

KOVAI KALAIMAGAL COLLEGE OF ARTS AND SCIENCE (Autonomous)

1. 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.

2. 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 employment.”

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 skills 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 beings 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 intelligence
10. Entrepreneurship qualities
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 convenient 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 be 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 our professional knowledge for providing better living condition to the people.

PO12: Motivate the students to have longing for learning in order 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 intelligence	Realize one's own potential and acquire the skills to be emotionally balanced in stress full situations.
10	Entrepreneurship qualities	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 our professional knowledge for providing better living condition to the people.
12	Thirst for knowledge through life long learning	Motivate the students to have longing for learning in order 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 2019 – 2020)

1. REGULATIONS

This regulation is effective from the academic year 2019 -2020.

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
Continuous Internal Assessment Test I	05
Continuous 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	• Questions - either or type of question - 10 Marks each
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- 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) Job oriented Courses

Every student should complete one job oriented course of minimum 20hrs duration .The student may register either in PMKVY (supported by the central government) or other external agency. They should submit a certificate for the

successful completion of the training programme from the agency concerned at the end of the third semester.

l) Online Course

Students have to register online courses in NPTEL /SWAYAM /MOOC / COURSERA /EDX etc and can appear for the exam in same web portal or through End Assessment Examinations in our College.

m) Question paper pattern: (Self Study-Gandhian Thoughts and Women Rights)

Part A	50 Marks	5 Questions -10 Marks each – either or type.
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n) Question paper pattern : (General Awareness)

Part A	100 Marks	100 Questions -1 Marks each – objective type.
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o) 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

p) Extra-Curricular Activities

The first year students can enroll themselves for NSS / RRC /YRC / Sports & Games / Clubs and earn the credit allotted. Participation in any one of these activities during the first four semesters is mandatory.A report regarding satisfactory participation in the activity issued by the faculty incharge of the activity and approved by the Head of the Department has to be submitted to the CoE at the end of the fifth semester.

q) Co-curricular Activities

Participation of the students in any one of the activities conducted by other colleges during their courses of study is compulsory for the award of degree and it should be duly certified by the Head of the Department and submitted to the Controller of Examinations with a copy of the certificate of participation.

r) Internship

The students have the option to select any organisation – Government / Private like

industry, bank, Research & Development organisations, Scientific Companies, IT related service providers etc., in consultation with the staff Co-ordinator & Head of the Department. The students are to undergo training for a period of two weeks. The students must maintain a work diary and prepare a report of the training undergone and submit the same to the HoD on a stipulated date, there will be a viva voce with internal examiners at the end of the semester V.

Evaluation:

Content	Marks Awarded
Attendance	10
Work diary	15
Report	50
Viva Voce	25
TOTAL	100

This course carries 3 credit.

s) 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

t) The students who have opted for the languages other than Tamil in part-I should undergo basic Tamil Course during the 2nd year of the study as a non-credit course for which there would be only Internal Evaluation .

u) For all the non-credit courses result would be indicated as "Pass" or "Re-Appearance" and not by marks or grades secured in the grade sheet.

v) There will be one independent valuation for all theory papers of UG courses by external examiner. Except for self study subjects, value based subjects and Non-major Electives.

w) 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.

x) 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 is no improvement, there

shall not be any change in the original marks already awarded.

y) 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:

$$\text{GRADE POINT AVERAGE [GPA]} = \frac{\sum_i C_i G_i}{\sum_i C_i}$$

Sum of the multiplication of grade points by the credits of the courses

$$\text{GPA} = \frac{\text{-----}}{\text{Sum of the credits of the courses in a semester}}$$

For the Entire Programme:

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

Sum of the multiplication of grade points by the credits of the entire programme

$$\text{CGPA} = \frac{\text{-----}}{\text{Sum of the credits of the courses of the entire programme}}$$

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) (2019 – 2022)

Part	Subject code	Study Components	Ins. hours per week	CIA	EAE	Total	Credits
Semester – I							
I	19U1TALT01	Language 1 : Paper I Tamil I / Hindi I / French I / Malayalam I	5	25	75	100	3
II	19U1ENLT01	Language 2 : Functional English I	5	25	75	100	3
III	19U1MCCT01	Core 1 : Calculus	5	25	75	100	4
	19U1MCCT02	Core 2 : Algebra and Trigonometry	6	25	75	100	4
	19U1MCAT01	Allied 1 : Mathematical Statistics – I	5	25	75	100	4
IV	19U1VBET01	Value Based Education 1 : Environmental Studies*	2	-	50	50	1
	19U2VBET02	Value Based Education 2 : Yoga for Youth Empowerment*	2	-	-	-	-
	19U1SBST01	Skill Based Subject 1 : Mathematics for Competitive Examinations I	2	50	-	50	1
	19U1SBST02	Skill Based Subject 2 : Communication Skills-I	2	50	-	50	1
	-	Sports	2	-	-	-	-
Total						650	21
Semester – II							
I	19U2TALT02	Language 1 : Paper II Tamil II / Hindi II / French II / Malayalam II	5	25	75	100	3
II	19U2ENLT02	Language 2 : Functional English II	5	25	75	100	3
III	19U2MCCT03	Core 3 : Analytical Geometry of Three Dimensions	4	25	75	100	3
	19U2MCCT04	Core 4 : Programming in C	4	25	75	100	3
	19U2MCCP05	Core 5 : Programming in C – Practical	3	40	60	100	2
	19U2MCAT02	Allied 2 : Mathematical Statistics - II	5	25	75	100	4
IV	19U2VBET02	Value Based Education 2 : Yoga for Youth Empowerment *	2	-	50	50	4
	19U2VBET03	Value Based Education 3 : Ethics and Culture*	2	-	50	50	1
	19U2SBST03	Skill Based Subject 3 : Mathematics for Competitive Examinations II	2	50	-	50	1
	19U2SBST04	Skill Based Subject 4 : Communication Skills-II	2	50	-	50	1
	-	Sports	2	-	-	-	-

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						Total	800	25
Semester – III								
III	19U3MCCT06	Core 6: Vector Calculus & Fourier Series	6	25	75	100	4	
	19U3MCCT07	Core 7: Statics	6	25	75	100	4	
	19U3MCCT08	Core 8: Programming in C++	6	25	75	100	4	
	19U3MCCP09	Core 9: Programming in C++ -Practical	3	40	60	100	2	
	19U3MCAT03	Allied 3: Accountancy - I	6	25	75	100	4	
IV	19U3SBST05	Skill Based Subject 5 : Mathematics for Competitive Examinations III	2	50	-	50	1	
	19U3SBST06	Skill Based Subject 6 : Communication Skills III	2	50	-	50	1	
	19U3NMET01	Non Major Elective 1: Food Science and Nutrition	2	-	50	50	2	
	19U3NCCT01	Non Credit Course 1: Basic Tamil– I / Advance Tamil - I #	-	-	-	-	-	
		Job Oriented Courses	-	-	-	-	1	
	19U3SSCT01	Self Study Course 1: Manitha Vazhkayum Gandhi Adikalum *	-	-	50	50	1	
	-	Sports	2	-	-	-	-	
-	Library Work	1	-	-	-	-		
Total						700	24	
Semester – IV								
III	19U4MCCT10	Core 10: Differential Equations & Laplace Transforms	7	25	75	100	4	
	19U4MCCT11	Core 11: Dynamics	6	25	75	100	4	
	19U4MCCT12	Core 12: Data Structures using C++	5	25	75	100	4	
	19U4MCCP13	Core 13: Data Structures using C++ – Practical	3	40	60	100	2	
	19U4MCAT04	Allied 4: Accountancy – II	6	25	75	100	4	
IV	19U4SBST07	Skill Based Subject 7 : Mathematics for Competitive Examinations IV	2	50	-	50	1	
	19U4SBST08	Skill Based Subject 8 : Communication Skills IV	2	50	-	50	1	
	19U4NMET02	Non Major Elective 2: Floriculture	2	-	50	50	2	
	19U4NCCT02	Non Credit Course 2: Basic Tamil– II / Advance Tamil - II #	-	-	-	-	-	
	19U4SWCT01	Online Courses (SWAYAM/NPTEL)	-	-	-	-	1	
	19U4SSCT02	Self Study Course 2: Women Rights*	-	-	50	50	1	
-	Sports	2	-	-	-	-		
-	Library Work	1	-	-	-	-		
Total						700	24	

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Semester – V							
III	19U5MCCT14	Core 14: Real Analysis	6	25	75	100	4
	19U5MCCT15	Core 15: Modern Algebra	6	25	75	100	3
	19U5MCCT16	Core 16: Visual Basic	5	25	75	100	3
	19U5MCCP17	Core 17: Visual Basic – Practical	3	25	75	100	2
	19U5MCET1A	Elective 1: Optimization Techniques-I	5	25	75	100	3
	19U5MCET1B	Software Engineering					
	19U5MCET1C	Linear Algebra					
	19U5MCET2A	Elective 2: Numerical Methods	5	25	75	100	3
	19U5MCET2B	Number Theory					
19U5MCET2C	Digital Electronics and Computer Fundamentals						
IV	19U5NCCT01	Non Credit Course 1 : Aptitude and Soft Skills I	3	-	-	-	-
	19U5SSCT03	Self Study Course 3: General Awareness	-	-	100	100	1
		Internship: (15 days)	-	-	-	-	3
		Co-Curricular Activities: Participation in Seminars /Conferences /Workshops/Symposia.	-	-	-	-	1
	-	Sports	2	-	-	-	-
-	Library	1	-	-	-	-	
Total						700	23
Semester – VI							
III	19U6MCCT18	Core 18: Complex Analysis	6	25	75	100	4
	19U6MCCT19	Core 19: Discrete Mathematics	6	25	75	100	3
	19U6MCCT20	Core 20: MATLAB	5	25	75	100	3
	19U6MCCP21	Core 21: Mat Lab –Practical	3	40	60	100	2
	19U6MCCV22	Core 22: Project Work and Viva Vice	-	80	20	100	4
	19U6MCET3A	Elective 3: Optimization Techniques-II	5	25	75	100	3
	19U6MCET3B	Actuarial Mathematics					
	19U6MCET3C	Information Security					
	19U6MCET4A	Elective 4: Fuzzy Mathematics	5	25	75	100	3
19U6MCET4B	Graph Theory						
19U6MCET4C	Computer Networks						
IV	19U6NCCT02	Non Credit Course 2: Aptitude and Soft Skills II	3	-	-	-	-
		Extra Curricular Activities NSS/RRC/YRC/Sports & Games/ Clubs	-	-	-	-	1
	-	Sports	2	-	-	-	-
-	Library	1	-	-	-	-	
Total						700	23
Total							140

- * Answer to the question 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.

EXTRA CREDIT COURSES		
Course Code	Subjects	Credits
2019ECC001	சுற்றுலா வளர்ச்சி	2
2019ECC002	இதழியல் கலை	2
2019ECC003	நாட்டுப்புறவியல்	2
2019ECC004	கணிப்பொறியில் தமிழ்	2
2019ECC005	தமிழக வரலாறும் மக்கள் பண்பாடும்	2
2019ECC006	தமிழ் இலக்கிய வரலாறு	2
2019ECC007	New Media	2
2019ECC008	Proofreading And Copyediting	2
2019ECC009	Personality Development	2
2019ECC010	Technical Writing	2
2019ECC011	An Introduction To Psychology	2
2019ECC012	Astronomy	2
2019ECC013	Fuzzy Mathematics	2
2019ECC014	Operations Research	2
2019ECC015	Mathematics For Professional Courses	2
2019ECC016	Multimedia And Its Applications	2
2019ECC017	Management Information System	2
2019ECC018	Theory Of Computation	2
2019ECC019	Oops With Java Programming	2
2019ECC020	Programming In C	2

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2019ECC021	Internet Of Things	2
2019ECC022	Web Technology And Its Applications	2
2019ECC023	Network Security	2
2019ECC024	Mobile And Wireless Technology	2
2019ECC025	Cloud Computing	2
2019ECC026	Cross Culture Management	2
2019ECC027	Indian Economy And Trade Dependencies	2
2019ECC028	Export Marketing	2
2019ECC029	International Trade & Forex	2
2019ECC030	Brand Management	2
2019ECC031	Stress Management	2
2019ECC032	Risk And Insurance In International Trade	2
2019ECC033	Retail Marketing	2
2019ECC034	Export And Import Procedures	2
2019ECC035	Logistics And Supplychain Management	2
2019ECC036	Quality Management	2
2019ECC037	Management Of Small And New Enterprises	2
2019ECC038	Tourism Management	2
2019ECC039	Event Management	2
2019ECC040	Hospitality Management	2
2019ECC041	Consumer Behaviour	2
2019ECC042	Human Resource Management	2
2019ECC043	Principles And Practice Of Marketing Services	2
2019ECC044	Consumer Marketing	2
2019ECC045	Marketing Of Health Services	2
2019ECC046	International Banking	2

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2019ECC047	E-Commerce	2
2019ECC048	International Accounting	2
2019ECC049	Corporate Social Responsibility And Governance	2
2019ECC050	Enterprise Resource Planning	2

CURRICULUM STRUCTURE

S.No.	Courses	No. of. Courses	Credits
1	Language 1:Tamil/Hindi/Malayalam/French	02	06
2	Language 2: English	02	06
3	Core Courses	22	72
4	Allied Courses	04	16
5	Elective Courses	04	12
6	Value Based Education	03	06
7	Skill Based Subject	08	08
8	Non Major Elective	02	04
9	Non Credit Courses	02	-
10	Job Oriented Courses	01	01
11	Online Courses	01	01
12	Self Study Courses	03	03
13	Internship (15 days)	01	03
14	Co-Curricular Activities:	01	01
15	Extra Curricular Activities	01	01
Total Credits			140 Credits

SEMESTER I

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U1TALT01	Title : Tamil - I	Batch	2019-2022
Hrs/week	5		Semester	1
			Credits	3

நோக்கம்

- சமூகம் பற்றிய சிந்தனைகளைத் தமிழ்ப் படைப்பிலக்கியங்கள் மூலம் ஏற்படுத்துதல் புதுக்கவிதைகள், சிறுகதைகள் ஆகியவற்றைப் வாசிக்க வைத்தல், எழுத வைத்தல்
- தமிழ்நாடு அரசுப்பணியாளர் போட்டித்தேர்வு மையம் நடத்தும் போட்டித் தேர்வுகளுக்கு மாணவர்களைத் தயார் செய்தல்.
- மாணவர்களின் வாசிக்கும் ஆற்றலை ஊக்குவிக்கவும், தமிழ் இலக்கியத்தோடு தொடர்புடைய பிற நூல்களையும் மாணவர்கள் சுயமாக கற்று உணர்ச்செய்தல்
- மாணவர்கள் பிழையில்லாமல் எழுதுவதற்கும், பேசுவதற்கும், கருத்துப்பரிமாற்றத்திற்கும் இலக்கணம் உதவுகின்றன என்பதை அறிந்துகொள்ளல்.

பாடப்பகுதி கற்றலின் வெளிப்பாடு - Course Outcome (CO)

CO Number	CO Statement
CO1	தமிழ் மொழியின் வாயிலாக பண்பாடு, கலைகள் மற்றும் மரபுகள் முதலியவற்றை அறிதல்.
CO2	வாழ்வியல் நெறிகளை உணர்ந்து மனிதநேயத்துடனும் உயர்ந்த குறிக்கோளுடனும் சமுதாயத்தை நேசிக்கத் தகுந்தவர்களாக இருத்தல்.
CO3	இலக்கியங்களின் வாயிலாக பல்வேறு வகையான வாழ்க்கைத்தரம் மற்றும் மக்களின் வாழ்க்கை முறைகளைத் தெரிந்து கொள்ளுதல்.
CO4	அறத்தின் வழிநின்று பொருளீட்டி இன்பம் துய்ப்பது உன்னத வாழ்வின் அடிப்படை என்பதை இலக்கியங்கள் வாயிலாக மாணவர்கள் உணர்தல்.
CO5	சமூகம் மற்றும் பெண்ணியம் சார்ந்த கவிதைகளும், கருத்து பரிமாற்றத்திறனுக்கு அடிப்படையாக உள்ள இலக்கணமும், இன்றைய சமுதாய நிகழ்வுகளைப் பிரதிபலிக்கும் சிறுகதையும், தன்முயற்சிப்படிப்பின் வாயிலாக, நமது ஊரின் சிறப்புகளையும் மற்றும் வரலாற்றுச் செய்திகளையும் மாணவர்கள் அறிந்து கொள்ள செய்தல்.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்

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 (10 மணிநேரம்)

- பாரதியார் - புதுமைப்பெண் (பாரதியார் கவிதைகள்)
- பாரதிதாசன் - புத்தகச் சாலை (பாரதிதாசன் கவிதைகள்)

3. கவிமணி - புத்தரும் ஏழைச் சிறுவனும் (மலரும் மாலையும்)
 4. கண்ணதாசன் - பிறப்பில் வருவது (கண்ணதாசன் கவிதைகள்)
- அலகு - 2 செய்யுள் திரட்டு : புதுக் கவிதைகள் (13 மணிநேரம்)**
1. புவியரசு - ரகசியம் (ஒரு முக்கிய அறிவிப்பு)
 2. சிற்பி - தெற்கு வளைவு பாட்டையா (ஒரு கிராமத்து நதி)
 3. அப்துல் ரகுமான் - மாதிரி (ஆலாபனை)
 4. வைரமுத்து - மரங்களைப் பாடுவேன் (வைரமுத்து கவிதைகள்)
 5. கனிமொழி - என் வீடு (கருவறை வாசனை)
 6. முத்துக்குமார் - தூர் (பட்டாம்பூச்சி விற்பவன்)
 7. திலிப் குமார் - எனது மௌனங்கள் (ஒத்திகை)
 8. சுடலைமணி - பிறந்தநாள் பூங்கா (நட்சத்திரக்கிழவி)

அலகு - 3 சிறுகதைத் தொகுப்பு (13 மணிநேரம்)

1. புதுமைப்பித்தன் - காஞ்சனை.
 2. ராஜம்கிருஷ்ணன் - சூரியக்கதிர்கள். (பெண்மையச் சிறுகதைகள்)
 3. தி.ஜானகிராமன் - சிலிர்ப்பு. (கொட்டுமேளம்)
 4. பிரபஞ்சன் - எனக்கும் தெரியும் (நேற்று மனிதர்கள்).
 5. முத்துலிங்கம் - தாத்தா விட்டுப்போன தட்டச்சு மிசின் (கொழுத்தாடு பிடிப்பேன்)
 6. வேணுகோபால் - தீரா துயரம், (ஒரு துளி துயரம்)
 7. வெ. சுப்ரமணியபாரதி - மயங்கும் மனங்கள் (மரணித்த கணவனின் டைரி)
 8. தாமரை - பசுத்தோல் (சந்திரக் கதிர்கள்)

அலகு 4 இலக்கணம், பயன்பாட்டுத்தமிழ் (12 மணி நேரம்)

1. நிறுத்தற் குறிகள் இடும் இடங்கள் - காற்புள்ளி, அரைப்புள்ளி, முக்காற்புள்ளி, முற்றுப்புள்ளி, புள்ளி, உணர்ச்சிக்குறி, கேள்விக்குறி, இரட்டை மேற்கோள்குறி, ஒற்றைமேற்கோள் குறி.
 2. ஒருமை, பன்மை பிழைகளை நீக்குதல், மரபு பிழைகள், வழுஉச்சொற்களை நீக்குதல், பிறமொழிச் சொற்களை நீக்குதல்.
 3. சொற்களை சேர்த்தும் இடம் விட்டும் எழுதுதல் - 1. பெயர் + பெயர், 2. பெயர் + வினை, 3. வினை + வினை, 4. இரட்டைச் சொற்கள், 5. இடைச்சொற்கள்

அலகு 5 இலக்கிய வரலாறு (12 மணி நேரம்)

1. சிறுகதையின் தோற்றமும் வளர்ச்சியும்.
 2. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்.
 3. இலக்கணம் தோற்றமும் வளர்ச்சியும்.
 4. தன்முயற்சி படிப்பு : தெரிந்த கோவை தெரியாத கதை
 ஆசிரியர் : கவியன்பன். கே.ஆர் பாபு
 வெளியீடு : விஜயா பதிப்பகம்
 கோயம்புத்தூர்.

பாடநூல் - செய்யுள் திரட்டு (தொகுப்பு) தமிழ்த்துறை வெளியீடு 2019
பார்வை நூல்கள்

வ.எண்	ஆசிரியர் பெயர்	நூலின் பெயர்	வெளியீடு
1	புலவர் வெற்றியழகன் (தொ.ஆ),	பாரதியார் கவிதைகள்	ராமையா பதிப்பகம், சென்னை.
2	தொ.பரமசிவன் (ப.ஆ)	பாரதிதாசன் கவிதைகள்	நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை.

Scheme and Regulations - 2019-2022 (SR-4) – B.Sc. Mathematics (CA)

3	வித்துவான் சிவ கன்னியப்பன்	மலரும் மாலையும்	பூம்புகார் பதிப்பகம், சென்னை.
4	கவியரசு கண்ணதாசன்	கண்ணதாசன் கவிதைகள்	கலைக்காவிரி பதிப்பகம், திருச்சி.
5	புவியரசு	ஒரு முக்கிய அறிவிப்பு	விஜயா பதிப்பகம், கோவை.
6	சிற்பி	ஒரு கிராமத்து நதி	கவிதா பதிப்பகம் சென்னை.
7	அப்துல் ரகுமான்	ஆலாபனை	நேசனல் பப்ளிஷர்ஸ், சென்னை.
8	வைரமுத்து	வைரமுத்து கவிதைகள்	சூர்யா வெளியீடு, சென்னை.
9	குனிமொழி	கருவறை வாசனை	திருமகள் நிலையம் சென்னை.
10	முத்துக்குமார்	பட்டாம்பூச்சி விற்பவன்	வம்சி கிராபிக்ஸ்இ சென்னை.
11	திலிப் குமார்	ஓத்திகை	நியூ சென்சரி புக ஹைஸ், சென்னை
12	ப.சுடலைமணி	நட்சத்திரக்கிழவி (கவிதைத் தொகுப்பு)	--
13	புதுமைப்பித்தன்	புதுமைப்பித்தன் கதைகள்	பூம்புகார் பதிப்பகம், சென்னை.
14	தி. ஜானகிராமன்	கொட்டுமேளம்	ஐந்திணைப் பதிப்பகம்
15	பிரபஞ்சன்	நேற்று மனிதர்கள்	கவிதா பப்ளிகேசன்
16	முத்துலிங்கம்.அ	கொழுத்தாடு பிடிப்பேன்	காலச்சுவடு பதிப்பகம்
17	வேணுகோபால்.சு	ஒரு துளி துயரம்	விஜயா பதிப்பகம், கோவை.
18	வெ. சுப்ரமணியபாரதி	மரணித்த கணவனின் டைரி	டிஸ்கவரி புக பேலஸ்
19	தூமரை	சந்திரக் கற்கள்	குமரன் பதிப்பகம்
20	வல்லிக்கண்ணன்	புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்	அகரம் பதிப்பகம்,, கும்பகோணம்.
21	கா.கோ.வெங்கட்ராமன்	தமிழ் இலக்கிய வரலாறு	கலையக வெளியீடு, திண்டுக்கல்.
22	மது.ச.விமலானந்தம்	தமிழ் இலக்கிய வரலாறு	முல்லை நிலையம், சென்னை.
23	மு.பரமசிவம்	நற்றமிழ் இலக்கணம்	சைவசித்தாந்த பதிப்பகம், திருநெல்வேலி.
24	கவியன்பன். கே.ஆர் பாபு	தெரிந்த கோவை தெரியாத கதை	விஜயா பதிப்பகம் கோயம்புத்தூர்.

SEMESTER I

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U1FRLT01	Title : French I	Batch	2019-2022
Hrs/week	5		Semester	1
			Credits	3

SYLLABUS

Prescribed text: **LATITUDES I**

Units : 1 – 4

Authors : Régine Mérieux
Yves Loiseau

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

Maximum Marks: 75 **Time: 3 hrs.**

(All questions to be set only from the prescribed text)

Section A (10)

1. Choisissez la meilleure réponse: (10X1=10)

Section B (25)

2. Dites vrai ou faux (5X1=5)
3. Traduisez les textes suivants en anglais:(4/5) (4X5=20)

Section C (40)

4. Compréhension (5x1=5)
5. Exercices de grammaire:(5X5=25) **(either/or)**
6. Remplissez le dialogue:(5X1=5)
7. Associez :(5X1=5)

SEMESTER I

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U1HILT01	Title : Hindi I	Batch	2019-2022
Hrs/week	5		Semester	1
			Credits	3

SYLLABUS**1. PROSE : NUTHAN GADYA SANGRAH**

Editor : Jayaprakash

(Prescribed Lessons – only 6)

Lesson 1 – Bharathiya 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 BHARAT 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 :	19U1MLLT01	Title : Malayalam I	Batch	2019-2022
			Semester	1
Hrs/week	5		Credits	3

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

Pathummayude Aadu - Vaikam Muhammed Basheerr
(D.C.Books, Kottayam, Kerala)

Unit III & IV

Ente Priyappeta Kadhakal – Akbar Kakkattil)
(D.C. Books, Kottayam, Kerala)

Unit V

Expansion of ideas, General Eassay and Translation. (A simple passage from English about 100 works to Malayalam)

Reference Books:

- 1.Malayala Novel Sahithya Charitram-K.M.Tharakan (N.B.S.Kottayam)
- 2.Chelukatha Innale Innu-M.Achuyuthan (D.C Books, Kottayam)
- 3.Sahithya Charitram Prasthanangalilude- Dr.K.M George,
(D.C.Books Kottayam)
4. Malayala Sahithya vimarsam-Sukumar Azhee kode (D.C.books)

SEMESTER-I

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code:	19U1ENLT01	Language II-Functional English – I	Batch	2019-2022
Hrs/ Week	5 Hrs		Semester	I
			Credits	3

COURSE OBJECTIVES:

To enable the students

- To understand the basic grammar in English.
- To acquaint students with the structure and strategies of conversation
- To make the students appreciate the significant works and style of prose
- To develop the skills of speaking and writing without flaws.
- To develop an interest in the minds of the students to enjoy and appreciate the literary works in English.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	Speak and Write without committing grammatical errors.
CO2	Read and appreciate simple literary works.
CO3	Deal with various conversational situations with confidence.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT –I-POETRY****(Hours-12)**

1. The Lotus Eaters - Alfred Lord Tennyson
2. Menelaus and Helen - Rupert Brooke
3. Night of the Scorpion - Nizzim Ezekiel

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

1. My Vision for India - Abdul Kalam
2. A Speech by N. R. Narayana Murthy - N. R. Narayana Murthy

3. A Little Bit of what You Fancy - Desmond Morris

UNIT- III- Short Story **(Hours-12)**

1. The Happy Prince - Oscar Wilde
2. An astrologer's day - R. K. Narayan
3. The Blue Bouquet - Octavio Paz

UNIT-IV-Grammar and Composition **(Hours-12)**

1. Modals
2. Verbs
3. Pronoun
4. Letter Writing
5. Reading Comprehension

UNIT- V- Dialogue Writing (CONVERSATION EXERCISES) **(Hours-12)**

- 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
3.	Adibah Amin, Rosemary Eravelly, Farida J Ibrahim	Grammar Builder Level Volume 1	Cambridge University Press

Means of Curricular Delivery: Lecture, Group Learning, Seminar, Assignment, Google Class Room.

SEMESTER I

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U1MCCT01	Title : Core 1 - Calculus	Batch	2019-2022
			Semester	I
Hrs/week	5 Hrs.		Credits	4

COURSE OBJECTIVES

To enable the Students

- To gain knowledge about Envelope, Curvature and Evolute of Curve
- To evaluate Integral calculus for various forms.
- To understand the concept of Proper and improper integrals.
- To know how to evaluate multiple integrals.
- To know Beta, Gamma functions, Jacobians their properties and their application.

COURSE OUTCOMES (CO)

On successful completion of the course, students should 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 using 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****(12 Hrs)**

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

UNIT II**(12 Hrs)**

Evolute and Involute – Radius of Curvature when the curve is given in

Polar Co-ordinates - Pedal equation of curves – Chord of Curvature.

UNIT III**(12 Hrs)**

Evaluation of integrals of the form $\int \left[\frac{f'(x)}{f(x)} \right] dx$, $\int \left[\frac{px+q}{\sqrt{ax^2+bx+c}} \right] dx$, $\int \sqrt{\frac{(x-a)}{b-x}} dx$, $\int \sqrt{(x-a)(x-b)} dx$, $\int \left[\frac{1}{a\cos x + b\sin x + c} \right] dx$, $\int \left[\frac{1}{a\cos^2 x + b\sin^2 x + c} \right] dx$, 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 $\int e^{ax} \cos bx dx$, $\int e^{ax} \sin bx dx$.

UNIT IV**(12 Hrs)**

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**(12 Hrs)**

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

- www.sakshieducation.com/engg/.../M1_curvature
- https://mathinsight.org/double_integral_introduction
- 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 :	19U1MCCT02	Title : Core 2 -Algebra and Trigonometry	Batch	2019-2022
Hrs/week	6 Hrs.		Semester	I
			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
- To know about the Descartes' Rule of signs-Rolle's Theorem and Horner's method.
- To understand the concepts of Logarithm of a complex numbers and Summation of Trigonometric Series.

COURSE OUTCOMES (CO)

On successful completion of the course, students should 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****(15 Hrs)**

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

to summation only.

UNIT II (15 Hrs)

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

UNIT III (15 Hrs)

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 Hrs)

Expansion of $\text{Cos}^n\theta$, $\text{Sinn}\theta$, $\text{Cos}^n\theta$ and $\text{Sin}^n\theta$ in powers of $\sin\theta$ and $\cos\theta$ - Separation of real and imaginary parts of $\text{Sin}(\alpha+i\beta)$, $\text{cos}(\alpha+i\beta)$, $\text{Tan}(\alpha+i\beta)$.

UNIT V (15 Hrs)

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	Trigonometry 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

- <https://www.mathplanet.com/education/algebra-2/sequences-and-series/binomial-theorem>
- <https://oregonstate.edu/instruct/mth251/cq/Stage7/Lesson/rolles.html>
- <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 :	19U1MCAT01	Title : Allied 1 - Mathematical Statistics - I	Batch	2019-2022
			Semester	I
Hrs/week	5 Hrs.		Credits	4

COURSE OBJECTIVES

To enable the students

- To understand concepts of probability and Random variable
- To learn about Discrete and Continuous probability distributions.
- To know about moment generating and characteristics function and their properties.
- To understand the concepts of 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****(12 Hrs)**

Theory of probability - Classical and axiomatic definition of probability-Addition and Multiplication theorems-Independent events-Theorems on Independent events-Definition of

conditional probability-Problems-Bayes theorem-Theorem of total probability.

UNIT II (12 Hrs)

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 (12 Hrs)

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 (12 Hrs)

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 (12 Hrs)

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	Fundamentals of Mathematical Statistics	Sultan Chand and Sons
2	R.S.N. Pillai, V. Bagavathi	Statistics	S. Chand and Co

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	Elements of Mathematical Statistics	Sultan Chand & 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

- <https://en.wikibooks.org/wiki/Statistics>
- <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:	19U1VBET01	Value Based Education 1: Environmental Studies	Batch	2019-2022
			Semester	I
Hrs/ Week	2 Hrs		Credits	1

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

(5 Hrs)

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

(5 Hrs)

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

(5 Hrs)

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. Threats 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

(5 Hrs)

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: Floods, Earthquake, Cyclone and Landslides.

UNIT V

(5 Hrs)

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 Curriculum Delivery: Lecture, Group Learning, Seminar, Assignment, Case Studies, Google Classroom.

SEMESTER - I

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code:	19U1VBET02	Value Based Education 2: Yoga for Youth Empowerment	Batch	2019-2022
			Semester	I
Hrs/ Week	2 Hrs		Credits	-

COURSE OBJECTIVES

- To Provide the value Education and improve the students good character
- To understand the yogic life and physical health
- To maintain youthfulness and moderation in five aspects of life
- To enable the students concentration and personality development
- To understand the law of nature and yogasanas

SYLLABUS

UNIT I

(5 Hrs)

Philosophy of life science

Life – purpose of life – philosophy of life – Law of Nature – Kindness towards living belongs preserving Natural Resources.

அலகு 1: வாழ்வியல் தத்துவம்

வாழ்க்கை - வாழ்வின் நோக்கம் -வாழ்க்கைத் தத்துவம் -இயற்கை நியதி -பிற உயிர் பேணல் -இயற்கை வளம் காத்தல்

UNIT II

(5 Hrs)

Human values

culture – Analysis of Thought – Moralization of Desire – Neutralization of Anger – Eradication of worry – Blessings and Benefits – Harmonious Friendship – Love and Compassion – Individuals peace.

அலகு 2: தனிமனித பண்புகள்

பண்பாடு -எண்ணம் ஆராய்தல் -ஆசை சீரமைத்தல் -சினம் தவிர்ந்தல் -கவலை ஒழித்தல் -வாழ்த்தும் பயனும - நட்பு நலம் - அன்பும் கருணையும் - தனிமனித அமைதி.

UNIT III

(5 Hrs)

Social Values

Family – family peace – Society – Life Style – vworld Brotherhood – Greatness of women – Five Duties – Economics – Hygiene and Health Care – Education – politics – Responsibilities.

அலகு 3: சமுதாய மதிப்புகள்

குடும்பம் - குடும்ப அமைதி - சமுதாயம் - வாழ்க்கை முறை - உலக சகோதரத்துவம் -

பெண்ணின் -பெருமை - ஐவகைக் கடமைகள் -பொருளாதாரம் -சுகாதாரம் -கல்வி -அரசியல் -மக்களின் பொறுப்பு -உலக அமைதி

UNIT IV

(5 Hrs)

Development of Mental Prosperity

Prosperity of Mind – Life force – Bio-magnetism and mind – Functions of mind mental frequency – Ten stages of mind – genetic centre – Meditation – value of spirituality – universal Magnetism and Bio- Magnetism.

அலகு 4 : மனிதவள மேம்பாடு

மனவளம் - உயிரும் மனமும் - உயிரின் இயக்க மையம் - மனத்தின் செயல்கள் - மன அலைச்சுழல் - மன இயக்கப் படி நிலைகள் - கருமையம் - தவம்(தியானம்) - ஆன்மீக மதிப்பு - வான்காந்தம் - சிவகாந்தம்

UNIT V

(5 Hrs)

Maintenance of physical Health

Structure of Human Body – Three Functional Bodies – Harmony between Body and Life Force – Pain, Diseases and Death – Reasons for Disease – Limit and Method in Five Factors – Simplified physical Exercises – Practice for simplified Physical Exercises.

அலகு 5 :உடல் நலம் பேணல் உடலமைப்பு உடலின் மூவகை இயக்க மையங்கள் உடலுக்கும் உயிருக்குமான உறவு நோய்க்கான காரணங்கள் ஐந்தில் அளவு முறை எளியமுறை உற்பயிற்சி யோகாசனங்கள் கதிரவன் வணக்கம் தண்டாசனம் சக்கராசனம் பக்கவாட்டில் விருச்சாசனம் ஏகபாத ஆசனம் திரிகோணாசனம் வஜ்ராசனம் பத்மாசனம் யோக முத்ரா மகா முத்ரா உஸ்டராசனம் வக்ராசனம் சவாசனம்

TEXT BOOKS:

Recent editions of the following books only are recommended

S. No.	Author Name	Title of the Book	Publisher
1.	Vethathiri Maharishi	Journey of Consciousness	Vethathiri Publications, Erode
2.	Vethathiri Maharishi	Simplified Physical Exercises	Vethathiri Publications, Erode
3.	Vethathiri Maharishi	Unified Force	Vethathiri Publications, Erode
4.	Thathuvagnani Vethathiri Maharishi	Yoga for Modern Age	-
5.	Dr.Chandrasekaran	Sound Health Through Yoga	Prem Kalyan Publications, Madurai

SEMESTER I

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U1SBST01	Title : Skill Based Subject 1 - Mathematics For Competitive Examinations – I	Batch	2019-2022
Hrs/week	2 Hours		Semester	I
			Credits	1

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****(5 Hrs)**

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

UNIT II**(5 Hrs)**

Square Roots and Cube Roots – Average - Problems on Numbers

UNIT III**(5 Hrs)**

Problems on Ages - Surds and Indices-Percentage

UNIT IV (5 Hrs)

Races and games of skill – Calendar

UNIT V (5 Hrs)

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 Reasoning,	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-I

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code:	19U1SBST02	Skill Based Subject 2 - Communication Skills- I	Batch	2019-2022
			Semester	I
Hrs/ Week	2 Hrs		Credits	1

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 listening 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 the 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 listening and be a careful listener
CO3	To deal with different kinds of situations by conversing effectively and maintaining the etiquette required for such situations

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT –I**

- What's a sentence
- Types of Sentences
- Articles
- Preposition

UNIT- II

- Homophones- An Introduction
- Homonyms
- One Word Substitution
- Cloze Test

UNIT- III

- Communication – An Introduction
- E- Mail Drafting and Etiquette
- Interviews

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	Technical English – II	Vijay Nicole Imprints Pvt.Ltd.

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

SEMESTER II

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U2TALT02	Title : Tamil – II	Batch	2019-2022
Hrs/week	5		Semester	1
			Credits	3

நோக்கம்

- சமூகம் பற்றிய சிந்தனைகளைத் தமிழ்ப் படைப்பிலக்கியங்கள் மூலம் ஏற்படுத்துதல்
- இலக்கியங்கள், உரைநடைகள் ஆகியவற்றை வாசிக்க வைத்தல் மற்றும் விழிப்புணர்வை ஏற்படுத்துதல்.
- அடிப்படைத் தமிழ் இலக்கணத்தையும், பயன்பாட்டுத் தமிழான மொழிபெயர்த்தல், கடிதம் மற்றும் மடல்கள் எழுதுதல் பற்றியும் மாணவர்களை அறியச் செய்தல்.
- தமிழ்நாடு அரசுப்பணியாளர் போட்டித்தேர்வு மையம் நடத்தும் போட்டித் தேர்வுகளுக்கு மாணவர்களைத் தயார் செய்தல்.
- மாணவர்களின் வாசிக்கும் ஆற்றலை ஊக்குவிக்கவும், தமிழ் இலக்கியத்தோடு தொடர்புடைய பிற நூல்களையும் மாணவர்கள் சுயமாக கற்று உணரச்செய்தல்

பாப்பகுதி கற்றலின் வெளிப்பாடு - Course Outcome (CO)

CO Number	CO Statement
CO1	தமிழ் மொழியின் வாயிலாக பண்பாடு, கலைகள் மற்றும் மரபுகள் முதலியவற்றை அறிந்தல்.
CO2	நீதி இலக்கியங்கள், பக்தி இலக்கியங்கள் மூலம் வாழ்வியல் நெறிமுறைகளை அறிதல். உயர்ந்த நோக்கத்துடன், சமுதாயத்தை நேசிக்கத் தகுந்தவர்களாக இருத்தல்.
CO3	தமிழ் இலக்கியங்கள் வாயிலாக பல வகையான வாழ்க்கைத்தரம், மற்றும் மக்களின் வாழ்க்கை முறைகளைத் தெரிந்து கொள்ளுதல்.
CO4	அறத்தின் வழிநின்று பொருளீட்டி இன்பம் துய்ப்பது உன்னத வாழ்வின் அடிப்படை என்பதை இலக்கியங்கள் வாயிலாக மாணவர்கள் உணர்தல்.
CO5	சமுதாயம் மற்றும், கலைகள் சார்ந்த கவிதைகள் மற்றும் உரைநடைகளும், கருத்து பரிமாற்றத்திறனுக்கு உரிய அடிப்படை தமிழ் இலக்கணம் மற்றும் பயன்பாட்டுத் தமிழுக்குரிய பகுதியும், தன்முயற்சிப்படிப்பின் வாயிலாக, பேச்சுக்கலையின் முக்கியத்துவம், தேவை மற்றும் திறன்களை மாணவர்கள் அறிந்துகொள்ளல்.

நிர்ல் விளைவுகளைக் கொண்ட வரைபடம்

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

பாடத்திட்டம்

அலகு 1 நீதி நூல்கள்

13 மணி நேரம்

1. திருக்குறள் - இன்னா செய்யாமை, பொறையுடைமை, விருந்தோம்பல் (3 அதிகாரம்)
2. முதுமொழிக்காஞ்சி - அறிவுப்பத்து, சிறந்து பத்து
3. பழமொழி நானூறு - 21 முதல் 30 வரை (10 பாடல்கள்)
4. நீதிநெறி விளக்கம் - 1- 10 முதல் (பத்து பாடல்கள்)

அலகு 2 பக்தி இலக்கியங்கள் **15 மணி நேரம்**

1. குற்றாலக் குறவஞ்சி - குறத்தி மலைவளம் கூறல் 62 - 63 (6 பாடல்கள்)
2. அபிராமி அந்தாதி - தனம் தரும் கல்வி தரும், பதினாறு பேறுகள் (2 பாடல்)
3. தேவாரம் - பொது- நின்ற திருத்தாண்டகம் - 670 (திருநாவுக்கரசு சுவாமிகள்)
4. நாலாயிரத்திவ்ய பிரபந்தம் - ஊனேறு செல்வத் துடற்பிறவி யான் வேண்டேன் (குலசேகராழ்வார் - 10 பாடல்).
5. திருமந்திரம் - கல்வி (10 பாடல்)

அலகு 3 உரைநடைத்தொகுப்பு **10 மணி நேரம்**

1. நாஞ்சில் நாடன் - ஆதியில் சொல் இருந்தது. (திகம்பரம்)
2. சிற்பி - வீரத்துறவி விவேகானந்தர் (சிற்பியின் கட்டுரைகள்)
3. டாக்டர் அ. தட்சிணாமூர்த்தி - ஓவியக்கலை (தமிழர் நாகரிகமும் பண்பாடும்)
4. டாக்டர் எம்.ஆர். விஜயகுமார் - அறிவியலும் ஆன்மீகமும் (பிரபஞ்ச ரகசியம்)
5. மஞ்சை வசந்தன் - உளவியல் (பழமொழி வழங்கும் பல்துறைச் சிந்தனைகள்)

அலகு 4 இலக்கணம், பயன்பாட்டுத்தமிழ் **10 மணி நேரம்**

1. சொல் வகைகள் - பெயர், வினை, இடை, உரி
2. வாக்கியம், வாக்கிய வகைகள், வினை வகைகள் - 1. செய்வினை, 2. செய்ப்பாட்டுவினை, 3. தன்வினை, பிறவினை, 4. உடன்பாட்டுவினை, 5. எதிர்மறைவினை
3. மொழிபெயர்த்தல், விண்ணப்பம், மடல்கள் எழுதுதல்.

அலகு 5 இலக்கிய வரலாறு **10 மணி நேரம்**

1. உரைநடையின் தோற்றமும் வளர்ச்சியும்
2. சிற்றிலக்கியங்களின் தோற்றமும் வளர்ச்சியும்.
3. நாயன்மார்கள், ஆழ்வார்கள்
4. நீதி நூல்கள்
5. தன்முயற்சிப் படிப்பு : பேசும் கலை

முனைவர் கு.ஞானசம்பந்தன்
விஜயா பதிப்பகம், கோயம்புத்தூர்.

பாடநூல் - செய்யுள் திரட்டு (தொகுப்பு) தமிழ்த்துறை வெளியீடு 2019 பார்வை நூல்கள்

வ. எண்	ஆசிரியர் பெயர்	நூலின் பெயர்	வெளியீடு
1	உ.வே சாமிநாதையர்	குறுந்தொகை	கழக வெளியீடு
2	புலவர் நா.இராமையாபிள்ளை (உ.ஆ)	நற்றிணை	வர்த்தமானன் பதிப்பகம், சென்னை.

Scheme and Regulations - 2019-2022 (SR-4) – B.Sc. Mathematics (CA)

3	இ.வை அனந்தராமையர்	கலித்தொகை,	கழக வெளியீடு
4	டாக்டர் உ.வே. சாமிநாதையர்	புறநானூறு,	கழக வெளியீடு
5	பரிமேலழகர்	திருக்குறள்	பூம்புகார் பதிப்பகம்
6	பதினெண் கீழ்க்கணக்கு நூல்கள் - மதுரைக் கூடலூர்க் கிழார்	முதுமொழிக்காஞ்சி	தமிழ் இணையப் பல்கலைக்கழகம்
7	பதினெண் கீழ்க்கணக்கு நூல்கள் - முன்றுறையரையனார்	பழமொழி நானூறு	தமிழ் இணையப் பல்கலைக்கழகம்
8	குமரகுருபரர்	நீதிநெறி விளக்கம்	தமிழ் இணையப் பல்கலைக்கழகம்
9	திரிகூடராசப்பக் கவிராயர் (புலியூர் கேசிகன் உரை)	திரு குற்றாலக் குறவஞ்சி	பாரி நிலையம் வெளியீடு
10	அபிராமிபட்டர்	அபிராமி அந்தாதி	தமிழ் இணையப் பல்கலைக்கழகம்
11	தேவாரம் - திருநாவுக்கரசர்	தேவாரம் - 6 ஆம் திருமுறை (பொது - நின்றதிருத்தாண்டகம்)	வர்த்தமானன் பதிப்பகம், சென்னை.
12	குலசேகராழ்வார்	நாலாயிரத்திவ்ய பிரபந்தம்	லிட்டில் ப்ளவர் கம்பெனி - சென்னை
13	திரு.அ. சிதம்பரனார்	திருமந்திரம்	தென்னிந்திய சைவசித்தாந்த நூற்பதிப்புக் கழகம், சென்னை.
14	நாஞ்சில்நாடன்	திகம்பரம் (கட்டுரைத் தொகுப்பு)	விஜயா பதிப்பகம் கோவை.
15	டாக்டர் இரா. மோகன்	சிற்பியின் கட்டுரைகள்	மணிவாசகர் பதிப்பகம் சென்னை.
16	டாக்டர் அ. தட்சிணாமூர்த்தி	தமிழர் நாகரிகமும் பண்பாடும்	யாழ் வெளியீடு
17	மஞ்சை வசந்தன்	பலமொழி வழங்கும் பல்துறைச் சிந்தனைகள்	விஜயா பதிப்பகம் கோவை.
18	டாக்டர் எம்.ஆர் விஜய்குமார்	பிரபஞ்ச ரகசியம்	ருக்மணி ஆப்செட் பிரஸ்
19	கா.கோ.வெங்கட்ராமன்	தமிழ் இலக்கிய வரலாறு	கலையக வெளியீடு, திண்டுக்கல்.
20	மது.ச.விமலானந்தம்	தமிழ் இலக்கிய வரலாறு	முல்லை நிலையம், சென்னை
21	மு.பரமசிவம்	நற்றமிழ் இலக்கணம்	சைவசித்தாந்த பதிப்பகம், திருநெல்வேலி.
22	வெங்கட்ராவ் பாலு	கடிதம் எழுதும் கலை	புதிய புத்தக உலகம்
23	முனைவர் கு.ஞானசம்பந்தன்	பேசும் கலை	விஜயா பதிப்பகம் கோவை.

SEMESTER II

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U2FRLT02	Title : French II	Batch	2019-2022
Hrs/week	5		Semester	1
			Credits	3

SYLLABUSPrescribed text: **LATITUDES I**

Units : 5 – 8

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New Delhi – 110007.

Tel : 011 – 23852986 / 9650597000

Question Paper Pattern**Semester II****Maximum Marks: 75****Time: 3 hrs.****(All questions to be set only from the prescribed text)****Section A (10)**

1. Choisissez la meilleure réponse: (10X1=10)

Section B (25)

2. Choisissez un des trois sujets et écrivez un texte d'environ 60 mots : (5X1=5)

3. Traduisez les textes suivants en anglais:(4/5) (4X5=20)

Section C (40)

4. Compréhension (5x1=5)

5. Exercices de grammaire:(5X5=25) **(either/or)**

6. Remplissez le dialogue:(5X1=5)

7. Associez :(5X1=5)

SEMESTER II

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U2HILT02	Title : Hindi II	Batch	2019-2022
			Semester	1
Hrs/week	5		Credits	3

SYLLABUS

1. MODERN POETRY : BHOOMIJA by NAGARJUN

Publishers

: Rajkamal Prakashan

1B Nethaji Subash Marg,

New Delhi.

2. ONE ACT PLAY : NAVEEN EKANKI SANGRAH

By Dr. Smt. MALATI THIVARI

SUMITHRA PRAKASHAN

ASHOK NAGAR

ALLAHABAD – 1.

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)

Ref : 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 :	19U2MLLT02	Title :Malayalam II	Batch	2019-2022
			Semester	1
Hrs/week	5		Credits	3

SYLLABUS

This paper will have the following five units:

Unit I & II

Autobiography

Unit III,IV & V

Travelogue

Text Books prescribed:

Unit I & II

Vazhithiruvukal-Dr.A.P.J.Abdulkalam

(D.C.Books, Kottayam)

Unit III,IV & V

Alkoottathil Thaniyae - M.T Vasudhevan Nair (D.C.Books, Kottayam)

Reference books:

1. Athmakathasahithyam Malayalathil-Dr.Vijayalam Jayakumar (N.B.S.Kottayam)
2. 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:	19U2ENLT02	Language II-Functional English – II	Batch	2019-2022
			Semester	II
Hrs/ Week	5 Hrs		Credits	3

COURSE OBJECTIVES:

To enable the students

- To understand the basic grammar in English.
- To acquaint students with the structure and strategies of conversation
- To make the students appreciate the significant works and style of prose
- To develop the skills of speaking and writing without flaws.
- To develop an interest in the minds of the students to enjoy and appreciate the literary works in English.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	Speak and Write without committing grammatical errors.
CO2	Read and appreciate simple literary works.
CO3	Deal with various conversational situations with confidence.

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12
CO1	-	-	-	-	-	-	-	-	-	✓	✓	✓
CO2	✓	-	-	-	-	-	-	-	-	-	✓	✓
CO3	-	-	✓	-	-	-	-	-	-	-	✓	✓

SYLLABUS**UNIT –I-POETRY****(Hours-12)**

- 1.La Belle Dame Sans Merci - John Keats
- 2.The Ballad of Father Gilligan – William Butler Yeats
- 3.The Daffodils - William Wordsworth

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

1. At School - Gandhi
2. My lost Dollar - Stephen Butler Leacock
3. On The Rule of The Road- A.G. Gardiner

UNIT- III- ONE – ACT PLAY **(Hours-12)**

1. A Meeting in a Forest - G. B. Shaw
2. The Dear Departed - Stanley Houghton

UNIT-IV-GRAMMAR AND COMPOSITION **(Hours-12)**

1. Sentence Structure
2. Wh- Questions
3. Question Tag
4. Advertisement
5. Hints Development

UNIT- V- DIALOGUE WRITING (CONVERSATION EXERCISES) **(Hours-12)**

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
3.	Adibah Amin, Rosemary Eravelly, Farida J Ibrahim	Grammar Builder Level Volume 1	Cambridge University Press

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

SEMESTER II

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U2MCCT03	Title : Core 3 - Analytical Geometry of Three Dimensions	Batch	2019-2022
			Semester	II
Hrs/week	4 Hrs		Credits	3

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.
- To understand the concepts of cylinder and how to determine the equation of cylinder.
- To know about the concepts of tangent and normal planes to the conicoids.

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 between 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 equation of tangent plane and normal.
CO4	Determine the equation of a cylinder 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****(10 Hrs)**

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**(10 Hrs)**

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**(10 Hrs)**

Cone – Definition – Right Circular Cone – Definition – Derivation of Right circular cone- Intersection of a straight line and a quadric cone - Tangent plane and normal - Condition 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**(10 Hrs)**

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**(10 Hrs)**

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.M. 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

- <https://www.scribd.com/document/29931462/3D-Analytical-Geometry>
- 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 :	19U2MCCT04	Title : Core 4 - Programming in C	Batch	2019-2022
			Semester	II
Hrs/week	4 Hrs.		Credits	3

COURSE OBJECTIVES

To enable the students

- To know about the basics of C Programming and its various computation logics.
- To understand the concept of operators.
- 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.
- To learn about the user defined function.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Recognize 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	Understand advanced use of arrays in C++ programming.
CO5	Sketch user defined functions and class for user specified actions.

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****(10 Hrs)**

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 Hrs)**

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 Hrs)**

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 Hrs)**

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 Hrs)**

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

- <https://www.geeksforgeeks.org/c-language-set-1-introduction/>
- <https://www.programiz.com/c-programming>
- https://en.wikipedia.org/wiki/C_%28programming_language%29
- <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 :	19U2MCCP05	Title : Core 5- Programming in C- Practical	Batch	2019-2022
			Semester	II
Hrs/week	3 Hrs.		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.
- To gain the knowledge of string functions.

COURSE OUTCOMES (CO)

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

CO Number	Statement
CO1	Understand the basic structure of C programming for declaring and usage of variables.
CO2	Find a solution for given problem by using time and memory complexity.
CO3	Solve given problem by using the loop and decision making statements.
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 :	19U2MCAT02	Title : Allied 2 - Mathematical Statistics - II	Batch	2019-2022
			Semester	II
Hrs/week	5 Hrs.		Credits	4

COURSE OBJECTIVES

To enable the students

- To understand the concept of population and samples.
- To know about concept of estimation, characteristics of estimation and method of estimation.
- To learn about test of significance.
- To understand the various methods of sampling and the concept of test of significance.
- 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****(12 Hrs)**

Concept of population, sample, statistics, parameter-point estimation-concept of point estimation - consistency, unbiasedness, efficiency-sufficiency-Neyman factorization theorem- Cramer Rao inequality -Rao-Blackwell theorem.

UNIT II**(12 Hrs)**

Methods of estimation-maximum likelihood, moments, and minimum chi-square – properties- interval estimation –confidence interval-derivation of confidence intervals based normal, t, and chi-square and F.

UNIT III**(12 Hrs)**

Test of hypothesis: Type-I error and II errors-power test –Neyman-Pearson Lemma-likelihood ratio tests-concept of most powerful test (statements and results only). Test of significance-standard error-large sample tests with respect to mean, standard deviation, proportion, difference between means, standard deviations and proportions-exact tests based on t, chi-square and F distributions.

UNIT IV**(12 Hrs)**

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**(12 Hrs)**

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	R.S.N. Pillai, V Bagavathi	Statistics	S. Chand and Co
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	Gupta, S.C. & Kapoor. V.K	Elements of Mathematical Statistics	Sultan Chand & Sons

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:	19U2VBET02	Value Based Education 2: Yoga for Youth Empowerment	Batch	2019-2022
			Semester	I
Hrs/ Week	2 Hrs		Credits	4

COURSE OBJECTIVES

- To Provide the value Education and improve the students good character
- To understand the yogic life and physical health
- To maintain youthfulness and moderation in five aspects of life
- To enable the students concentration and personality development
- To understand the law of nature and yogasanas

SYLLABUS

UNIT I

(5 Hrs)

Philosophy of life science

Life – purpose of life – philosophy of life – Law of Nature – Kindness towards living belongs preserving Naturals Resources.

அலகு 1: வாழ்வியல் தத்துவம்

வாழ்க்கை - வாழ்வின் நோக்கம் -வாழ்க்கைத் தத்துவம் -இயற்கை நியதி -பிற உயிர் பேணல் -இயற்கை வளம் காத்தல்

UNIT II

(5 Hrs)

Human values

culture – Analysis of Thought – Moralization of Desire – Neutralization of Anger – Eradication of worry – Blessings and Benefits – Harmonious Friendship – Love and Compassion – Individuals peace.

அலகு 2: தனிமனித பண்புகள்

பண்பாடு -எண்ணம் ஆராய்தல் -ஆசை சீரமைத்தல் -சினம் தவிர்ந்தல் -கவலை ஒழித்தல் -வாழ்த்தும் பயனும - நட்பு நலம் - அன்பும் கருணையும் - தனிமனித அமைதி.

UNIT III

(5 Hrs)

Social Values

Family – family peace – Society – Life Style – vworld Brotherhood – Greatness of women – Five Duties – Economics – Hygiene and Health Care – Education – politics – Responsibilities.

அலகு 3: சமுதாய மதிப்புகள்

குடும்பம் - குடும்ப அமைதி - சமுதாயம் - வாழ்க்கை முறை - உலக சகோதரத்துவம் -

பெண்ணின் -பெருமை - ஐவகைக் கடமைகள் -பொருளாதாரம் -சுகாதாரம் -கல்வி -அரசியல் -மக்களின் பொறுப்பு -உலக அமைதி

UNIT IV

(5 Hrs)

Development of Mental Prosperity

Prosperity of Mind – Life force – Bio-magnetism and mind – Functions of mind mental frequency – Ten stages of mind – genetic centre – Meditation – value of spirituality – universal Magnetism and Bio- Magnetism.

அலகு 4 : மனிதவள மேம்பாடு

மனவளம் - உயிரும் மனமும் - உயிரின் இயக்க மையம் - மனத்தின் செயல்கள் - மன அலைச்சுழல் - மன இயக்கப் படி நிலைகள் - கருமையம் - தவம்(தியானம்) - ஆன்மீக மதிப்பு - வான்காந்தம் - சிவகாந்தம்

UNIT V

(5 Hrs)

Maintenance of physical Health

Structure of Human Body – Three Functional Bodies – Harmony between Body and Life Force – Pain, Diseases and Death – Reasons for Disease – Limit and Method in Five Factors – Simplified physical Exercises – Practice for simplified Physical Exercises.

அலகு 5 :உடல் நலம் பேணல் உடலமைப்பு உடலின் மூவகை இயக்க மையங்கள் உடலுக்கும் உயிருக்குமான உறவு நோய்க்கான காரணங்கள் ஐந்தில் அளவு முறை எளியமுறை உடற்பயிற்சி யோகாசனங்கள் கதிரவன் வணக்கம் தண்டாசனம் சக்கராசனம் பக்கவாட்டில் விருச்சாசனம் ஏகபாத ஆசனம் திரிகோணாசனம் வஜ்ராசனம் பத்மாசனம் யோக முத்ரா மகா முத்ரா உஸ்டராசனம் வக்ராசனம் சவாசனம்

TEXT BOOKS:

Recent editions of the following books only are recommended

S. No.	Author Name	Title of the Book	Publisher
1.	Vethathiri Maharishi	Journey of Consciousness	Vethathiri Publications, Erode
2.	Vethathiri Maharishi	Simplified Physical Exercises	Vethathiri Publications, Erode
3.	Vethathiri Maharishi	Unified Force	Vethathiri Publications, Erode
4.	Thathuvagnani Vethathiri Maharishi	Yoga for Modern Age	-
5.	Dr.Chandrasekaran	Sound Health Through Yoga	Prem Kalyan Publications, Madurai

SEMESTER II

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19UVBET03	Title :Value Education 3 (அறவியலும் பண்பாடும்)	Batch	2019-2022
Hrs/week	2		Semester	1
			Credits	1

அறவியலும் பண்பாடும் - (தனிமனித விழுமியங்கள்இ குடும்ப விழுமியங்கள், சமுதாய விழுமியங்கள், பணிசார்ந்த விழுமியங்கள், தேசிய விழுமியங்கள், உலகளாவிய விழுமியங்கள்)

நோக்கம்

- ஒவ்வொருவரும் தன்னை உயர்த்திக் கொண்டுஇ சமுதாய மக்களுடன் இணக்கமாக வாழ்ந்து சமுதாயத்தை உயர்த்த வேண்டும். உன்னத இலட்சியத்திற்காக தமது வாழ்க்கையை அர்த்தமுள்ளதாக ஆக்கிக் கொள்ள வேண்டும்.
- குடும்ப அமைதி, ஐந்தொழுக்கப் பண்பாடு, உணவே மருந்து, ஆளுமைப்பண்பு, தலைமைப்பண்பை மாணவர்களிடம் உருவாக்குதல்.
- உலக நாடுகளுடன் ஒற்றுமை, புரிந்துணர்வு ஆகியவற்றின் மூலம் இந்தியாவின் வலிமையை உணரச்செய்தல்.
- வளர்ந்துவரும் இந்தியா, உலகிற்கு வழங்கும் செய்தி, வேற்றுமையில் ஒற்றுமை, இந்தியாவும் ஆன்மீகமும், பற்றி மாணவர்களை உணரச்செய்தல்.

பாடப்பகுதி கற்றலின் வெளிப்பாடு - Course Outcome (CO)

CO Number	CO Statement
CO1	தன்னை, உள்நோக்க அறிவால் ஆராய்ந்து தன்னிடமுள்ள உணர்ச்சி வயப்பட்டு குணங்களை எல்லாம் மாற்றியமைத்துக் கொள்ளச் செய்தல்.
CO2	குடும்ப அமைதி, ஐந்தொழுக்கப் பண்பாட்டை அறிந்து, அதன்படி வாழ்ந்து தன்னை உயர்த்திக் கொள்ளச் செய்தல்.
CO3	வாழ்க்கையின் இலக்கை அடையத் தேவையான தகுதியை வளர்த்துக் கொள்ளல்.
CO4	பிற நாடுகளோடு இந்தியா கொண்டுள்ள தொடர்பின் மூலம் நமது நாட்டினுடைய கலாச்சாரம், பண்பாட்டினை உணரச்செய்தல்.
CO5	வளர்ந்துவரும் இந்தியா, உலகிற்கு வழங்கும் செய்தி, வேற்றுமையில் ஒற்றுமை, இந்தியாவும் ஆன்மீகமும் பற்றி மாணவர்களை உணரச்செய்தல்.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்

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

பாடத்திட்டம்

அலகு - 1

6 மணி நேரம்

- மனித வள மாண்பின் அவசியம் - மனித வாழ்வின் நோக்கமும் தத்துவமும் - தன்னிலை அறிதல் - வாழ்த்தும் பயனும் - அன்பும் கருணையும்

அலகு - 2

6 மணி நேரம்

- குடும்ப அமைதி - இல்லறமே நல்லறம் - ஐந்தொழுக்கப் பண்பாடு - பாலுணர்வும் ஆன்மீக மேம்பாடும் - உணவே மருந்து .

அலகு - 3

6 மணி நேரம்

- ஆளுமை மேம்பாட்டுக் கூறுகள் - சுயமுன்னேற்றமும் தலைமைப் பண்பும் மனித வேறுபாட்டிற்கான காரணங்கள் - மனத்தூய்மை தரும் சமுதாய நலன் .

அலகு - 4

6 மணி நேரம்

- செம்மாந்த குடியரிமை - வளர்ந்து வரும் இந்தியா - வெளிநாட்டவர் பார்வையில் இந்தியா - இந்திய கலாச்சாரத்தின் மேன்மை

அலகு - 5

6 மணி நேரம்

- இந்தியா உலகிற்கு வழங்கும் செய்தி - வேற்றுமையில் ஒற்றுமை - இந்தியாவும் ஆன்மீகமும் - கலாச்சார சீரழிவும் தீர்வு - செயலும் மனிதனே தீர்வு மனிதனே .

பாட நூல் - தொகுப்பு தமிழ்த்துறை வெளியீடு 2019.

பார்வை நூல்கள்

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.
3	-	குடும்ப விழுமியங்கள்	என்.ஜி.எம். கல்லூரி, பொள்ளாச்சி.
4	-	உலகலாவிய விழுமியங்கள்	என்.ஜி.எம். கல்லூரி, பொள்ளாச்சி.
5	-	பணிசார்ந்த விழுமியங்கள்	என்.ஜி.எம். கல்லூரி, பொள்ளாச்சி.
6	-	தேசிய விழுமியங்கள்	என்.ஜி.எம். கல்லூரி, பொள்ளாச்சி.

SEMESTER II

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U2SBST03	Skill Based Subject 3 - Title : Mathematics for Competitive Examinations –II	Batch	2018-2021
Hrs/week	2 Hours		Semester	II
			Credits	1

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 (CO)

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

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****(5 Hrs)**

Profit and Loss – Ratio and Proportion

UNIT II**(5 Hrs)**

Partnership – Chain Rule

UNIT III **(5 Hrs)**

Time and Distance – Time and work

UNIT IV **(5 Hrs)**

Permutation & Combinations

UNIT V **(5 Hrs)**

True Discount- Bankers Discount

(Simple Problems only)

TEXT BOOKS

S. No	Author Name	Title of the Book	Publisher	Year / Edition
1	R. S. Agarwal	Quantitative Aptitude (for Competitive Examinations)	S. Chand and Company Limited	7 th Revised Edition -2007

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher	Year / Edition
1	R.V.Praveen	Quantitative Aptitude and Resoning	PHI Learning pvt. Ltd	2012
2	Abhijit Guha	Quantitative Aptitude for Competitive Examinations	ata Mc-Graw Hill Publishing Company	7 th reprint-2003

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:	19U2SBST04	Skill Based Subject 4 - Communication Skills- II	Batch	2019-2022
			Semester	II
Hrs/ Week	2 Hrs		Credits	1

COURSE OBJECTIVES:

- To make the students to understand the barriers in their communication and the ways to over come the same.
- To make the students to know various types of listening and the effect of enhancing the listening skills
- 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 the 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 listening and be a careful listener
CO3	To deal with different kinds of situations by conversing effectively and maintaining the etiquette required for such situations

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT –I**

1. Parts of Speech
2. Tenses

3. Active voice and passive voice

4. Phrasal Verbs

UNIT- II

1. Confusable Words

2. Jumbled Sentences

3. Synonyms

4. Antonyms

UNIT- III

Reading Techniques (Skimming and Scanning)

Types of Reading - Intensive Reading and Extensive Reading

Brain Storming

Role Play

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	Technical English – II	Vijay Nicole Imprints Pvt.Ltd.

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

SEMESTER III

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U3MCCT06	Title : Core 6 : Vector Calculus & Fourier Series	Batch	2019-2022
Hours/week	6 Hours		Semester	III
			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 differentiation 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****(15 Hours)**

Definition of ∇ , $\nabla\phi$ – level surfaces-angle between level surfaces-Equation of normal line

and tangent plane-Definition of divergence f -solenoidal vector-problems-Definition of curl
F-irrotational vectors,related problems.

UNIT II **(15 Hours)**

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

UNIT III **(15 Hours)**

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

UNIT IV **(15 Hours)**

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

UNIT V **(15 Hours)**

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

TEXT BOOK

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	Dr.P.R.Vittal,V.Malini & R.V.Praveen	Vector Analysis	Margham Publications	2004
2	S.Narayanan,T.K.Manic kavachagom Pillai	Calculus volume-III (Differential Equations &Fourier Series and Fourier Transforms)	Viswanathan Printers	2008

REFERENCE BOOK

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	P.Kandasamy, K.Thilagavathy	Mathematics, Volume IV(Vector calculus,Fourier series)	S.Chand&Company	2009
2	P.DuraiPandian and KayalalPachaiyappa	Vector Analysis	S Chand Publications	2018
3	Shanthinarayan and P.K Mital	Vector Calculus	S Chand Publications	2016

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 :	19U3MCCT07	Title : Core 7 :Statics	Batch	2019-2022
Hours/week	6 Hours		Semester	III
			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 principles 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)

Varignon'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

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	M.K.Venkataraman	Statics	Agasthiar Publications Trichy	2018

REFERENCE BOOK

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	A.V.Dharmapadam	Statics	S.Viswanathan printers and Publishing Ltd	2013
2	Loney.S.L	The Elementary of Statics and Dynamics (Part I Statics)	Arihant Prakashan	2015

WEBSITE REFERENCE

1.<http://phycis.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 :	19U3MCCT08	Title : Core 8: Programming in C++	Batch	2019-2022
Hours/week	6 Hours		Semester	III
			Credits	4

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++
CO2	Explain functions & operations in C++
CO3	Define classes, objects, constructors & destructors
CO4	Apply the operator overloading & inheritance concept
CO5	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:****(15 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:**(15 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:**(15 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:**(15 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:**(15 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

S. No	Author Name	Title of the Book	Publisher	Year / Edition
1	E.Balagurusamy	Object Oriented programming with C++	McGraw Hill Publications	5 th Edition, 2011
2	Robert Lafore	Object oriented programming in Turbo C++	Galgotia publications pvt.Ltd, New Delhi	2007
3	Bjarne Stroutstrup	The C++ programming language	Addision Wesley	4 th Edition, 2004

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher	Year / Edition
1	D.Ravi Chandran	Programming with C++	Tata McGraw-Hill publishing company limited	3 rd Edition, 2011
2	Ashok N.Kamthane	Object Oriented Programming with ANSI and Turbo C++	Pearson Education Publishres	1 st Edition, 2006
3	John R.Hubbard	Programming with C++	TMH publishers	2 nd Edition,2000

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 :	19U3MCCP09	Title : Core 9: Programming in C++(Practical)	Batch	2019-2022
Hours/week	3 Hours		Semester	III
			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
CO2	Apply member function to calculate employee payslip
CO3	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 :	19U3MCAT03	Title :Allied 3: Accountancy-I	Batch	2019-2022
Hours/week	6 Hours		Semester	III
			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
CO2	Prepare a Final accounts of Sole Trader concern.
CO3	Prepare accounting for of Non-Trading Concerns.
CO4	Explain the concept of Joint Venture and Consignments
CO5	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

S. No	Author Name	Title of the Book	Publisher	Year / Edition
1	T. S. Reddy & A. Murthy	Financial Accounting	Margham Publication, Chennai	2012
2	K.L. Nagarajan, N. Vinayakam, P.L. Nagarajan	Principles of Accountancy	S.Chand& Company Limited	2010

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher	Year / Edition
1	T.S. Grewal	Introduction to Accountancy	S.Chand & Company Limited	2010
2	Jain & Narange	Advanced Accountancy	Kalyani publishers	2011
3	R.S.N. Pillai & Bhagavathy	Introduction to Accountancy	S.Chand & Company Limited	2010

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 :	19U3SBST05	Skill based subject 5: Mathematics for competitive Examinations III	Batch	2019-2022
Hours/week	2 Hours		Semester	III
			Credits	1

COURSE OBJECTIVES

To enable the Students

- To make the students to know the concept of Pipes, Cistern and Probability.
- 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 – Probability

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

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	R. S. Agarwal	Quantitative Aptitude (for Competitive Examinations)	S. Chand and Company Limited	2017

REFERENCE BOOKS

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	R.V.Praveen	Quantitative Aptitude and Reasoning,	PHI Learning pvt. Ltd	2012
2	Abhijit Guha	Quantitative Aptitude for Competitive Examinations	Tata Mc-Graw Hill Publishing Company	2019

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:	19U3SBST06	Skill based subject 6: Communication Skills- III	Batch	2019-2022
Hrs/ Week	2 Hrs		Semester	III
			Credits	1

COURSE OBJECTIVES:

- To make the students to understand the barriers in their communication and the ways to overcome the same
- To make the students to know various types of listening and the effect of enhancing the listening skills
- 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 the students will 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 listening 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

- Verbal and Non-Verbal Communication
- Barriers to Communication

UNIT- II- LISTENING SKILLS

- Types of Listening
- Tips for Effective Listening
- Traits of Good Listening

UNIT- III- SPEAKING

- Group Discussion
- Speaking at Different Types of Interviews
- Making Effective Telephone Calls
- Telephone Etiquette

TEXT BOOKS:

S. No	Author Name	Title of the Book	Publisher	Year/Edition
1	Meenakshi Raman	Communication Skills	Oxford University Press	2011
2	Shalini Aggarwal	Essential Communication Skills	Ane Books Pvt.Ltd. New Delhi	2011

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher	Year/Edition
1	Course team, Bharathiyar University	Communication Skills a multi- skill course	Macmillan Publishers India LTD.	2009
2	Krishna Mohan	Developing Communication Skills	Macmillan Publishers India LTD.	2018
3	Joyce Pereire	Technical English – II	Vijay Nicole Imprints Pvt.Ltd.	2017

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

SEMESTER : III

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U3NMET01	Non Major Elective 1 : Food Science and Nutrition	Batch	2019-2022
Hrs/week	2 Hrs		Semester	III
			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 will 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

Unit	Content
Unit-I	(6 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	(6 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	(6 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 and sources, requirement, deficiency and excess of the following. Calcium, Phosphorus, Iron and Iodine. FIBRE- definition, types, sources, functions, importance in disease prevention
Unit-IV	(6 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	(6 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:

S. No	Author Name	Title of the Book	Publisher
1	<u>Dr.A.Indhuleka</u>	<u>Healthy Vittles and Bits</u>	

REFERENCE BOOKS:

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

Means of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Google Classroom

SEMESTER III

Programme Code :	12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U3NCCT01	Title : அடிப்படைத் தமிழ்	Batch	2019-2022
			Semester	III
Hrs/week	-		Credits	-

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 எனவை 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, உயிர்மெய் 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.

SEMESTER III

Programme Code :	12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U3NCCT01	Title : சிறப்புத் தமிழ்	Batch	2019-2022
			Semester	III
Hrs/week	-		Credits	-

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.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்

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

பாடத்திட்டம்

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 - III

Programme Code :	B.Sc. Mathematics (CA)	Programme Title:	Bachelor of Science Mathematics (CA)	
Course Code:	19U3SSCT01	Self Study Course 1: மனித வாழ்க்கையும் காந்தியடிகளும்	Batch	2019 - 2022
Hrs/ Week	-		Semester	3
			Credits	1

நோக்கம்

1. மானிட வாழ்வில் பின்பற்ற வேண்டிய நடைமுறைச் செயல்பாடுகளை உணர்த்துதல்.
2. இன்றைய நவீன வாழ்க்கைச் சூழலில் ஏற்படும் சிக்கல்கள், பிரச்சனைகளை காந்திய தீர்வுகளை அறியச் செய்தல்.
3. மகாத்மாவின் வாழ்க்கை முறை, கல்வி, வாழ்வு பற்றிய கருத்துக்களை கற்று உணர்தல்.
4. நடைமுறை வாழ்வில் அகிம்சையைப் பின்பற்றுவதால் ஏற்படும் நன்மைகளைப் புரிந்து கொள்ளச் செய்தல்.
5. காந்தியடிகள் இந்திய விடுதலைக்காகப் பின்பற்றிய கொள்கைகளை மாணவர்கள் கற்று அறிதல்.

பாடப்பகுதி கற்றலின் வெளிப்பாடு - Course Outcome (CO)

CO Number	CO Statement
CO1	மானிட பிறப்பின் நோக்கம், வாழ்க்கை இரகசியம், தன்னலம் இல்லா வாழ்க்கை, இல்வாழ்க்கையின் சிறப்பு, உடலைப் பாதுகாத்தல் ஆகியவற்றை புரிந்து கொள்ளல்.
CO2	வாய்மையினால் இணைந்த மெய்யறிவு, இயற்கையுடன் இணைந்த மெய்யறிவு, சத்தியாகிரகிகளாக ஆத்ம சக்தியுடன் வாழ்ந்த பெரியோர்களின் வாழ்வை உணர்ந்து அவர்கள் வழியில் வாழ முயற்சித்தல்.
CO3	காந்தியடிகள் வாழ்க்கை மூலம் கல்வி, இல்லறம், பெற்றோரைப் பேணல், தியாகம், இயற்கை வாழ்வு, செல்வம், உண்மை, அஞ்சாமை மாணவர்கள் அறிதல்.
CO4	இயற்கையின் நோக்கம், அகிம்சையை பின்பற்றுதல், ஊன் உண்ணாமை, தீண்டாமை, சுயராஜ்யத்தின் தன்மைகள், மக்களின் வாழ்க்கையில் சுதேசியம், சுதேசிய உரிமை, காந்தியடிகளின் வாழ்க்கை மூலம் மாணவர்கள் அறிதல்.
CO5	சத்தியாகிரகம் விளக்கம், காந்தியும் சத்தியாகிரகமும், காந்தியும் தென்னாப்பிரிக்கப் பயணம், ரௌலட் சட்டம், காந்தியின் சிறை வாழ்வு, சமய வாழ்வு, சமரச சன்மார்கம், சமரச வாழ்வின் பயன் போன்றவற்றை மாணவர்கள் அறிதல்.

MAPPING WITH PROGRAMME OUTCOMES

CO /PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	-	✓	-
CO2	-	-	-	-	-	-	-	-	-	✓	✓	-
CO3	-	-	-	-	-	-	-	✓	-	-	✓	-
CO4	-	-	-	-	-	-	-	✓	-	-	✓	-
CO 5	✓	-	-	-	-	-	-	✓	-	-	✓	-

பாடத்திட்டம் : மனித வாழ்க்கையும் காந்தியடிகளும்

அலகு 1 பக்க எண் (1 – 40)

மனிதன் - மனிதப் பிறவியின் விழுப்பம் - மக்கள் - மனிதன் எவன் - வாழ்க்கை - கீதா ரகசியம் - கருத்து வேற்றுமை - உரை கண்டவர் - போர்களத்தில் இல்லறத்தானுக்கு அறிவுறுத்தல் - பயன் கருதா அருளறம் - அருச்சுணன் தெளிவு - இரு பிறப்பு - இல்லற நோக்கம் - திருக்குறள் நுட்பம் - இல்லற மாண்பு - அருளறம் - நாட்டு அறநூல்கள் - சில முறைகள் உடலோம்பல் - ஞானிகள் நோக்கம் - உடம்பின் அருமை.

அலகு 2 பக்க எண் (41 – 73)

வாய்மை - வாய்மையில் பிற அறங்கள் - வாய்மை உயிர் மெய்யறிவு - விலங்கும் மனிதனும் - இயல்பு - மனச்சான்று - இயற்கை வாழ்வில் மெய்யறிவு - பொறுமை - நான்கு குணங்கள் - அடக்கம் - உள்ளறிறை - உண்மை - பொறுமை - பொறாமை ஆன்ம சக்தி - உள் ஒளி - ஆத்ம சக்தி - ஆத்ம சக்தியும் பூத சக்தியும் - சத்யாகிரகம் - இயல்பு - துராக்கிரகம் - அச்சுறுத்தல் - தியாகம் - சத்யாகிரகிகள் - ஊடல் - மார்க்கண்டேயர் - பிரகலாதன் - அரிச்சந்திரன் - வசிஷ்டன் - புத்தர் - ஸோகர்தர் - கிருஸ்து - முகம்மது - கீதை - சாவித்திரி - திருநாவுக்கரசர் - மெய்பொருள் -

பிரான்சிஸ் முனிவர் - தால்தாய் - தோரி - முதலியோர் - இயற்கையறம் சத்தியாகிரகம், சாதுநிலை - சாது எவன்.

அலகு 3 பக்க எண் (75 - 200)

காந்தியடிகள் - பொருள் - மகாத்மா - மகான் - சில அடி கண்மார் புது உலகம் - காரல் மார்க்ஸ் - சிறியவுடலில் பெரிய ஒளி - பிறப்பு - கல்வி - பெற்றோர்ப் பேணல் - இல்லறம் - தியாகம் - இயற்கை வாழ்வு - செல்வம் நல்குரவு - வாழ்க்கைக் கூறுகள் - கிறிஸ்து மொழிகள் - உண்மையும் அஞ்சாமையும் - அடிகளின் அஞ்சா வினைகள் - மெய்யறிவு.

அலகு 4 பக்க எண் (200 - 257)

அஷிம்சை - அஷிம்சையும் சமயமும் - ஊன் எண்ணாமை - தீண்டாமை - இயற்கை அறம் அஷிம்சை - நவகாளி நிகழ்ச்சி - மார்க்ஸியம் - சுயராஜ்யமும் சுதேசியமும் - பன்மையில் ஒருமை - பாரத மக்களும் சுதேசியமும் - சுதேசியமும் உரிமையும் - சுயராஜ்யம் கடவுள் படைப்பு நோக்கம் - சாதி சமயப்போர் - நாட்டுத்தொண்டு.

அலகு 5 பக்க எண் (257 - 364)

பொருள் - காலம் தோற்றம் - சத விளக்கம் - சத்யாக்கிரகியார் - குறைபாடுகள் - உயிர் உடல் வாழ்வு - சத்யாகிரகமும் அடிகளும் - கூர்ஜரப் பாட்டு - தென்னாப்பிரிக்கா - சாம்யராண் - செய்தா - ரௌலட் சட்டம் - சத்யாகிரக நாள் - சட்டமும் அறமும் - சட்ட வரம்பு - சிறைப்பாடுபாடுகள் - சமயவாழ்வு - உண்மை மனிதன் - முழுமுதற் பொருளுண்மை - அஷிம்சையே சமயம் - சமயப்போர் - சமய வாழ்வின் இயல்பு - அடிகள் சமயம் சமரச சன்மார்க்கம் - சாதுநிலை - சமய வாழ்வின் பயன் சாதுநிலை - சாதுக்களால் உலகம் நடைபெறல் - பிறர்க்குரிய வாழ்வு - பெரியோர் வருகை - அடிகள் வாழ்வு நூலின் பெரும் பிரிவுகள் - அடிகள் அறவுரைச் சுருக்கம் - இன்பப்பேறு - வாழ்த்து.

பாடநூல்

வ. எண்	ஆசிரியர் பெயர்	நூலின் பெயர்	வெளியீடு	ஆண்டு - பதிப்பு
1	திரு. வி. கலியாணசுந்தரனார்	மனித வாழ்க்கையும் காந்தியடிகளும்	பூம்புகார் பதிப்பகம் சென்னை - 600013	ஏப்ரல் - 2004

பார்வை நூல்

வ. எண்	ஆசிரியர் பெயர்	நூலின் பெயர்	வெளியீடு	ஆண்டு - பதிப்பு
1	மோகன்தாசு கரம்சந்த் காந்தி (தமிழாக்கம் - ரா. வேங்கடராஜலு)	மகாத்மா காந்தியின் சுய சரிதை	நவஜீவன் பிரசுராலயம் அகமதாபாத் 380014	ஜூலை - 2000
2	தொகுப்பு - பேராசிரியர் முனைவர் மா.ரா.போ. குருசாமி	முகாத்மா நூல்கள் (காந்தி முன்னோடிகள்)	வர்த்தமானர் பதிப்பகம் -சென்னை - 17	2005
3	மோகன்தாசு கரம்சந்த் காந்தி (தமிழாக்கம் - ஆவினாசிலிங்கம்)	முகாத்மா நூல்கள் (தென்னாப்பிரிக்காவில் சத்தியாகிரகம்)	வர்த்தமானர் பதிப்பகம் -சென்னை - 17	2005

SEMESTER IV

Programme Code :	B.Sc. Mathematics (CA)	Programme Title:	Bachelor of Science Mathematics (CA)	
Course Code :	19U4MCCT10	Title : Core 10: Differential Equations & Laplace transforms	Batch	2019-2022
Hours/week	7 Hours		Semester	IV
			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 functions.
- 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 arbitrary constants and arbitrary 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)**

Linear equations with constant coefficients - Linear equations with variable coefficients – Equations reducible to the linear homogeneous equation (reducible to Q form). 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 $e^{mx}, \cos mx, \sin mx, x, x^2, x e^{mx}, x \sin mx, x^2 \sin mx, e^{mx} \sin nx, e^{mx} \cos nx$.

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 theorem.

UNIT V**(17 Hours)**

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

TEXT BOOK

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	S. Narayanan & T.K Manickavachagom Pillai	Calculus Volume III	S. Viswanathan (Printers and Publishers) Pvt. Ltd.	Revised 18th edition, 2010
2	Kandasamy.P, Thilagavathi.K	Mathematics for B.Sc- Branch-I volume-III	S.Chand&Co	2004

REFERENCE BOOK

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	N.P.Bali	Differential equations	Laxmi Publications	2004
2	Dr.M.K.Venkataraman, Mrs.Manorama Sridhar	Differential Equations and Laplace Transforms,	The National Publishing Co	2004

WEBSITE REFERENCE

1.<http://www.vyssotski.ch>

2.[http:// math.stackexchange.com](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 :	19U4MCCT11	Title : Core 11:Dynamics	Batch	2019-2022
Hours/week	6 Hours		Semester	IV
			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:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	M.K .Venkataraman	Dynamics	Agasthiar Publications Trichy	2014

Reference Book

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	N.P. Bali	Dynamics	Laxmi Publications	2011
2	K.Viswanatha Naik and M.S.Kasi	Dynamics	Emerald publishers,New	2008

WEBSITE REFERENCE

1.[http:// firebase.google.com](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 :	19U4MCCT12	Title : Core 12: Data Structure using C++	Batch	2019-2022
			Semester	IV
Hours/week	5 Hours		Credits	4

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 Arrays, 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

S. No	Author Name	Title of the Book	Publisher	Year / Edition
1	E.Horowitz and S.Shani	Fundamentals of Data Structures in C++	Galgotia publication	2008

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher	Year / Edition
1	R.Kruse C.L. Tondo and B.Leung	Data Structures and Program design in C	PHI	2006
2	Cangsam, Aug uenstein, Tenenbaum	Data Structures using C & C++	PHI	2019
3	D.Samantha	Classic Data Structures	PHI, New Delhi	2015

WEBSITE REFERENCEwww.tutorialspoint.comwww.includehelp.comwww.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 :	19U4MCCP13	Title : Core 13: Data structure using C++ (Practical)	Batch	2019-2022
			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
CO2	Use heap sort and binary swatch
CO3	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 :	19U4MCAT04	Title :Allied 4: Accountancy-II	Batch	2019-2022
			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

S. No	Author Name	Title of the Book	Publisher	Year / Edition
1	T. S. Reddy & A. Murthy	Financial Accounting	Margham Publication, Chennai	2012
2	K.L. Nagarajan, N. Vinayakam, P.L. Nagarajan	Principles of Accountancy	S.Chand & Company Limited	2010

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher	Year / Edition
1	T.S. Grewal	Introduction to Accountancy	S.Chand & Company Limited	2010
2	Jain & Narange	Advanced Accountancy	Kalyani publishers	2011
3	R.S.N. Pillai & Bhagavathy	Introduction to Accountancy	S.Chand & Company Limited	2010

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 :	19U4SBST07	Skill Based Subject 7: Mathematics for Competitive Exmainations IV	Batch	2019-2022
Hours/week	2 Hours		Semester	IV
			Credits	1

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 -Logical 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

TEXT BOOK

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	R. S. Agarwal	Quantitative Aptitude (for Competitive Examinations)	S. Chand and Company Limited	2017

REFERENCE BOOKS

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	R.V.Praveen	Quantitative Aptitude and Reasoning,	PHI Learning pvt. Ltd	2012
2	Abhijit Guha	Quantitative Aptitude for Competitive Examinations	Tata Mc-Graw Hill Publishing Company	2019

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 Mathematics (CA)	
Course Code:	19U4SBST08	Skill Based Subject 8: Communication Skills- IV	Batch	2019-2022
Hrs/ Week	2 Hrs		Semester	IV
			Credits	1

COURSE OBJECTIVES:

- To know clearly the use of various symbols for pronouncing the words with proper sounds.
- To make aware of various techniques of reading and writing different reports.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students will be able to achieve the following outcomes.

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

SYLLABUS**UNIT-I : READING & WRITING**

- Resume Preparation
- Report Writing
- Minutes of a Meeting
- Data Representation and Interpretation
- Memos

UNIT- II : SOUNDS & SYMBOLS

- Vowels
- Consonants
- Diphthongs
- Stress and Intonation

TEXT BOOKS:

S.No	Author Name	Title of the Book	Publisher	Year/Edition
1	Meenakshi Raman	Communication Skills	Oxford University Press	2011
2	Shalini Aggarwal	Essential Communication Skills	Ane Books Pvt.Ltd. New Delhi	2011

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher	Year/Edition
1	Course team, Bharathiyar University	Communication Skills a multi- skill course	Macmillan Publishers India LTD.	2009
2	Krishna Mohan	Developing Communication Skills	Macmillan Publishers India LTD.	2018
3	Joyce Pereire	Technical English – II	Vijay Nicole Imprints Pvt.Ltd.	2017

Means of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Google Classroom

SEMESTER IV

Programme Code :	B.Sc Mathematics CA	Programme Title	Bachelor of Mathematics (CA)	
Course Code :	19U4NMET02	Non Major Elective 2 : Floriculture	Batch	2019-2022
Hrs/week	2 Hrs		Semester	IV
			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 propagate 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 will 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

Unit	Content
Unit-I	(6 Hours) Floriculture – Definition, Introduction and Scope of Floriculture. Status of floriculture in India. Development of Floriculture
Unit-II	(6 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	(6 Hours) Design- Types of design Flower choice for design, Corsages/Boutonnieres, Vase design, Basket/mug design.
Unit-IV	(6 Hours) Propagation-Types of propagation, Annuals & Perennials, Varieties, Growing seasons, Potting techniques.
Unit-V	(6 Hours) Careers in Floriculture. Export/Import and marketing in floriculture. Government Incentives and Schemes. The role of supporting agencies.

TEXT BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	<u>Dr.S.N.Suresh</u>	<u>Introduction to Floriculture</u>	

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher
1	<u>Jacob Varghese Kunthara</u>	<u>Know your Garden Plants</u>	
2	<u>Dr. B. Hemlanaik</u>	<u>Production Technology of Ornamental Crops and Landscape Gardening</u>	

Means of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Case Studies, Google Classroom.

SEMESTER IV

Programme Code :	12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு	Programme Title	Bachelor of Mathematics (CA)	
Course Code :	19U4NCCT02	Title : அடிப்படைத் தமிழ்	Batch	2019-2022
Hrs/week	-		Semester	IV
			Credits	-

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 வாழ்க்கை 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 “ஓளவியம் 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 - (தொனாலிராமன் 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.

SEMESTER IV

Programme Code :	12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு	Programme Title	Bachelor of Mathematics (CA)	
Course Code :	19U4NCCT02	Title : சிறப்புத் தமிழ்	Batch	2019-2022
Hrs/week	-		Semester	IV
			Credits	-

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.

நிரல் விளைவுகளைக் கொண்ட வரைபடம்

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

பாடத்திட்டம்

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- IV

Bachelor of Mathematics(CA)	Bachelor of Mathematics (CA)	Bachelor of Mathematics (CA)	Bachelor of Mathematics (CA)	
Course Code:	19U4SSCT02	Self Study Course 2 : Women's Rights	Batch	2019-2022
Hrs/ Week	-		Semester	IV
			Credits	1

COURSE OBJECTIVES:

- To make the women students understand the legal systems, constitutional frame work and human rights in India.
- To understand and appreciate the women's claims to land and their right to property.
- To make the women students to know fully about the laws enacted to protect women against violence, harassment sexual abuse and the loopholes in practice.
- To give a knowledge to the students about the various acts enacted relating to marriage validation, Hindu widow re- marriage, dowry prohibition, imortal traffic prevention, and women development and empowerment.

COURSE OUTCOMES (CO):

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

CO Number	CO Statement
CO1	Explain clearly about the legal systems costitutional frame work and human rights.
CO2	Tell about their claims to land and right to property.
CO3	To explain about the various laws and acts enacted for protection of women from various kinds of violence and abuse, and for validating their marriage
CO4	Explain various acts available for women development and empowerment.

UNIT I

Laws, Legal Systems and Change Definition - Constitutional law, CEDAW and International Human Rights – Laws and Norms – Laws and Social Context – Constitutional and Legal Framework.

UNIT II

Politics of land and gender in India Introduction – Faces of Poverty – Land as Productive Resources – Locating Identities – Women’s Claims to Land – Right to Property - Case Studies.

UNIT III

Women’s Rights: Access to Justice Introduction – Criminal Law – Crime Against Women – Domestic Violence – Dowry Related Harassment and Dowry Deaths – Molestation – Sexual Abuse and Rape – Loopholes in Practice – Law Enforcement Agency.

UNIT IV

Women’s Rights: Violence Against Women – Domestic Violence - The Protection of Women from Domestic Violence Act, 2005 - The Marriage Validation Act, 1982 - The Hindu Widow Re-marriage Act, 1856 - The Dowry Prohibition Act, 1961

UNIT V

Special Women Welfare Laws Sexual Harassment at Work Places – Rape and Indecent Representation – The Indecent Representation (Prohibition) Act, 1986 - Immoral Trafficking – The Immoral Traffic (Prevention) Act, 1956 - Acts Enacted for Women Development and Empowerment - Role of Rape Crisis Centers.

REFERENCE BOOKS:

S. No	Author Name	Title of the Book	Publisher	Year /Edition
1	Nitya Rao	Good Women do not Inherit Land	Social Science Press and Orient Blackswan	2008
2	Monica Chawla	Gender Justice	Deep and Deep Publications Pvt Ltd.	2006
3	<u>Preeti Mishra</u>	<u>Domestic Violence Against Women</u>	<u>Deep and Deep Publications Pvt Ltd.</u>	<u>2007</u>
4	P.D.Kaushik	Women Rights	Bookwell Publication	2007
5	Aruna Goal	Violence Protective Measures for Women Development and Empowerment	Deep and Deep Publications Pvt	2004

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

SEMESTER V

Programme Code :	B.Sc. Mathematics (CA)	Programme Title:	Bachelor of Science Mathematics (CA)	
Course Code :	19U5MCCT14	Title : Core 14: Real Analysis	Batch	2019-2022
Hrs/week	6 Hours		Semester	V
			Credits	4

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	-	✓	✓	✓	-	✓	-	-	-	-	-	-

UNIT I**(15 HRS)**

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 theorem - the Cantor intersection Theorem.

UNIT II**(15 HRS)**

Covering – Lindelof covering theorem – the Heine Borel covering theorem – Compactness in R^n -

Metric Spaces – Point set topology in metric spaces – compact subsets of a metric space – Boundary of a set.

UNIT III**(15 HRS)**

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 Theorem.

UNIT IV**(15 HRS)**

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**(15 HRS)**

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.louisville.edu

2.<http://math.stackexchange.com>

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

SEMESTER V

Programme Code :	B.Sc. Mathematics (CA)	Programme Title:	Bachelor of Science Mathematics (CA)	
Course Code :	19U5MCCT15	Title : Core 15:Modern Algebra	Batch	2019-2022
Hrs/week	6 Hours		Semester	V
			Credits	3

COURSE OBJECTIVES

To enable the Students

- To recall the concepts of sets, mapping and relations.
- To explain the concepts of groups and subgroups.
- To make use of cauchy's theorem and sylow's theorem.
- To compare the concepts of homomorphism, isomorphism and automorphism of groups.
- To relate the concepts of 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	Recall the concepts of sets, mapping, relations and related examples.
C02	Explain 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 possess the ability to work within their algebraic structures.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS**UNIT I****(15 HRS)**

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

UNIT II**(15 HRS)**

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

UNIT III (15 HRS)

Homomorphisms – Cauchy's theorem for abelian groups – Sylow's theorem for abelian groups
automorphisms – Inner automorphism – Cayley's theorem, permutation groups.

UNIT IV (15 HRS)

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

UNIT V (15 HRS)

Ideals and Quotient Rings – More ideals and Quotient rings – Maximal ideal – The field of
Quotients of an integral domain

Text Book:

S.No	Author Name	Title of the Book	Publisher	Year / Edition
1	N.Herstein	Topics in Algebra	John Wiley & Sons, New York	2006/ 2 nd Edition

REFERENCE BOOK

S.No	Author Name	Title of the Book	Publisher	Year / Edition
1	S.Arumugam, A.T. Issa	Modern Algebra	Scitech Publications	2005
2	Surjeet singh, Qazizameeruddin	Modern Algebra	Vikas Publishing house	2006/8 th Edition
3	A.R. Vasishtha A.K.Vasishtha	Modern Algebra	Krishna prakashan Mandir, Meerut,	1994- 1995

WEBSITE REFERENCE

- 1.<http://ocw.mit.edu>
- 2.<http://mathforum.org>

Means of Curriculum Delivery : Lecture, Group Discussion, Seminar, Assignment, Google classroom

SEMESTER V

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Mathematics (CA)	
Course Code :	19U5MCCT16	Title : Core 16: Visual Basic	Batch	2019-2022
			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
C01	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
C01	-	✓	✓	✓	-	-	✓	-	-	-	✓	✓
C02	-	✓	✓	✓	-	-	✓	-	-	-	✓	✓
C03	-	-	✓	✓	-	-	✓	-	-	✓	✓	✓
C04	-	✓	✓	✓	-	-	✓	-	-	-	✓	✓
C05	-	-	✓	✓	-	-	✓	-	-	-	✓	✓

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-Visual Basic control tools, working with Controls, Naming and Assigning Values to 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 handlers.

UNIT IV: (12 Hours)

Procedures:Modules 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	VISUAL BASIC	Tata McGraw Hill Edition

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://visualstudio.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 :	19U5MCCP17	Title : Core 17: Visual Basic (Practical)	Batch	2019-2022
Hours/week	3 Hours		Semester	V
			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 illustrate 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 :	19U5MCET1A	Elective 1: Optimization Techniques - I	Batch	2019-2022
Hrs/week	5 Hours		Semester	V
			Credits	3

COURSE OBJECTIVES

To enable the Students

- To demonstrate the fundamentals of Operations Research.
- To develop the students understand solving LPP using various methods.
- To discover with various methods to solving transportation problems.
- To summarize 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	-	✓	✓	✓	-	-	-	-	-	-	-	✓

UNIT I**(12 HRS)**

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

UNIT II**(12 HRS)**

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

UNIT III**(12 HRS)**

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

UNIT IV**(12 HRS)**

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**(12 HRS)**

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

- <https://www.nptel.ac.in/courses-Webcourse-contents-OPTIMIZATION-METHODS-pdf-Module>
- <https://www.mech.iitm.ac.in/nspch.pdf>
- <https://www.shodhganga.inflibnet.ac.in/bitstream/10603/11449/.pdf>

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

SEMESTER V

Programme Code :	B.Sc. Mathematics (CA)	Programme Title:	Bachelor of Science Mathematics (CA)	
Course Code :	19U5MCET1B	Elective 1 : Software Engineering	Batch	2019-2022
Hrs/week	5 Hours		Semester	V
			Credits	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	-	✓	-	✓	✓	-	-	-	-	✓	-	-

UNIT I**(12 HRS)**

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**(12 HRS)**

Software Cost Estimation- Software cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Estimation Costs.

UNIT III**(12 HRS)**

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

UNIT IV**(12 HRS)**

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

UNIT V**(12 HRS)**

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 Discussion, Seminar, Assignment, Google classroom.

SEMESTER V

Programme Code :	B.Sc. Mathematics (CA)	Programme Title:	Bachelor of Science Mathematics (CA)	
Course Code :	19U5MCET1C	Elective 1 : Linear Algebra	Batch	2019-2022
Hrs/week	5 Hours		Semester	V
			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 Inner product space and orthogonality.
C04	Apply the principles of matrix algebra to linear transformations.
C05	Find Eigen values and eigen vectors by using cayley 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****(12 HRS)**

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

UNIT II**(12 HRS)**

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

UNIT III**(12 HRS)**

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

UNIT IV**(12 HRS)**

Theory of Matrices – Inverse of Matrix – Elementary Transformations

UNIT V**(12 HRS)**

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

Text Book:

S.No.	Author Name	Title of the Book	Publisher	Year / Edition
1	S.Arumugam, A.T. Issac	Modern Algebra	Scitech Publications	2006/2 nd Edition

REFERENCE BOOK:

S.No.	Author Name	Title of the Book	Publisher	Year / Edition
1	Vijay K Khanna , SK Bhambri	A Course in abstract algebra	Vikas Publishing House	4th Editon – 2013
2	Kenneth Hoffman, Ray Kunze	Linear Algebra	Phi learning Private limited	2nd Editon - 2011
3	Joseph A.Gallian	Contemporary Abstract Algebra,	Narosa Publishing House	4th Editon, Reprint – 1999

WEBSITE REFERENCE:

1.www.linear.axler.net

2.<http://mathinsight.org>

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

SEMESTER V

Programme Code :	B.Sc. Mathematics (CA)	Programme Title:	Bachelor of Science Mathematics (CA)	
Course Code :	19U5MCET2A	Elective 2 : Numerical Methods	Batch	2019-2022
Hrs/week	5 Hours		Semester	V
			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 transcendental 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	-	✓	✓	-	-	✓	-	-	-	-	✓	-

UNIT I**(12 HRS)**

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 HRS)**

Finite Difference- Differences-Operators-Forward and Backward Difference Tables-Differences of a Polynomial-Factorial Polynomial-Error Propagation in Difference Table.

UNIT III**(12 HRS)**

Interpolation(for equal intervals)-Introduction-Linear interpolation-Error in polynomial

interpolation-Newton's forward and Backward formulae-Error in Newton's forward and backward interpolation-Equidistant terms with one or more missing values

UNIT IV**(12 HRS)**

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 $1/3^{\text{rd}}$ and $3/8^{\text{th}}$ rules-Truncation error in Simpson rule.

UNIT V**(12 HRS)**

Numerical solution of first order-Taylor's series method-Taylor's series for simultaneous 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 Discussion, Seminar, Assignment, Google classroom.

SEMESTER V

Programme Code :	B.Sc. Mathematics (CA)	Programme Title:	Bachelor of Science Mathematics (CA)	
Course Code :	19U5MCET2B	Elective 2 : Number Theory	Batch	2019-2022
Hrs/week	5 Hours		Semester	V
			Credits	3

COURSE OBJECTIVES

To enable the Students

- To know the concepts of prime & Composite numbers.
- To understand the divisibility of integers and the Euclidean algorithm.
- To understand the concepts of Congruence and the application of Fermat and Wilson theorems.
- To understand the concept of primitive roots and use of Legendre's 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 multiple.
C02	Solving problems in primes and composites numbers.
C03	Understanding the concept of congruence.
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	-	-	-	✓	-	-	-	-	-	-	-	✓

UNIT I**(12 HRS)**

Divisibility: Divisibility of integer- Division Algorithm-Common Divisor-Greatest Common Divisor- The Euclidean Algorithm-To find the HCF of more that two integer-Least Common Multiple-Worked Examples.

UNIT II**(12 HRS)**

Primes and Composite Numbers: Definition of Prime, Composite, Two prime-Euclid Theorem-unique factorization Theorem-To find GCD and LCM of two integers-Positional representation of integers-Worked examples.

UNIT III**(12 HRS)**

Congruences: Definition- Theorems and worked Examples. Linear congruences: Definition- Theorems and worked examples.

UNIT IV**(12 HRS)**

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's Theorem

UNIT V**(12 HRS)**

Primitive Roots: Order of $a \pmod{m}$ -Theorems-worked Examples-Primitive 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 Number 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](http://nrich.math.org/4352)
- [2.http://www.academia.edu/29934274/100](http://www.academia.edu/29934274/100)
- [3. http://www.basic-mathematics.com/number-theory.html](http://www.basic-mathematics.com/number-theory.html)

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

SEMESTER V

Programme Code :	B.Sc. Mathematics (CA)	Programme Title:	Bachelor of Science Mathematics (CA)	
Course Code :	19U5MCET2C	Elective 2 : Digital electronics and computer fundamentals	Batch	2019-2022
Hrs/week	5 Hours		Semester	V
			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 circuits 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	-	-	✓	-	✓	✓	-	-	-	-	-	-

UNIT I**(12 HRS)**

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 HRS)**

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't care conditions – Multiplexers and Demultiplexers – Flip flops – RS, JK, D, T flip flops – Decoders.

UNIT III**(12 HRS)**

Shift Registers – Counters – Arithmetic circuits – Half adder – Full Adder – Half & full Subtractor – Binary adder & Subtractor – Serial & Parallel Binary Adders – BCD Adder.

UNIT IV**(12 HRS)**

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 HRS)**

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 Discussion, Seminar, Assignment, Google classroom.

SEMESTER-V

Programme Code :	B.Sc. Mathematics (CA)	Programme Title:	Bachelor of Science Mathematics (CA)	
Course Code :	19U5NCCT01	Non Credit Course 1 : Aptitude and Soft Skills I	Batch	2019-2022
			Semester	V
Hrs/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 behavioural 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	<i>Prof .N. Lakshmana Perumal</i>	<i>Technical English – I</i>	<i>Sri Krishna Hitech Publishing Company (P) Ltd</i>
2	<i>R. S. Aggarwal</i>	<i>Quantitative Aptitude for Competitive Examinations,</i>	English, Paperback

REFERENCE BOOK

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.

SEMESTER-V

Programme Code	B. A. English Literature	Programme Title	Bachelor of English Literature	
Course Code:	19U5SSCT03	Self Study Course III: General Awareness	Batch	2019-2022
			Semester	V
Hrs/ Week	-		Credits	1

COURSE OBJECTIVES:

- 1.It aims at testing the candidates' general awareness and knowledge of current affairs occurring around the world and in India.
- 2.Develops a commitment to citizenship, through the ability to make informed decisions about public issues.
- 3.Create an awareness of the achievements and perspectives of people of different nations and cultures, and of different races, genders and ethnicities.

COURSE OUTCOMES (CO):

On Successful Completion of the course the students will be able to:

CO NO.	CO Statement
CO1	Get familiar with general awareness of the environment around him and its apply it to the society.
CO2	Reason logically, abstractly and understand numerical data comprehend arguments and positions that depend on numbers and statistics.
CO3	Have a critical understanding of one's own values and of others, and of their role in making ethical choices.

MAPPING WITH PROGRAMME OUTCOMES

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

SYLLABUS

Unit I

Verbal Aptitude

History and Freedom Struggle

Unit II

Abstract Reasoning

Tamil and other Literature

Unit III

General Science and Technology

Computer

Unit IV

Economics and Commerce

Social Studies

Unit V

Sports

Current Affairs

TEXT BOOKS:

S. No	Author Name	Title of the Book	Publisher	Year /Edition
1	Compiled By Faculty, Department of English	General Awareness, Question Bank	Kovai Kalaimagal College of Arts and Science, Coimbatore- 09	First Edition: 2021

Means of Curriculum Delivery : The students can study by themselves with the prescribed material.

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6MCCT18	Core :18:Complex Analysis	Batch	2019-2022
Hrs/week	6 Hrs.		Semester	VI
			Credits	4

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 HRS)**

Analytic functions- Differentiability and Analyticity of a function – Necessary conditions for Differentiability(C-R equation) – sufficient conditions for Differentiability – C-R equation in polar Co-ordinates – Harmonic functions.

UNIT II**(15 HRS)**

Elementary and Conformal Mappings: Bilinear transformations (Möbius transformation) – Special Bilinear transformations– Circles and Inverse Points – Transformations $w = z^2, z^{1/2}, e^z$, $\sin z$ and $\cos z$ – conformal mappings.

UNIT III**(15 HRS)**

Complex Integration – Simple rectifiable oriented curves – Integration of complex functions – Definite Integral – Cauchy's Fundamental theorem – Goursat's lemma – Cauchy's Integral formula – Morera's theorem – Cauchy's inequality – Liouville's theorem – Fundamental theorem of Algebra – Maximum modulus theorem – Gauss' Mean value theorem.

UNIT IV**(15 HRS)**

Taylor's and Laurent series – Taylor's series – zeros of an analytic function– Laurent's series – Types of singularities and problems.

UNIT V**(15 HRS)**

Residues – Calculation of Residues – Residue theorem – Evaluation of real 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	Complex Analysis,	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 Discussion, Seminar, Assignment, Google classroom.

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6MCCT19	Core :19: Discrete Mathematics	Batch	2019-2022
Hrs/week	6 Hrs.		Semester	VI
			Credits	3

COURSE OBJECTIVES

To enable the students

- To make the students to understand the mathematical logic in the concepts of tautology.
- To discover the 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 grammars 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	-	✓	-	-	-	✓	-	-	-	-	-	✓

UNIT I (15 HRS)

Mathematical Logic- Statements and Notations - Connectives – Negation - Conjunction - Disjunction - Conditional and bi-Conditional- Well Formed Formulas -Tautology - Equivalence of Formulas - Algebra and Duality.

UNIT II (15 HRS)

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 (13 HRS)

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 (17 HRS)

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 (15 HRS)

Finite state-Machine: State table & state diagram of a Finite state machine – Input & Output Tapes – Binary addition. Finite state Automata; Deterministic Finite – State Automaton (DFA) – Language Recognised by an Automaton – Non-Deterministic Finite state Automaton – Equivalence of DFA & NFA.

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 applications 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/~aralal/book/mth202.pdf>

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

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6MCCT20	Title : Core 20: MATLAB	Batch	2019-2022
Hrs/week	5 Hrs.		Semester	VI
			Credits	3

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 know 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 equation 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 HRS)**

Introduction – Basics of MATLAB-MATLAB Windows-Online help-Input-Output, File types-General Commands

UNIT II (12 HRS)

Interactive Computation - Matrices and Vectors- Matrix and Array Operations-Command line Functions-Using Built in Functions and ON-line Help

UNIT III (12 HRS)

Applications- Linear Algebra-Curve fitting and Interpolation-Data analysis and Statistics

UNIT IV (12 HRS)

Numerical Integration-Ordinary Differential Equations-Nonlinear Algebraic Equations.

UNIT V (12 HRS)

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	<i>Rudra Pratap</i>	<i>Matlab-7,</i>	<i>Oxford University Press, New Delhi-</i>
2	<i>V.Kirani Singh, B.B. Chandhur</i>	<i>MATLAB Programming</i>	<i>Printice Hall of India Private Limited, New Delhi-</i>

WEBSITE REFERENCE

1. <https://www.mathworks.com>
2. [https://www.Mathworks.com/matlab central/mathlab/ref/.html](https://www.Mathworks.com/matlab%20central/mathlab/ref/.html)

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

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6MCCP21	Title : Core 21: MATLAB -Practical	Batch	2019-2022
Hrs/week	3 Hrs.		Semester	VI
			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 plot and ez 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

CORE 22 :PROJECT WORK VIVA-VOCE

Subject Code: 19U6MCCV22

No.of Credits: 4

Objective: To enable the students to apply practically in a specific area using any specific domain knowledge he/she posses and get the results.

GUIDELINES FOR PROJECT WORK

1. The aim of the project work is to acquire practical knowledge on the implementation of the Mathematical concepts studied.
2. Each student should carry out individually one project work and it may be a work using the some new topics that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea focusing on application oriented concepts.
3. The project work should be compulsorily done in the college only under the supervision of the department staff concerned.

FINAL VIVA-VOCE

Project work carries 100 marks with 4 credits.

Internal Assessment: 80 marks (60 marks for 3 reviews and 20 marks for record)

External Assessment : 20 marks (Viva-Voce).

For awarding a pass, a candidate should have obtained 40% of the total 100 Marks.

The evaluation would be done jointly by both the examiners(Internal and External). Students who fail in the project work and viva-voce examination or who are absent for the project viva-voce who fail to submit the project report before the due date will have to re-submit the project work and appear for the viva-voce examination during the subsequent year.

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6MCET3A	Elective 3 : Optimization Techniques - II	Batch	2019-2022
Hrs/week	5 Hrs.		Semester	VI
			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 discover about various types of inventories and their control and method of calculating EOQ.
- To know about Network scheduling 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 scheduling 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 HRS)**

Game Theory: Two person zero sum game- The Maxmini- Minimax Principle-Problems-Solution of 2×2 rectangular Games-Domination Property- $(2 \times n)$ and $(m \times 2)$ graphical method-Problems. Queueing Theory- Introduction-Queueing system-Characteristics of Queueing system-Symbols and notations-Classifications of queues-Problems in $(M/M/1):(\infty/FIFO)$; $(M/M/1):(N/FIFO)$; $(M/M/C):(N/FIFO)$ - $(M/M/C):(\infty:FIFO)$

UNIT II**(12 HRS)**

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 HRS)**

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 HRS)**

Replacement Problem: Introduction- Replacement of Equipment/asset that deteriorates gradually-Replacement of equipment that fails suddenly and problems.

UNIT V**(12 HRS)**

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	Operations 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	Operations 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 Discussion, Seminar, Assignment, Google classroom.

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6MCET3B	Elective 3 : Actuarial Mathematics	Batch	2019-2022
Hrs/week	5 Hrs.		Semester	VI
			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 Mortgage 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 HRS)**

Basics of Probability and Interest- Probability – Theory of Interest: Variable Interest

Rates – Continuous – time payment Streams – Problems. Interest & Force of Mortality- More on Theory of Interest – Annuities & Actuarial Notation – Loan Amortization & Mortgage 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 HRS)

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 HRS)

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 HRS)

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 Survival Function Estimator – Problems.

UNIT V

(12 HRS)

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 & Portfolio Risks – Problems.

Text Book:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	Eric V.Slud	Actuarial Mathematics and Life – Table Statistics,	Mathematics Department, University of Maryland, College Park	Edition- 2001

Reference Books:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	Jerry Alan veeh	Lecture Notes on Actuarial Mathematics (E-Notes),		2006.
2	Bowers, N.Gerber, H.Hickman, J.Jones, and Nesbitt	C. Actuarial Mathematics	Society of Actuaries, tasca, III -	1986.
3	Feller: W	An Introduction to Probability Theory and its Applications,		Vol.I, 2 nd ed. Wiley, New York - 1957.
4	Gerber.H.Life	Insurance Mathematics		Third ed. Springer – Verlag, Newyork - 1997

WEBSITE REFERENCE

- [1.https://www.studocu.com/document/university/actuarial-mathematics](https://www.studocu.com/document/university/actuarial-mathematics)
- [2.https://www.academia.edu/9875397/Lecture Notes on Actuarial Mathematics](https://www.academia.edu/9875397/Lecture_Notes_on_Actuarial_Mathematics)

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

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6MCET3C	Elective 3 :Information Security	Batch	2019-2022
Hrs/week	5 Hrs.		Semester	VI
			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 legal, ethical and professional issues in information 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 legal, ethical and provisional issues in information 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 HRS)**

Introduction to Information Security- History -What is Security- Critical Characteristics 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 HRS)**

The Need For Security: Introduction-Business Needs: Protecting the functionality 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 HRS)**

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 HRS)**

Risk Management: Introduction-An overview of Risk Management; Risk Identification: Asset Identifcation 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 Assessment-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 HRS)**

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:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	<i>E.Michel Whitman, CISSP and Herbert, J. Mattord, CISSP</i>	<i>Principles of Information Security, Thomson Course Technology,</i>		<i>Second Indian Reprint – 2007.</i>

Reference Books:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	Mark Rhodes-Ousley	<i>The Complete Reference, Information Security</i>	McGraw Hill Education Private Limited	Indian Edition – 2013
2	Thomas R.Pelties	<i>Information Security Fundamentals, BN5.</i>		

WEBSITE REFERENCE

1. www.geeksforgeeks.org
2. <http://www.cisco.com>

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

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6MCET4A	Elective 4 :Fuzzy Mathematics	Batch	2019-2022
Hrs/week	5 Hrs.		Semester	VI
			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 HRS)**

From classical sets to Fuzzy sets: Introduction-Crisp Sets: An over view-Fuzzy set: Basic types-Fuzzy sets: Basic Concepts-Characteristics and significance of the paradigm Shift

UNIT II**(12 HRS)**

Fuzzy sets of versus crisp sets: Additional properties of α - Cuts- Representations of fuzzy sets-Extension Principle of Fuzzy sets.

UNIT III**(12 HRS)**

Operations on fuzzy sets: Types of Operations-Fuzzy complements-Fuzzy Intersections: t-Norms-Fuzzy unions: t-conorms

UNIT IV**(12 HRS)**

Fuzzy Arithmetic: Fuzzy Numbers-Linguistic Variables-Arithmetic Operations on intervals

UNIT V**(12 HRS)**

Fuzzy Relations: Crisp versus Fuzzy Relations-Projections and Cylindrical Extensions-Binary Fuzzy Relations-Binary relations on a single set-Fuzzy Equivalence Relations-Fuzzy Compatibility Relations.

Text Book:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	George, J.Klir and Tina A, Folger	<i>Fuzzy Sets Uncertainty and Information</i>	<i>Printice Hall of India Pvt Ltd, New Delhi</i>	2006.

Reference Books:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	John Yuan, Reza Langari	<i>Fuzzy Logic Intellegence, Control and information,</i>	Pearson Education New Delhi	1999
2	M.Amirthavalli:	<i>Fuzzy logc and Neural Networks</i>	Scitech Publications Pvt Ltd, Chennai and Hydrabad	2007
3	Timothy , Jo Ross	<i>Fuzzy Lgic with Engineering Applications,</i>	McGraw-Hill INC, New York	1996.

WEBSITE REFERENCE

1. www.iasri.res.in
2. www.tutorialspoint.com/fuzzy-logic

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

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6MCET4B	Title : Elective 4 : Graph Theory	Batch	2019-2022
Hrs/week	5 Hrs.		Semester	VI
			Credits	3

COURSE OBJECTIVES

To enable the students

- To describe about the various types of graphs and operations on them.
- To illustrate the various types of trees and their properties.
- To demonstrate the concepts of planar and dual graph.
- To construct the matrix representation of graphs.

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 Planar and Dual graph
C05	Understand the Matrix Representation of Graphs.

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 Hrs)**

Connected graphs, Disconnected graphs and Components-Euler Graphs-Operation on graphs-More on Euler Graphs

UNIT II**(12 Hrs)**

Trees: Properties of Trees-Rooted trees-Binary trees- Binary Search Trees- Decision Trees.

UNIT III**(12 Hrs)**

Spanning Trees: Definition and Properties of Spanning Trees-Algorithm on Spanning Trees-Minimal Spanning Trees-Travelling Salesman Problem-Huffman code.

UNIT IV**(12 Hrs)**

Planar and Dual Graphs: Kuratowski's Two gGraphs – Detection of Planarity – Geometric Dual – Combinatorial Dual – Thickness and Crossings.

UNIT V**(12 Hrs)**

Matrix Representation of Graphs: Incidence Matrix – Fundamental Circuit Matrix and Rank of B – Cut-set Matrix – Relationships among A_f , B_f and C_f – Path Matrix – Adjacency Matrix.

Text Book:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
2	Narsingh Deo	Graph Theory with applications to engineering and computer science	Prentice Hall of India, New Delhi	2005

Reference Books:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
4	S.Kumaravelu & Susheela Kumaravelu	Graph Theory	Janki Calender Corporation, Sivakasi	1999.

WEBSITE REFERENCE

- [1.http://www.indiabix.com](http://www.indiabix.com)
- [2.http://placement.freshersworld.com](http://placement.freshersworld.com)

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

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6MCET4C	Elective 4 : Computer Networks	Batch	2019-2022
Hrs/week	5 Hrs.		Semester	VI
			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 Hrs)**

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 Hrs)**

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 Hrs)**

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 Hrs)**

Network Layer- Routing algorithms – Congestion Control Algorithms. Transport Layer- Elements of Transport Protocols – Internet Transport Protocols- TCP.

UNIT V**(12 Hrs)**

Application Layer- DNS – E-mail- Network Security- Cryptography – Symmetric Key Algorithms – Public Key Algorithms – Digital Signatures.

Text Book:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	Andrew S. Tanenbaum	Computer Networks	PHI, Pearson's Prentice Hall-	4th edition, 2005.

Reference Books:

S. No.	Author Name	Title of the Book	Publisher	Year / Edition
1	Achyut Godbole	Data Communication And Networks, TMH		2007.
2		Computer Networks Protocols, Standards, and Interfaces	Uyless Black,	2nd ed, PHI.

WEBSITE REFERENCE

1. <http://www.geekforgeeks.org>
2. <http://www.guru99.com>

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

SEMESTER VI

Programme Code :	B.Sc. Mathematics (CA)	Programme Title	Bachelor of Science Mathematics (CA)	
Course Code :	19U6NCCT02	Non Credit Course 2: Aptitude and Soft Skills II	Batch	2019-2022
Hrs/week	3 Hrs.		Semester	VI
			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 behavioural 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: 2019ECC001

No. of Credits: 2

அலகு ஐ

1. சுற்றுலா – ஒரு விளக்கம்
2. உலக நாடுகளில் சுற்றுலா வளர்ச்சி
3. பாரதத்தில் சுற்றுலா வளர்ச்சி

அலகு ஐஐ

1. தமிழ்நாட்டில் சுற்றுலா வளர்ச்சி
2. பன்னாட்டு பலவகைப் பயணிகள்
3. சுற்றுலாவின் சமூக பொருளாதார விளைவுகள்

அலகு ஐஐஐ

1. சுற்றுலாப் பயணிகள் பற்றிய புள்ளி விவரங்கள்
2. சுற்றுலாவைத் திட்டமிடுதலும் மேம்படுத்தலும்
3. சுற்றுலா விடுதிகள்

அலகு ஐஐ

1. சுற்றுலாப் பயணிகளின் பல்வேறு போக்குவரத்துகள்
2. சுற்றுலாக் கழகங்கள்
3. சுற்றுலாப் பயண முகவர்கள்

அலகு ஏ

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: 2019ECC002

No. of Credits: 2

அலகு ஐ 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 ஐஐ இதழியல் தோற்றமும் வளர்ச்சியும்

1. இதழியல் வளர்ச்சி
2. தமிழகத்தில் இதழியல் வளர்ச்சி
3. பத்திரிக்கைச் சட்டங்கள்
4. பத்திரிக்கை மன்றம்

அலகு ஐஐஐ இதழ்களின் அமைப்பு முறை

1. இதழ்கள் தொடங்குவதற்கான வழிமுறைகள்
2. செய்தித்தாள் நிர்வாக அமைப்பு

அலகு ஐஐ 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 ஏ 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 ஃபைன் ஆர்ட்ஸ்

சிவகாசி

ஜனவரி – 2009.

நாட்டுப்புறவியல்

Subject Code: 2019ECC003

No. of Credits: 2

அலகு ஐ

நாட்டுப்புற இயல் என்றால் என்ன?
நாட்டுப்புற இயலின் வரலாறு
நாட்டுப்புற அயல் கல்வி – ஒரு விளக்கம்

அலகு ஐஐ

நாட்டுப்புற ஆடல்கள்
நாட்டுப்புற கூத்துகள்
நாட்டுப்புற கைவினைக் கலைகள்

அலகு ஐஐஐ

நாட்டுப்புற விளையாடல்கள்
நாட்டுப்புற மருத்துவம்
நாட்டுப்புற நம்பிக்கைகள்

அலகு ஐஐ

நாட்டுப்புற வழிபாடுகள்
நாட்டுப்புறக் கதைகள்
நாட்டுப்புறப் பாடல்கள்
கதைப்பாடல்கள்

அலகு ஏ

விடுகதைகள்
பழமொழிகள்
புராணங்கள்

பாடநூல் : நாட்டுப்புறவியல்
ஆசிரியர் : ச. கண்முக சுந்தரம்
காவ்யா பதிப்பகம்,
ஏப்ரல் - 2017.

கணிப்பொறியில் தமிழ்

Subject Code: 2019ECC004

No. of Credits: 2

அலகு ஐ

கணிப்பொறியில் தமிழ்
விசைப்பலகை அமைப்பு முறைகள்
எழுத்துருவின் வகைகள்

அலகு ஐஐ

தமிழ் எழுத்துருக்கள்
எழுத்துரு ∴ விசைப்பலகை இயக்கியை நிறுவுதல்

அலகு ஐஐஐ

தமிழில் தட்டச்சு செய்யும் முறை
சிக்கல்களும் தீர்வுகளும்

அலகு ஐஐஐ

இணையத்தில் தமிழ்
தமிழ் இணையப் பல்கலைக்கழகம்
மின்னஞ்சல்

அலகு ஏ

யூனிக்கோடு
விண்டோஸ் எக்ஸ்பீயில் தமிழ்
தமிழ் இணையதளங்கள்

ஆசிரியர் : த. பிரகாஷ்
பெரிகாம் நூல் வெளியீடு மற்றும் விற்பனை
ஆகஸ்டு – 2007.

தமிழக வரலாறும் மக்கள் பண்பாடும்

Subject Code: 2019ECC005

No. of Credits: 2

அலகு ஐ

1. தமிழக வரலாற்றுக்கான அடிப்படை ஆதாரங்கள்
2. தமிழகத்தின் இயற்கை அமைப்புகள்.
3. வரலாற்றுக் காலத்துக்கு முந்திய தமிழகம்.
4. சிந்து வெளி அகழ்வாராய்ச்சி.

அலகு ஐஐ

1. பண்டைய தமிழரின் அயல்நாட்டு தொடர்புகள்
2. தமிழ் வளர்த்த சங்கம்
3. சங்க இலக்கியம்
4. பண்டைய தமிழரின் வாழ்க்கை

அலகு ஐஐஐ

1. களப்பிரர்கள்
2. பல்லவர்கள்
3. தமிழகத்தில் நான்காம் நூற்றாண்டு முதல் ஒன்பதாம் நூற்றாண்டு வரையில் சமூக நிலை.

அலகு ஐஐஐ

1. சோழப் பேரரசின் தோற்றம்.
2. சோழப் பேரரசின் வளர்ச்சியும் வீழ்ச்சியும்.
3. சோழர் காலத்தில் தமிழரின் சமுதாயம்.
4. பாண்டியரின் ஏற்றமும் வீழ்ச்சியும்.

அலகு ஏ

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: 2019ECC006

No. of Credits: 2

அலகு ஐ

1. காலப்போக்கில் கன்னித்தமிழ் ஒரு கண்ணோட்டம்
2. தமிழ்ச்சங்கம்
3. அகத்தியர்
4. தொல்காப்பியர்
5. சங்க இலக்கியம்
6. பதினெண் கீழ்கணக்கு

அலகு ஐஐ

1. இரட்டைக் காப்பியங்கள்
2. நாயன்மார்கள்
3. ஆழ்வார்கள்
4. சமயமும் தமிழும் (பௌத்தம், சமணம், சைவம், வைணவம்)
5. கன்னித் தமிழ் காப்பிய வளர்ச்சி
6. புராணங்களும் பிறவும்.

அலகு ஐஐஐ

1. சிற்றிலக்கியங்கள்.
2. பதினெண் சித்தர்கள்.
3. உரையாசிரியர்கள்.
4. பிற்காலப் புலவர்கள்.
5. கிருத்துவமும் தமிழும்.
6. இஸ்லாமியமும் இன்தமிழும்.

அலகு ஐஐஐ

1. சோழப் பேரரசின் வளர்ச்சியும் வீழ்ச்சியும்.
2. கவிஞர் பெருமக்கள்.
3. புதக்கவிதை.
4. உரைநடை இலக்கியம், சிறுகதை இலக்கியம்.

அலகு ஏ

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: 2019ECC007

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 Chakravarty, 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: 2019ECC008

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: 2019ECC009

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 self-esteem, 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: 2019ECC010

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: 2019ECC011

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: 2019ECC012

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:

Refraction – 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: 2019ECC013

No. of Credits: 2

Objective:

- To know the basic concepts of fuzzy sets 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 classical sets to Fuzzy sets: Introduction-Crisp Sets: An over view-Fuzzy set: Basic types-Fuzzy sets: Basic Concepts-Characteristics and significance of the paradigm Shift

UNIT II

Fuzzy sets of versus crisp sets: Additional properties of α - 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-conforms

UNIT IV

Fuzzy Arithmetic: Fuzzy Numbers-Linguistic Variables-Arithmetic Operations on intervals

UNIT V

Fuzzy Relations: Crisp versus Fuzzy Relations-Projections and Cylindrical Extensions-Binary Fuzzy Relations-Binary relations on a single set-Fuzzy Equivalence Relations-Fuzzy Compatibility Relations.

Text Book:

Fuzzy Sets Uncertainty and Information, George, J.Klir and Tina A, Folger, Printice Hall of India Pvt Ltd, New Delhi, 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 Intelligence, Control and information, John Yuan, Reza Langari, Pearson Education, New Delhi, 1999
2. Fuzzy logic and Neural Networks, M.Amirthavalli, Scitech Publications Pvt Ltd, Chennai and Hydrabad, 2007
3. Fuzzy Logic with Engineering Applications, Timothy , Jo Ross, McGraw-Hill INC, New York, 1996.

OPERATIONS RESEARCH

Subject Code: 2019ECC014

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 – $m \times 2$ and $2 \times n$ 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: 2019ECC015

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 Mathematics 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: 2019ECC016

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 IV

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: 2019ECC017

No. of Credits: 2

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. Gordon 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: 2019ECC018

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-Defining 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: 2019ECC019

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 environment 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 Persistence – 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 Expressions.

UNIT III

Decision Making and Branching :if,if...else, nested if, switch – Decision 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: 2019ECC020

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. Functions: 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: 2019ECC021

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 design 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 Madiseti 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: 2019ECC022

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: 2019ECC023

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: 2019ECC024

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 – Medium Access 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: 2019ECC025

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 schedules 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 Hill Education Private Limited, 1st Edition 2009

REFERENCE BOOKS:

1. Arshdeep Bahga, Cloud Computing: A Hands-On Approach, Paperback-Import,, Dec 2013..

CROSS CULTURE MANAGEMENT

Subject Code: 2019ECC026

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: 2019ECC027

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 10th and 11th 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: 2019ECC028

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 Finance- 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: 2019ECC029

No. of Credits: 2

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- Challenges- 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 Promotion 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 Exchange 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: 2019ECC030

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: 2019ECC031

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, Pothe 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: 2019ECC032

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 Cause - Tariff Advisory Committee – Legal Aspects of Life Assurance - Global Insurance Regulatory Framework.

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 – Lloyd's 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: 2019ECC033

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: 2019ECC034

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 impart 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 starting 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 : 2019ECC035

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 : 2019ECC036

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 : 2019ECC037

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 Medium 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, Springer publications, Edition 2012.

4.Sarika Lohana, Medium, Micro and Small Enterprises, New century Publications, 1st Edition 2014.

TOURISM MANAGEMENT

Sub Code : 2019ECC038

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: 2019ECC039

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: 2019ECC040

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 : 2019ECC041

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 : 2019ECC042

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: 2019ECC043

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: 2019ECC044

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 Loyalty- Brand Extention- Conditioning Theories- Cognitive Learning Theory- Attitude and Attitribute theory- Cognitive Dissonance- Self Concept- Development of Self- Fashion – Cosmetics- and Conspicuous 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: 2019ECC045

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: 2019ECC046

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. Ruonaryan Bose, Fundamentals of International Banking, Laxmi Publications, Edition-2014.

2. Indian 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: 2019ECC047

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: 2019ECC048

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 Douppnik,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: 2019ECC049

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: 2019ECC050

No. of Credits: 2

Objectives:

To enable the students understand 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 - Characteristics 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 Implementation – Methodology for BPR Implementation – Role of IT in BPR – BPR and ERP Systems – BPR success / failure factors.

UNIT III

Planning for ERP – Planning for ERP Implementation – Understanding Organizational Requirements. - Understanding Economic and Strategies Justification – Analysing Project Scope – Determining Resources – Creating Budget for ERP Implementation – Selecting the Right ERP Package- Preparing Organizations for ERP Implementation. **Implementation of ERP:** Designing for ERP systems – ERP implementation approaches – ERP implementation Life cycle.

UNIT IV

Managing ERP Projects: Risk Failure factors in ERP Implementation – Examples of ERP Failure- Mitigating implementation risks – Management and complexity of Large scale ERP Projects- Training users to use ERP Systems. - Evaluating ERP Projects.

UNIT V

ERP Going live and post implementation: 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 Boundaries:** Service oriented architecture – Enterprises application integration – Application Services provider – Model for ERP implementation.

TEXT BOOKS:

Ashim raj singla – Enterprise Resource Planning – Cengage Learning india Pvt . Ltd 2008