector Industrial Policy.

**UNIT-IV**

Foreign Trade: Trends of Exports and Imports of India – Composition of India's Foreign Trade - Direction of India's Foreign Trade – Growth and Structure of India's Foreign Trade since 1991 – Balance of Payments since the New Economic Reforms of 1991. Foreign Capital : Need for Foreign Capital – Foreign Investment Inflows –Role of Special Economic Zones (SEZ)

**UNIT-V**

India in the Global Setting : India in Global Trade – Liberalization and Integration with the Global Economy – Globalization Strategies – India's Foreign Exchange Reserves –Convertibility of the Rupee – WTO and India.

**TEXT BOOK:**

1.Ramesh Singh, Indian Economy, Mcgraw Hill Education, Edition-7, 2015.

**REFERENCE BOOKS:**

1.P.Arunachalam-Indian Economy and Trade, Serial Publication, Edition-1,2011.
2.Sankarganesh,Indian Economy Key concepts, Kavin Mukhil Publications, Edition-4,2016
3.Gaurav Kumar, Indian Economy, Kd Publication, Edition-1, 2016.
4.Puri Misra, Indian Economy, Himalaya Publication, Edition-26, 2008.

## EXPORT MARKETING

**Subject Code: 2018ECC028** **No. of Credits: 2**

**Objectives:**

To gain knowledge on Export distribution channels.
To enable the students to understand Export and Import Procedures.
To create awareness regarding the export promotion and export finance.

**UNIT I**

Export marketing – an overview -export marketing – meaning difference between export marketing and domestic marketing – basic function of export marketing.

**UNIT II**

Export distribution channels – direct export – indirect export – channel; small manufacturer.

**UNIT III**

Export promotion – characteristics of foreign buyers – forms of export promotion-importance of Promotional Activities.

**UNIT IV**

Export and Import Procedure Documents used in Foreign Trade.

**UNIT V**

Export Finanace- Needs- Short terms, Medium and long term Source of Finance types of Credit.

**Text Book**

1.Rathor. BS-Export Marketing - Himalaya publishing House 2006

## INTERNATIONAL TRADE & FOREX

**Subject Code: 2018ECC029** **No. of Credits:**

**Objectives:**

To learn the overview of International Trade and Globalisation.
To make the students to understand the concepts of foreign exchange management.
To gain the knowledge on the basic regulation of FEMA.

**UNIT I**

International trade- Meaning- Scope- Challanges- Theories of International Trade- Balance of Payment- Trade Barriers

**UNIT II**

Competition Law and International Trade- Competition and Consumer Protection- Regulation of anti competition activity

**UNIT III**

Export Policy and Procedure- features- Export Promation Schemes- SEZs , EOU- Deemed Export- Export Promotion Council

**UNIT IV**

Import Policy and Procedure- Import of Gifts- Import on Import basis- Procedure for customer clearance- Warehousing- Canalised import

**UNIT V**

Introduction to FEMA- Forex Management-Nature- Forex Manager- Foreign Exchanfge Market- Foreign Exchange Rate- Types- Present status of Foreign exchange Market in India

**Text Books:**

1. Francis cherunilam -International trade-Himalaya publication House 2010

## BRAND MANAGEMENT

**Sub Code: 2018ECC030** **No. of Credits: 2**

**Objective:**

To understand the methods of managing brands and strategies for brand management.
To successfully establish and sustain brands and lead to extensions

**UNIT I**

Basics Understanding of Brands – Definitions - Branding Concepts – Functions of Brand - Significance of Brands – Different Types of Brands – Co branding – Store brands.

**UNIT II**

Strategic Brand Management process – Building a strong brand – Brand positioning – Establishing Brand values – Brand vision – Brand Elements – Branding for Global Markets – Competing with foreign brands.

**UNIT III**

Brand image Building – Brand Loyalty programmes – Brand Promotion Methods – Role of Brand ambassadors, celebrities – On line Brand Promotions.

**UNIT IV**

Brand Adoption Practices – Different type of brand extension – Factors influencing Decision for extension – Re-branding and re-launching.

**UNIT V**

Measuring Brand Performance – Brand Equity Management - Global Branding strategies - Brand Audit – Brand Equity Measurement – Brand Leverage -Role of Brand Managers– Branding challenges & opportunities.

**TEXT BOOK:**

1.Keller/ Parameswaran & Jacob, Strategic Brand Management: Building, Measuring, and
2.Managing Brand Equity, Pearson Education India; 4 Edition 2015.

**REFERENCE BOOKS:**

1.Y.L.R. Moorthi, Brand Management, Vikas Publishing House, 1st Edition 2003.
2.Sagar Mahim, D. P. Agrawal, Brand Management, ANE Books Edition 2009.
3.Kirti Dutta, Brand Management: Principles and Practices, Oxford University Press, Edition 2012.
4.Ranjeet Verma, Brand Management, Laxmi Publications, 1st Edition 2009.

## STRESS MANAGEMENT

**Subject Code: 2018ECC031** **No. of Credits: 2**

**Objectives:**

To provide a broad physical, social and psychological understanding of stress.

To understand the management of work related stress

To develop and implement effective strategies to prevent and manage stress at work.

**UNIT I**

Meaning – Symptoms – Works Related Stress – Individual Stress – Reducing Stress – Burnout.

**UNIT II**

Time Management – Techniques – Importance of planning the day – Time management schedule – Developing concentration – Organizing the Work Area – Prioritizing – Beginning at the start – Techniques for conquering procrastination – Sensible delegation – Taking the right breaks – Learning to say 'No'.

**UNIT III**

Implications – People issues – Environmental issues –Psychological fall outs – Learning to keep calm – Preventing interruptions – Controlling crisis – Importance of good communication – Taking advantage of crisis – Pushing new ideas – Empowerment.

**UNIT IV**

Developing a sense of Humour – Learning to laugh – Role of group cohesion and team spirit – Using humour at work – Reducing conflicts with humour.

**UNIT V**

Improving Personality – Leading with Integrity – Enhancing Creativity – Effective decision Making – Sensible Communication – The Listening Game – Managing Self – Meditation for peace – Yoga for Life.

**Text Book:**

1.D M Pestonjee, Stress and Work: "Perspectives on Understanding and Managing Stress", SAGE Response, First Edition 2013.

**Reference Books:**

1.Kamlesh Jani, Ratish Kakkad, Stress Management, Pothi Publishers, Edition 2008.

2.Aarti Gurav , Time Management , Buzzing stock Publishing House, First Edition 2014.

3.Sanjay Kumar, Pushp Lata, Communication Skills, Oxford University Press, Second Edition 2015.

4. Barun Mitra, Personality Development and Soft Skills, Oxford University Press, Second Edition 2017.

## RISK AND INSURANCE IN INTERNATIONAL TRADE

**Subject Code: 2018ECC032** **No. of Credit :2**

**Objective:** On successful completion of this course, the students should have understood basic principles of insurance and risk management

Understanding contemporary issues related to insurance

**UNIT-I**

Nature and History of Insurance Business - Insurance Business in India Europe, UK and USA - insurance Act 1938 -General insurance business -Nationalisation - Insurance as a social security tool – Insurance and economic development - IRDA- Entry of private players into Insurance business -Actuarial profession -Global Trends and developments in Insurance Business

**UNIT-II**

Principles of Legal aspects of Insurance - Principles of Insurable Interest – Principles of Utmost Good Faith – Principles of Indemnity - Principles of Subrogation -Doctrine of Proximate Clause - Tariff Advisory Committee – Legal Aspects of Life Assurance - Global Insurance Regulatiory Frame work.

**UNIT-III**

Global Non-life Insurance: Principles & Practices Fire insurance – Standard fire policy; Marine - Cargo and Hull insurance – Types; Motor insurance – Liability insurance, Types of policies; Engineering insurance – Electronic equipment insurance, Burglary insurance – Underwriting Practices – Claims settlement in International Perspectives.

**UNIT-IV**

Risk management process – Risk identifications: perception of risk, Threat analysis, Even analysis, Safety Audit – Risk evaluation – Concept of probability –Statistical methods of risk evaluation – Value at Risk (VaR)

**UNIT-V**

Risk Management Methods – Contingency Planning – Risk Transfer – Captive Insurance agreements – Reinsurance – Catastrophe covers – Legal Aspects of Reinsurance – Reinsurance Markets – Lloyds Markets – Risk Management techniques for global insurance market players.

**TEXT BOOK:**

1.Mishra, M.N,Insurance principles and practices, S. Chand and Co, Delhi, Edition 4, 2007 .

**REFERENCE BOOKS:**

1.Tripathy N.P,Insurance principles and practices,Prentice Hall India Learning Private Limited Edition 3, 2009

2.Ghanashyam Panda & Monika Mahajan,Principles and Practice of Insurance,Kalyani Publishers Edition 4, 2011.

3.Insurance Regulatory and Development Authority Act, 1999 ,Universal Law Publishing - An imprint of LexisNexis Edition 1, 2016.

4.S K Sarvaria,Commentary on the Insurance Regulatory and Development ,Universal Law Publishing - An Imprint of Lexis Nexis; Edition 1, 2016

## RETAIL MARKETING

**Subject Code: 2018ECC033** **No.of Credits: 2**

**Objective:**

To enable the students to understand about Global Retailing.
To provide knowledge on Visual Merchandise Management.
To familiarise the students with the Retail shoppers' behaviour**.**

**UNIT I**

An overview of Global Retailing – Challenges and opportunities – Retail trends in India – Socio economic and technological Influences on retail management – Government of India policy implications on retails.

**UNIT II**

Organized and unorganized formats – Different organized retail formats – Characteristics of each format – Emerging trends in retail formats – MNC's role in organized retail formats.

**UNIT III**

Choice of retail locations - internal and external atmospherics – Positioning of retail shops – Building retail store Image - Retail service quality management – Retail Supply Chain Management – Retail Pricing Decisions. Merchandising and category management – buying.

**UNIT IV**

Visual Merchandise Management – Space Management – Retail Inventory Management – Retail accounting and audits - Retail store brands – Retail advertising and promotions – Retail Management Information Systems - Online retail – Emerging trends .

**UNIT V**

Understanding of Retail shopper behavior – Shopper Profile Analysis – Shopping Decision Process - Factors influencing retail shopper behavior – Complaints Management - Retail sales force Management – Challenges in Retailing in India.

**TEXT BOOK:**

1**.** A.Sivakumar, Retail Marketing, Excel Books, Edition-1, 2007.

2.David Gilbert, Retail Marketing Management, Pearsons Education, Edition-2006.

**REFERENCE BOOKS:**

1**.** Dr.L.Natarajan, Retail Marketing, Margham Publications, Edition-1,2013.

2.S.Banumathi, Retail Marketing, Himalaya Publishing House, Edition-2015.

3.B.B.Mishra, Retail Marketing, Vrinda Publication, Edition-2010

## EXPORT AND IMPORT PROCEDURES

**Subject Code: 2018ECC034** **No.of Credits: 2**

**Objective:**

To enable the students to understand about export and import procedures
To provide adequate knowledge on export and import documentation.
To impact knowledge on export and import procedures.

**UNIT I**

Introduction to Export Management : Meaning – objectives – scope – Need for and importance of export trade – Distinction between internal trade and international trade – Problems faced by exporters.

**UNIT II**

Features and Functions of export marketing – Sources of market information – Product planning – Quality control – Export pricing – Export marketing channels – Strategy formulation.

**UNIT III**

Steps involved in export – Confirmation of order – Production of goods – Shipment – Negotiation – Documents used for export – Commercial documents
– Regulatory documents – ISO Certificate.

**UNIT IV**

Import Trade law in India – Preliminaries for star ting Import Business – Registration of Importers – arranging finance for Import – Arranging letter of Credit for Imports – Balance of Payments – Liberalization of Imports.

**UNIT V**

Retirement of Import Documents and RBI's directives for making payment for Imports – Customs clearance of Imported Goods and payments of customs Duty – Imports under special schemes.

**Text Books:**

1.Subramanian Balagopal.T.A.S", Export Marketing",Himalaya Publication House,Mumbai,Edition 1,2010.
2.Francis Cherunilam,"International Trade & Export Management",Himalaya Publication House,Mumbai,Edition 1,2012.

**References Books :**

1.Veera Reddy.P,"Import made Easy",Commercial Law Publication,New Delhi",Edition 5,2001.
2.Mahajan.M.I,"Export Policy Procedure & Documentation",Snow White Publication,Mumbai,Edition 24,2011.
3.A Nabhi : "How to Import 2005-2006",A Nabhi Publications, 1st Edition 2006.

## LOGISTICS AND SUPPLYCHAIN MANAGEMENT

**Sub Code : 2018ECC035** **No. of Credits: 2**

**Objective:** The objective of the subject is to explore
The interlinking between Logistics and supply chain management.
The course seeks to provide the key concepts and solution in the design, operation, control and management of supply chain as integrated systems.
The impact of supply chain in gaining competitive advantage.

**UNIT I**

Introduction to logistics – Business logistics – marketing logistics – objectives –importance – logistics and customer services – physical supply and distribution –elements and evolution of purchasing and integrated logistics – Integrated logistical activities – strategic integrated logistics management.

**UNIT II**

Transportation – types – transportation decision making service selection – sea transport, Air, Courier, road and pipe lines – infrastructure – vehicle routing and scheduling – MTO / Intermodal transportation – regulation.

**UNIT III**

Warehousing – concepts & development – types – operations location analysis –storage – need – functionality and principles – materials handling considerations – packaging – perspectives – purposes – functions – design and costs –Traffic inventory management models – pull and push methods – EOQ – assumptions –policies and control – methods of improved inventory management.

**UNIT IV**

Logistics information system – system design – Information functionality and principles of information architecture – application of new information technology – EDI standards.

**UNIT V**

Future management of logistics – logistics and outsourcing – Benefits – third party logistics – value added services – reverse logistics.

**TEXT BOOK:**

1.Donald J. Bowersox & David J. Closs, Supply Chain Logistics Management, McGraw Hill Education , 3rd Edition 2016.

**REFERENCE BOOKS**:

1.Raghuram, Logistics And Supply Chain Management: Cases and Concepts, Laxmi Publications, Edition 2015.
2.Janat Shah, Supply Chain Management, Pearson Education, 1st Edition 2009
3.Ballou, Business Logistics/Supply Chain Management, Pearson Education India, 5th Edition 2007.
4. Chopra & Kalra, Supply Chain Management, Pearson Education India; 6th Edition 2016.

## QUALITY MANAGEMENT

**Sub Code : 2018ECC036** **No. of Credits: 2**

**Objective:** On successful completion of the course the students should have understood

To introduce the fundamental concepts of total quality management, statistical process control, six sigma and the application of these concepts

To provide a basic understanding of "widely-used" quality analysis tools and techniques.

**UNIT I**

Definitions – TOM framework, benefits, awareness and obstacles. Quality – vision, mission and policy statements. Customer Focus – customer perception of quality, Translating needs into requirements, customer retention. Dimensions of product and service quality. Cost of quality.

**UNIT II**

Overview of the contributions of Deming, Juran Crosby, Masaaki Imai, Feigenbaum, Ishikawa, Taguchi techniques – introduction, loss function, parameter and tolerance design, signal to noise ratio. Concepts of Quality circle, Japanese 5S principles and 8D methodology.

**UNIT III**

Meaning and significance of statistical process control (SPC) – construction of control charts for variables and attributed. Process capability – meaning, significance and measurement – Six sigma concepts of process capability. Reliability concepts – definitions, reliability in series and parallel, product life characteristics curve. Total productive maintenance (TMP) – relevance to TQM, Terotechnology. Business process re-engineering (BPR) – principles, applications, reengineering process, benefits and limitations.

**UNIT IV**

Quality functions development (QFD) – Benefits, Voice of customer, information organization, House of quality (HOQ), building a HOQ, QFD process. Failure mode effect analysis (FMEA) – requirements of reliability, failure rate, FMEA stages, design, process and documentation. Seven old (statistical) tools. Seven new management tools. Bench marking and POKA YOKE.

**UNIT V**

Introduction to IS/ISO 9004:2000 – quality management systems – guidelines for performance improvements. Quality Audits. TQM culture, Leadership – quality council, employee involvement, motivation, empowerment, recognition and reward.

**TEXT BOOK:**

1.R. Janakiraman and R,K Gopal, Total Quality Management, PHI Learning, 1st Edition 2009.

**REFERENCE BOOKS**:

1. Howard S.Taylor and Francis, Quality Management Systems, New century Publications, Edition 2000
2. L.Suganthi Anand Samuel, Total Quality Management,PHI learing, 1st Edition 2009,
3.Joseph M.Juran, Quality Handbook, Mc Grawhill,6th Edition .
4.Bell Desmond Heivemann, Managing Quality,Butterworth Publications, Edition 1994.

## MANAGEMENT OF SMALL AND NEW ENTERPRISES

**Sub Code : 2018ECC037** **No. of Credits: 2**

**Objective:** On successful completion of the course the students should have understood
Identification, organization and building of new enterprise
To prepare, analyze and execute business plan
The logical decision making in business

**UNIT I**

Entrepreneurship: Small Scale Introduction Institutional- Small scale Enterprises – Infrastructure-Entrepreneurial Competencies for Small Scale Enterprises -Institutional Interface

**UNIT II**

Establishing small scale enterprises -opportunities scanning—choice of enterprise - market assessment for sse - choice of technology and selection of site

**UNIT III**

Small scale enterprises — getting organized- financing the new/small enterprise - preparation of the business plan - ownership structure and organization framework

**UNIT IV**

Operating the small scale enterprise - financial management issues in SSE -operations management issues in SSE- Marketing management issues in SSE - organizational relations in SSE

**UNIT V**

Performance appraisal and growth strategies - management performance lessons growth and Assessment and control from stabilization - strategies for stabilization and successful strategies Growth entrepreneurs of small - managing family enterprises

**TEXT BOOK:**

1.Prof.Nirali Pandt, Management of new and small Enterprise, Dotcom Publications, 5th Edition,2016.

**REFERENCE BOOKS:**

1.C.S.Prasad, Small and Mdium Enterprise in global Perspective, New Century Publications, I Edition, 2009
2.Taxmann, Small and Medium Enterprises in India, Tax mann Publication, Edition 2013.
3.Karen Patten Ayman, Information Technology for small business, Sprnger publications, Edition 2012.
4.Sarika Lohana, Medium,Micro and Small Enterprises, New century Publications, 1st Edition 2014.

## TOURISM MANAGEMENT

**Sub Code : 2018ECC038** **No. of Credits: 2**

**Objective:** On successful completion of the course the students should have understood
The handling of human resource in the context of complex work situations of the tourism industry.
The complexities of marketing the tourism product
The challenges and rewards of Tourism industry

**UNIT I**

History of Tourism both International and National, Definition, nature, importance, components and typology of tourism.

**UNIT II**

Concepts of domestic and international tourism, recent trends. Organization of both national and international in world in promotion and development – WTO, IATA, UPTAA, AI, IATO, etc.

**UNIT III**

Growth and development of tourism in India, National Action Plan 1992.

**UNIT IV**

Impacts of tourism-economics, social, physical and environmental, Tourism trends world over and its futuristic study.

**UNIT V**

Emerging trends in tourism—health tourism, adventure tourism, ecotourism .

**TEXT BOOK:**

Rajan chauhan, Tourism Management, APH Publishing Corporation- Edition-2012.

**REFERENCE BOOKS:**

1.David Weaver Laura Lawton, Tourism Management, Jhon Wiley & Sons Inc., Edition-2, 2006.
2. Ratandeep Singh, Tourism and Transport Management, Kanishka Publishiners, Edition-1, 2008.
3.Atul Shrivastava, Tourism Planning & Management, Anmol Publications Pvt., Ltd., Edition-2010.
4. Vandhana Joshi, Achana Biwal, Tourism Operations & `Management, Oxford University Press, Edition-1, 2009.

## EVENT MANAGEMENT

**Sub Code: 2018ECC039** **No. of Credits: 2**

**Objective:** On successful completion of the course the students should have understood
Organization and management of events
The management of accounting and financial aspects in organizing an event
Planning the logistics and coordinating the technical aspects

**UNIT I**

Why Event Management, Requirement of Event Manager, Analyzing the events, Scope of the Event, Decision-makers, Technical Staff, Developing Record-Keeping Systems, Establishing Policies & Procedures

**UNIT II**

Preparing a Planning Schedule, Organizing Tasks, Assigning Responsibility, and Communicating, Using the Schedule Properly, The Budget, Overall Planning tips, Checklists, Expert Resources, Computer Software Required.

**UNIT III**

Who are the people on the Event, Locating People, Clarifying Roles, Developing content Guidelines, Participant Tips, Reference Checks, Requirement Forms, Introduction, Fees & Honorariums, Expense Reimbursement, Travel Arrangements, Worksheets.

**UNIT IV**

Types of Events, Roles & Responsibilities of Event Management in Different Events, Scope of the Work, Approach towards Events

**UNIT V**

Introduction to PR – Concept, Nature, Importance, Steps, Limitations, Objectives Media – Types of Media, Media relations, Media Management PR strategy and planning – identifying right PR strategy, Brain Storming sessions, Event organization, writing for PR

**TEXT BOOK:**

1.Sita Ram Singh , Event Management, Aph Publishing Corporation , Edition 2009.

**REFERENCE BOOKS:**

1.Wagen, Event Management, Pearson, 1st edition 2005.
2.C.P. Harichandan, Event Management, Global Vision Publishing House, 1st edition 2010.
3.Tony Rogers, A Global Industry (Events Management), S.Chand (G/L) & Company Ltd, 3rd Edition 2013.
4. D. G. Conway, The Event Manager's Bible: The Complete Guide to Planning and Organising a Voluntary or Public Event, Viva Books 1st Edition 2010.

## HOSPITALITY MANAGEMENT

**Sub Code: 2018ECC040** **No. of Credits: 2**

**Objective :** On successful completion of the course the students should have understood
To plan and execute hospitality events in coordination with back-of-the-house managers
To Design and evaluate a hospitality operations plan, employing control systems and technologies, with guest preferences
To Supervise and coordinate personnel, demonstrating clear communication and cultural sensitivity

**UNIT I**

The World of Hospitality: Introduction to Hotel, Travel and tourism Industry - Nature of Hospitality: Communication, Turnover, Demands and Rewards - Economic and Other Impacts of Hotel, Tourism, and Travel Industry - Early History of Lodging - Globalization of the Lodging Industry - Franchising

**UNIT II**

The Organization and Structure of Lodging Operations : Size and Scope of the Industry - Classifications of Hotels - Hotel Market Segments - Organization of Hotels - Food Service Industry : Composition and Size of Food Service Industry - Organization of Hotel and Restaurant Food Service - Management and Operation of Food Services

**UNIT III**

The Rooms Division: The Front Office Department - The Reservation Department - The Telecommunications Department - The Uniformed Service Department

**UNIT IV**

Functional areas: Engineering and Maintenance Division - Marketing and Sales Division - Accounting Division - Human Resources Division - Security Division

**UNIT V**

Hospitality Marketing: Distinctive characteristics - Seven Ps of Marketing – Segmentation., Targeting and Positioning - Future trends in Hospitality Industry: Usage of CRS in Hotel Industry, Chain of hotels- Role of Associations in hospitality management

**TEXT BOOK:**

Jhon R.Walker, Introduction to Hospitality Management, Pearson India, Edition-2, 2008.

**REFERENCE BOOKS:**

1.Teason.D, Principles of Management for Hospitality Industry, Routledge, Edition 2009.
2. Dr.Saurabh Dixit, Tourism & Hospitality Management, APH Publishing Corporation, Edition-2013.
3. Gajanan Shirke, Hospitality Management, Shorff Publishers, Edition-2011.
4. Aadesh Sinha, Hospitality Operation Management, Centrum Press, Edition-2012

## CONSUMER BEHAVIOUR

**Sub Code : 2018ECC041** **No. of Credits: 2**

**Objective:** On successful completion of the course the students should have understood
Consumer motivation and perception
Learning and attitude
Consumer decision making

**UNIT-I**

Introduction - Consumer Behaviour — definition - scope of consumer behaviour — Discipline of consumer behaviour — Customer Value Satisfaction — Retention — Marketing ethics.

**UNIT –II**

Consumer research — Paradigms — The process of consumer research - consumer motivation — dynamics — types — measurement of motives — consumer perception

**UNIT – III**

Consumer Learning — Behavioural learning theories — Measures of consumer learning — Consumer attitude — formation — Strategies for attitude change

**UNIT – IV**

Social class Consumer Behaviour — Life style Profiles of consumer classes — Cross Cultural Customers Behaviour Strategies.

**UNIT-V**

Consumer Decision Making — Opinion Leadership — Dynamics — Types of consumer decision making — A Model of Consumer Decision Making

**TEXT BOOK:**

1. Leon G. Schiffman, Joseph Wisenblit, Consumer Behaviour, Pearson publication, 11th Edition, 2015.

**REFERENCE BOOKS:**

1. Sathis K Batra, Shhkazmi, Consumer Behaviour, Excel publication, 2nd Edition, 2008.
2. Suja R.Nair, Consumer Behaviour, Himalaya publication, 1st Edition, 2016.
3. Majumdar, Ramanuj, Consumer Behaviour, Prentice Hall India Learning Pvt Ltd, 7th Edition, 2009.
4. Rajneesh Krishna, Consumer Behaviour, Oxford University Press,1st Edition, 2014.

## HUMAN RESOURCE MANAGEMENT

**Subject Code : 2018ECC042** **No. of Credits: 2**

**Objectives:**

To understand the nature of human resources and its significance to the organization

To familiarise students with the various techniques in HRM that contribute to the overall effectiveness of an organization.

To bring the attention of the students on the latest trends in managing human resources in an organization.

**UNIT I**

Human Resource Management:Definition – Objectives – Functions - Evolution And Growth Of HRM– Qualities Of A Good HR Manager – Changing Roles of a HR Manager-– Problems And Challenges of a HR Manager.

**UNIT II**

Planning The Human Resources :definitions Of Human Resource Planning – Objectives – Steps In Human Resources Planning – Dealing With Surplus And Deficient Man Power - Job Analysis – Job Description – Job Specification.

**UNIT III**

Recruitment & Selection : Recruitment And Selection – Objectives of Recruitment – sources – Internal And External Recruitment – Application Blank – Testing – Interviews.

**UNIT IV**

Training & Development :Training and development – Principles of Training – Assessment Of Training Needs – on the Job Training methods - off the Job Training Methods – Evaluation of Effectiveness of Training Programmes.

**UNIT V**

Performance Appraisal :Performance Appraisal– process – Methods of Performance Appraisal – Appraisal Counseling – Motivation process – Theories of motivation – Managing Grievances and Discipline.

**Text Books:**

1. Tripathi: “Personnel Management”, Sultan Chand & Sons, New Delhi, 2000.
2. L M Prasad: “Human Resource Management”, Sultan Chand & Sons, New Delhi, 2005.

**References Books**:

1. Aswathappa: “Human Resource Management”, Tata Mc Graw Hill Publishing Company, New Delhi, 1999.
2. Davis and Werther: “Human Resource Management”, Tata Mc Graw Hill Publishing Company, New Delhi, 2000 .

## PRINCIPLES AND PRACTICE OF MARKETING SERVICES

**Subject Code: 2018ECC043** **No. of Credits: 2**

**Objectives:**
To enable the students to gain knowledge on marketing of various services.
To enlighten the students'knowledge on marketing services.
To make the students understand about practice of marketing services.

**UNIT I**

Meaning of Services Marketing – Definitions – Its importance – characteristics of services – Growth of Services Marketing – Types of services – Comparative analysis between services and products.

**UNIT II**

Concept of services marketing – Societal concept – Buyer behaviour concept – Factors influencing buyer behaviour – Decision making process of buyer.

**UNIT III**

Services Marketing Mix – Product Strategy – Product Life Cycle concept – Strategic during the P.L.C. – Product Planning Strategy – Development of new products – its simplification – Diversification and elimination.

**UNIT IV**

Services Marketing – I : Bank Marketing – Insurance Marketing – Transport Marketing.

**UNIT V**

Services Marketing – II: Tourism and Hotel Marketing - Education Marketing – Communication Services Marketing.

**Reference Books:**

1. S.M.Jha,: "Services Marketing", Himalaya Publication House, Mumbai, Sixth Edition, 2003.

2. Christopher love lock: "Services Marketing", Person Education Chennai, Sixth Edition, 2010.

3. Philip Kotler: "Marketing Management", Person Education Chennai, Sixth Edition, 2013

4. S.Sherlekar: "Marketing Management", Himalaya Publication House, Mumbai, Sixth Edition, 1997.

## CONSUMER MARKETING

**Subject code: 2018ECC044** **No. of Credits: 2**

**Objectives:**

To make the students to understand the concepts of consumer marketing and the motivation theories.

To understand the customer value chain and their demography.

To understand market segmentation and their uses.

**UNIT I**

Introduction- Definition of Consumer Marketing- Need and importance- Scope- Consumer Needs- Theories of Motivation and their application- Process Theories-– Content theories- Personality and Self Concept- Theries of Personality – Trait Theory

**UNIT II**

Building Customer Value and Satisfaction- Delivering Customer Value- Value Chain – Value Delivery Network- Attracting and Retaining Customer Retention- Relationship Marketing- Customer Demand- Demography- Market Segmentation- Benefits- Criteria for Market Segmentation.

**UNIT III**

Learning Theories and their application- Brand Loyality- Brand Extention- Conditioning Theories- Cognitive Learning Theory- Attitude and Attitribute theory- Cognitive Dissonance- Self Concept- Development of Self- Fashion – Cosmetics- and Conspicious Consumption

**UNIT IV**

Perception- Thershold of perception- Sublinieal of Perception- Perception- Perceptual Process- Dynamics- Positioning Methods- and Measurement- Perceptual Mapping- Multidimensional Scaling- Consumer Imaginaries

**UNIT V**

Advertising- Role in Marketing Process- Legal and Ethical Process- Social Aspects- Function and Types of Advertising- Integrated Marketing Communication- Brand Management- Brand Equity- Image in Brand Equity Buiding- Ethics in Advertisement

**Text Books:**

1. Schiffman L.G and Kanuk L: “Relationship Marketing”, Tata MC Graw Hill, Twelfth Edition 2009.

2. R.S.N Pillai and Bhavathi : “Modern Marketing Principles and Practices”, S.Chand & Co., Ltd., New Delhi, Seventh Edition, 2011.

3.Paul green Berg: “Customer Relationship Management”, Tata MC Graw Hill, Seventh Edition, 2009.

**Reference books:**

1.Philip Kotler and Gray Armstrong: “Principles of Marketing”, Pearson Education Pvt Ltd., Seventh Edition, Reprinted 2011.

2. Dr.Rajan Nair: ”Marketing Management”, Sulthan Chand & Sons, Eleventh Edition, NewDelhi

## MARKETING OF HEALTH SERVICES

**Subject Code:** 2018ECC045 **No. of Credits: 2**

**Objectives:**

To enable the students understand about health services.

To make the students aware of different marketing mix in health industry.

To confer knowledge about online health services .

**UNIT – I**

Marketing plans for services: process, strategy formulation, resource allocation and monitoring services communications- customer focused services- service quality- SERV QUAL model

**UNIT – II**

Hospital services- Selecting Health Care Professionals- Emerging trends in Medicare- Marketing Medicare – Thrust areas for Medicare services.

**UNIT – III**

Marketing Mix for Hospitals- Product Mix- Promotion Mix- Price Mix- Place Mix- Strategic Marketing for Hospitals.

**UNIT – IV**

Online Health Services- Organization of Online Health Care Business- On-line Marketing and On-line financial & clinical transaction.

**UNIT – V**

Legal system: Consumer Rights & Protection, medicine safety rules- Food & Nutrition Security in India - Health Promotion Agencies

Note: Question paper shall cover 100% Theory

**REFERENCE BOOKS:**

1. Richard K. Thomas, Health Services Marketing, A Practitioner's Guide, Edition-2, 2008.

2. Zeithaml, Services Marketing, Mcgraw Hill Education, Edition-6, 2013.

3. Lovelock, Services Marketing, Pearson India, Edition-7, 2011.

4. Er.I.C. N.Berkowitz, Essentials of Health care Marketing , Jones & Bartlett Learning, Edition-3, 2010.

## INTERNATIONAL BANKING

**Subject Code: 2018ECC046** **No. of Credits: 2**

**Objectives:**

The course aims to provide the students with

a sound grasp of the practices of modern international banking

the central themes and issues will be examined in an international and comparative context.

**UNIT-I**

Global trends and development in international banking – Outline of international banking and finance. Wholesale banking – Retail banking – Private banking – Interbank business – Regulatory framework – BASEL-II.

**UNIT-II**

International financial centers – Offshore banking units – Special Economic Zones – Foreign exchange management control – International loan agreements – International debt management.

**UNIT-III**

Asset liability management – Profitability of international banking operations – Investment banking – Correspondent banking – Bank Regulation: Regulation and prudential supervision of banks in the UK and EU. International regulatory and supervisory convergence. Regulating the multifunctional bank.

**UNIT-IV**

International financial institutions – IMF, IBRD, BIS, IFC, ADB, WTO – international competitiveness – implications and effectiveness and country risk.

**UNIT-V**

Treasury and risk management – bank risk management – letters of credit mechanism – buyers and sellers credit – bilateral and counter trade.

**TEXT BOOKS:**

1.Indian Institute of Banking and Finance, International Banking, Macmillan, Edition-2011.

**REFERENCE BOOKS:**

1.Ruonarayan Bose, Fundamentals of International Banking, Laxmi Publications, Edition-2014.
2.Indaian Institute of Banking and Finance, International Banking Operations, Macmillan, Edition-2017.
3.Yoon S. Park, International Banking and Financial Centers, Springer Publications, Edition-2011.
4.Emmanuel N Roussakis, International Banking, Greenwood Press, Edition-1983.

## E-COMMERCE

**Subject Code: 2018ECC047** **No. of Credits: 2**

**Objectives:**

To provide knowledge about Electronic Commerce.

To enable the students understand the technology of e-Commerce for Business Application.

To make the student aware of the Techniques in the Application of e-Commerce.

**UNIT I**

E-commerce – framework – classification of electronic commerce – Anatomy of E-Commerce Applications – components of the I way –network access equipment – internet terminology.

**UNIT II**

Electronic Data Interchange – Benefits – EDI Legal, Security & privacy issues – DEI software implementation – value added networks – internal information systems – work flow atomization and coordination – customization and internal commerce.

**UNIT III**

Network security and firewalls – client server network security – emerging client server security threats – firewalls and network security – data and message security – encrypted documents and electronic mail – hypertext publishing – technology behind the web – security and the web.

**UNIT IV**

Consumer oriented electronic commerce: consumer oriented applications – mercantile process models – mercantile models from the consumer's perspective – mercantile models from the merchant's perspective.

**UNIT V**

Electronic payment systems – types – digital token based electronic payment system – smart cards & credit card electronic payment systems – risk designing electronic payment.

**Text Books:**

1. Ravi Kalakota and Andrew B.Whinston: "Frontiers of Electronic Commerce", Pearson Education, First Edition, 2006.
2. Elias M Awand: "Electronic Commerce", Phi Learning Pvt Ltd, Third Edition, 2007.

**Reference Books:**

1.Daniel Minoli and Emma Minoli: "Web Commerce Technology Handbook", Tata McGraw Hill Publishing, New Delhi, First Edition, 2006.
2. Efrain Turban and David King: "Electronic Commerce", Pearson Education, First Edition 2009.
3. Pete Loshin: "Electronic Commerce", Firewall Media, Fourth Edition, 2005.

## INTERNATIONAL ACCOUNTING

**Subject Code: 2018ECC048** **No. of Credits: 2**

**Objective:** To make the students understand

the concept and nuances of international accounting standards and practices for international business firms

the importance of financial reporting in international environment.

**UNIT-I**

Objective of International Financial Reporting – Concept International Accounting Practices, introduction to inter corporate investments – inter company transaction – Global Joint Venture Accounting, Foreign Currency Translation accounting

**UNIT-II**

Financial instruments – Presentation and disclosure – Convertible securities – recognition and measurement of financial instruments –comprehensive income – settlement Date Vs Trade Date Accounting.

**UNIT-III**

Inter corporate investment – Temporary and Portfolio investments –Business combination and reporting methods – consolidation procedures –Financial statements disclosure.

**UNIT-IV**

Global mergers & acquisitions accounting – consolidating wholly, non wholly owned subsidiary under equity and cost recording – Inter company revenue, expenses & inter company profile profit & expenses.

**UNIT-V**

Financial reporting in an international environment – Integrated Vs Self Sustaining foreign subsidiary – GAAP for public sector organizations.

**TEXT BOOK:**

**1.** A. K. Das Mohapatra,International Accounting,Prentice Hall India Learning Private Limited , Edition 2, 2012.

**REFERENCE BOOKS:**

1. Med ,Accounting and Finance for Bankers,Macmillan Education Edition 3, 2012.
2. Timothy Doupnik,International Accounting,McGraw-Hill Higher Education; Edition 3, 2011
3. Frederick D.S. Choi,International Accounting,Pearson Education; Edition 5, 2007
4. Shirin Rathore ,International Accounting,PHI, Edition 2,2011.

## CORPORATE SOCIAL RESPONSIBILITY AND GOVERNANCE

**Subject Code: 2018ECC049** **No. of Credits: 2**

**Objectives:**

To make the students to understand the concepts of corporate governance

To gain knowledge on legislative framework of corporate governance and Corporate Social Responsibility and good corporate citizenship.

To understand the Business Ethics and Genesis**.**

**UNIT-I:**

Evolution -Concept-Principles and development-Management structure for corporate governance-Board structure-Stake holder's relationship committee-Appraisal of Board performance-Transparency and disclosure.

**UNIT-II:**

Legislative framework of corporate governance:UK,USA,India-Corporate communication-Art and Craft of investors relation-Shareholders activism-Investor protection-changing role of Institutional Investors

**UNIT-III:**

Corporate social responsibility and good corporate citizenship:Various governance forums-Common Wealth Association for Corporate Governance-Organization for Economic Cooperation Development (OECD)-International Corporate Governance Network (ICGN)-National Foundation for Corporate Governance(NFCG)

**UNIT-IV:**

Business Ethics-Business dilemma versus decision-Dilemma resolution process-Business ethics as a strategic management tool-stakeholders protection-corporate leadership

**UNIT-V:**

Genesis-Meaning-Nature-Objectives-Scope of Corporate Sustainability.Legal framework -conventions and treaties on environmental- Health and safety-Social security issues.

**TEXT BOOKS:**

1. Corporate Governance in India : An Evaluation by Das,Subash Chandra.
2. Baxi CV-Corporate Social Responsibility And Governance – Excel books 2006.

## ENTERPRISE RESOURCE PLANNING

**Subject Code: 2018ECC050** **No.of Credits: 2**

**Objectives:**

To enable the students undrstand about the different organizational processes and work flows in ERP.

To bestow knowledge on ERP services and Business Process Re-engineering .

To give knowledge on ERP project and its implementation.

**UNIT 1**

**ERP: Introduction : Define – Functional Module in** ERP System – Evolution of ERP Systems - Characteritics of ERP – Process Intergration With ERP Systems. Benefits of ERP Applications – Technology Behind ERP Systems.

**ERP Market and Vendors:** ERP Market – ERP Vendors – Service Oriented Architecture - ERP Package features.

**UNIT II**

**Extended ERP Services**: Defining Extended ERP – SCM and ERP – ERP and BI – ERP and E-Commerce. **Business Process Re-engineering And ERP:** Defining Business Process Reengineering- Enterprise redesign principles – Business process reengineering - BPR and Change Management – Different Approaches BPR Implementaion – Methodology for BPR Implementaion – Role of IT in BPR – BPR and EPR Systems – BPR sucess / failure factors.

**UNIT III**

**Planning for ERP** – Planning for ERP Implementaion – Understanding Organizational Requirements. - Understanding Economic and Strategies Justification – Analysing Project Scope – Determing Resources – Creating Budget for ERP Implementaion – Selecting the Right ERP Package- Preparing Organizations for ERP Implementaion. **Implementation of ERP:** Designing for ERP systems – ERP implementaion approaches – ERP implementaion Life cycle.

**UNIT IV**

**Managing ERP Projects:** Risk Failure factors in ERP Implementaion – Examples of ERP Failure- Mitigating implementaion risks – Management and complexity of Large scale ERP Projects- Training users to use ERP Systems. - Evaluating ERP Projets.

**UNIT V**

**ERP Going live and post implementaion:** Preparing to go live – Strategies for migration – to new ERP systems – Go live performance surprises – Managing ERP after go live – Maintenance of ERP Systems. **Expanding ERP Boudaries:** Service oriented architecture – Enterprises application integration – Application Services provider – Model for ERP implementaion.

**TEXT BOOKS:**

**Ashim raj singla – Enterprise Resource Planning – Cengage Learning india Pvt . Ltd 2008**