SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
(AFFILIATED TO MADURAI KAMARAJ UNIVERSITY, MADURAI
RE-ACCREDITED WITH 'A' GRADE (THIRD CYCLE) BY NAAC WITH CGPA 3.11)

Programme Scheme, Scheme of Examination and Syllabi

(From 2021-2022 Batch onwards)

Department of Mathematics

UG Programme

Approved in the Academic Council – XIII held on 11/08/2021

Curriculum Design and Development Cell
Annexure J

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(AFFILIATED TO MADURAI KAMARAJ UNIVERSITY, MADURAI
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Curriculum Design and Development Cell

HOD	Dean of Pure Science	Dean of Academic Affairs	Principal

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
MEMBERS OF BOARD OF STUDIES

S.No.	Board Members	Name and Designation
1.	Chairman of the Board	**Ms.K.Lalithambigai** Head & Assistant Professor of Mathematics Sri Kaliswari College (Autonomous), Sivakasi.
2.	University Nominee	**Dr. S.Lalithambigai** Assistant Professor Department of Mathematics Madurai Kamaraj University, Madurai.
3.	Academic Expert 1.	**Dr. C.Parameswaran** Associate Professor and Head Centre for Research and Post Graduate Studies in Mathematics, Ayya Nadar Janaki Ammal College Sivakasi.
4.	Academic Expert 2.	**Dr. M.Jeyaraman** Assistant Professor Department of Mathematics R.D. Government Arts College Sivagangai
5.	Industrialist	**MAPR.Krishnamoorthy** Partner, Palani Industries Virudhunagar.
6.	Alumnus	**Dr.G.Ramkumar** Assistant Professor Department of Mathematics Arul Anandar College Karumathur.
Members		
7.	Dr.A.Subramanian	Guest Faculty in Mathematics
8.	Mrs.M.Kaleeswari	Assistant Professor of Mathematics
9.	Ms.M.Theivanayaki	Assistant Professor of Mathematics
10.	Mrs.M.Andal	Assistant Professor of Mathematics
11.	Mrs.J.Maria Jeya Priya	Assistant Professor of Mathematics
12.	Ms.N.Maheswari	Assistant Professor of Mathematics
13.	Dr.G.Sangeetha	Assistant Professor of Mathematics
14.	Mr.T.Gurunathan	Assistant Professor of Mathematics
15.	Mrs.S.Mahalakshmi	Assistant Professor of Mathematics
16.	Mrs.S.Anubala	Assistant Professor of Mathematics

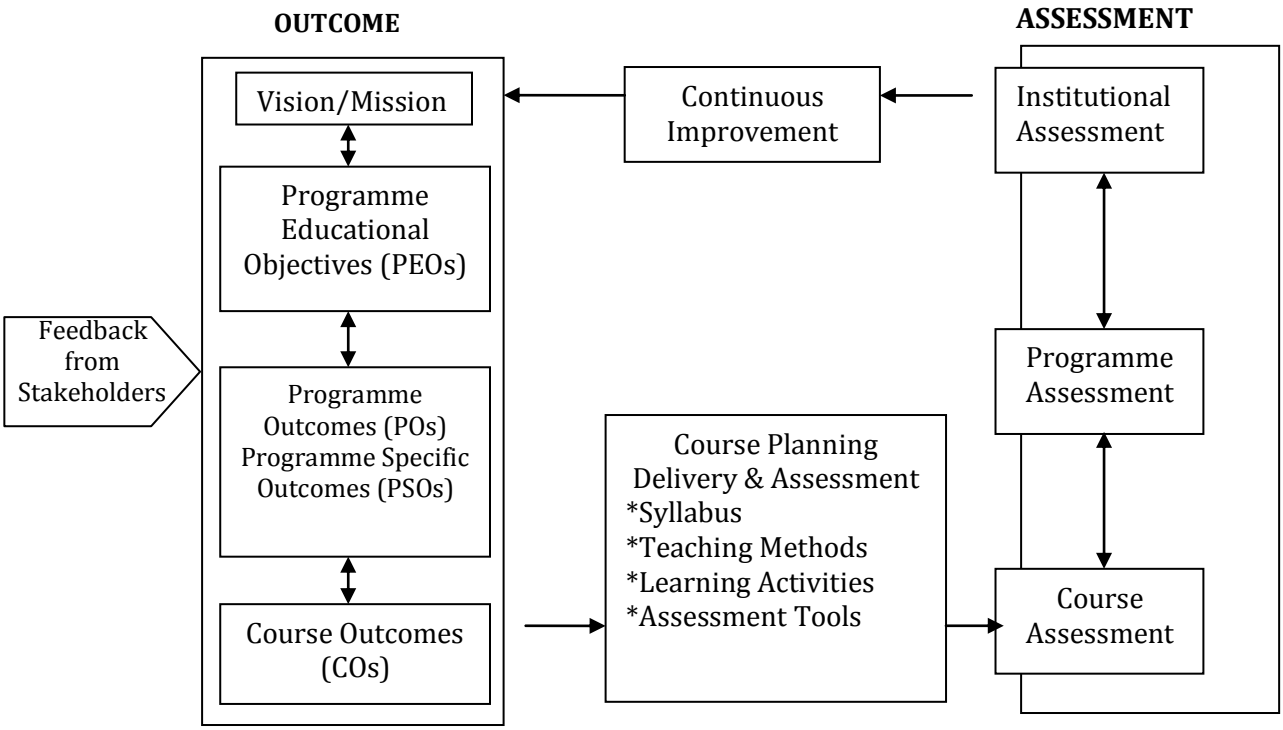
SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
(Affiliated to Madurai Kamaraj University, Re-accredited with A Grade (CGPA 3.11) byNAAC)
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
GUIDELINES FOR OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

INTRODUCTION

Sri Kaliswari College in its pursuit of imparting quality education has marked a remarkable growth in terms of academic excellence, infrastructure, student strength, ICT facilities, library and placement records since its establishment in 2000-2001.This institution constitutes an academic community that is committed to encourage the student community to experience and share knowledge, identify their potential, enhance the employability skills and enable them to pursue their goals. After the conferment of autonomous status in the year 2012, the college has so far gone for revision of the syllabi three times and is continually updating the syllabi to meet the needs and demands of the student community.

The institution in its success journey of imparting quality education has been Re-Accredited with A grade (CGPA 3.11) in its third cycle of accreditation by NAAC. As an added feather to its cap, the institution has taken a giant leap to embrace the Outcome-Based Education system to enable the student community to develop their knowledge, skill and attitude simultaneously through a focused learning and help the graduates to compete with their global counterparts and prepare them for life.

I. OUTCOME-BASED EDUCATION (OBE) FRAMEWORK



II. VISION OF THE INSTITUTION

- To impart quality higher education to produce highly talented youth capable of developing the nation

III. MISSION OF THE INSTITUTION

- Ensuring quality in all aspects of the activities
- Developing the latent skills of the rural youth
- Providing value - based education to instill courage and confidence
- Nurturing the entrepreneurial skills of the rural youth
- Creating competency to meet global challenges
- Imbibing social awareness and social responsibilities

IV. VISION OF THE DEPARTMENT

- To create a sound academic ambience to produce competent youth to excel in research and teaching in Mathematics along with concern for society

V. MISSION OF THE DEPARTMENT

- To impart quality education and inculcate the spirit of research through innovative teaching and research methodologies in Mathematics.
- To empower students with required skills to succeed in the ever-changing world.
- To provide innovative training to apply mathematical and computational skills to model, formulate and solve real life problems.

VI. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The Graduates will

PEO1: demonstrate a thorough knowledge of fundamental mathematical facts, and solve problems which can be analyzed mathematically.

PEO2: solve complex scientific problems by mathematical simulations.

PEO3: work as mathematical professionals developing knowledge and insights in Mathematics with personal development in work place and in the society.

PEO4: embrace moral and ethical values and demonstrate team work and leadership skills in their career opportunities and academics.

PEO5: pursue higher studies, conduct research, and appear for SSC(CGL), IBPS, RRB and Civil service examinations with confidence developing inclination towards lifelong learning.

VII. PROGRAMME OUTCOMES (POs)

PO1: Disciplinary Knowledge

Acquire comprehensive and Scientific knowledge in the field of science.

PO2: Critical Thinking, Problem Solving and Analytical Reasoning

Develop students' ability of critical observation and capacity to apply the principles/facts of science to identify, analyse, evaluate and solve problems in order to draw realistic conclusions.

PO3: Scientific Reasoning and Research Related Skills

Capability to involve in planning and conducting experiments, analyze the scientific research field, interpret and draw conclusions from experiments and investigate practically.

PO4: Communication Skills and Digital Literacy

Communicate effectively and articulate clearly the scientific ideas in written and oral form and make use of appropriate software for scientific computations and gain ICT skills to disseminate knowledge.

PO5: Ethics, Values and Multicultural Competence

Embrace moral and ethical values and apply it with a sense of responsibility in the workplace and community and adopt objective, unbiased and truthful actions in all aspects of work.

PO6: Team Work, Leadership and Employability Skills

Work effectively and respectfully in groups with enhanced inter-personal skills and exhibit qualities associated with leadership to build a team and achieve the vision and show proficiency in professional, employability and soft skills required for placements and higher education.

PO7: Self-directed and Life-long Learning

Recognize the need and have the ability to engage in independent learning and be self - motivated and acquire knowledge through lifelong learning in the broadest context of technological change.

VIII. PROGRAMME SPECIFIC OUTCOMES (PSOs) – B.Sc. MATHEMATICS

On successful completion of B.Sc. Mathematics, the students will

PSO1: develop a comprehensive knowledge in the field of Algebra, Analysis, Geometry, Number Theory, Mechanics, Differential Equations and Statistics.

PSO2: employ critical thinking in understanding the concepts in every area of Mathematics and provide solutions using the domain knowledge of Mathematics.

PSO3: demonstrate a broad knowledge to conduct research and analyse mathematical concepts, and theories within appropriate mathematical framework.

PSO4: communicate various concepts of mathematics effectively using examples and their geometrical visualizations and demonstrate a computational ability in solving a wide array of mathematical problems.

PSO5: embrace moral and ethical values, adopt objective, unbiased and truthful actions in all aspects and identify unethical behaviour such as fabrication, falsification or misrepresentation of data.

PSO6: work independently and effectively in team as a member or leader and gain knowledge and aptitude needed to successfully get through the competitive examinations either for placement or for higher education.

PSO7: acquire knowledge and skills through logical reasoning and to inculcate the habit of self- directed and life-long learning.

IX. PO-PSO Mapping Matrix – B.Sc. Mathematics

PO / PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
PO1	✓						
PO2		✓					
PO3			✓				
PO4				✓			
PO5					✓		
PO6						✓	
PO7							✓

X. PO-PEO Mapping Matrix – B.Sc. Mathematics

PO / PEO	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	✓				
PO2	✓				
PO3		✓			✓
PO4			✓		
PO5				✓	
PO6			✓	✓	✓
PO7					✓

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
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DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics

REGULATIONS

Duration of the Programme **:** Three years (equivalent to six semesters)

Eligibility

Candidate should have passed the Higher Secondary Examinations with Mathematics, Physics and Chemistry as subjects conducted by the Board of Higher Secondary Education, Government of Tamil Nadu or any other examination accepted by the Syndicate of the Madurai Kamaraj University, Madurai as its equivalent.

Medium of Instruction : English

Age Limit

Maximum age limit : 21 Years

Age Relaxation

SC/ SCA/ST/BC/BCM/MBC/DNC & Women : 3 years age relaxation
Differently-Abled Students : 5 years age relaxation

Transitory Permission

Students joined from 2021 - 2024 may be permitted to write their examinations in this pattern up to April 2029.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SCHEME OF EXAMINATION

For both UG and PG Programmes, the internal and external marks are distributed as follows:

For all Theory Courses : Internal Marks: 40; External Marks: 60

For all Practical Courses, Project and Internship : Internal Marks: 50; External Marks: 50

For Comprehensive Examination : External Marks: 100

Internal Mark Distribution for Theory Courses

Assessment Type	Marks	Scheme of Assessment
Internal Test	15 marks	Two Internal Tests and 1 Model Exam will be conducted and average of the best two will be considered
Written Assignment	5 marks	One Written Assignment will be given
E-Assignment/ Case Studies/ Reviews/ Field Assignments/ Poster Presentations/ Portfolios	5 marks	Any one of the Assignments will be given
Quiz	5 marks	One Quiz Test will be conducted
Viva/ Oral Exam/ Group Discussion/ Role Play	10 marks	Test will be conducted in any one of the Oral Mode

Internal Mark Distribution for Practical Courses

Assessment Type	Marks	Scheme of Assessment
Lab work /Program Execution	40 marks	Two Internal Tests will be conducted and the average of the two will be considered
Observation/Record Notebook	5 marks	Assessment will be done during every practical class
Viva –Voce / Lab Quiz	5 marks	Two Lab Quiz Tests/viva-voce will be conducted and the average of the two will be considered

External Mark Distribution for Practical Courses

Assessment Type	Marks	Scheme of Assessment
Lab work/Program Execution	40 marks	End result of the Practical
Viva –Voce	10 marks	Oral Mode Test

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
QUESTION PAPER PATTERN

Internal Test – 30 Marks – 1 hr Duration

S.No	Type of Questions	Marks
1.	Objective type Questions: Multiple Choice – 4 questions Answer in a Word/Sentence – 4 questions	 04 04
2.	Short Answer–3 questions – either or type	3x4=12
3.	Long Answer–1 question – either or type	1x10=10

Summative Examinations – 60 Marks -3 hrs Duration

S.No	Type of Questions	Marks
1.	Objective type Questions: Multiple Choice – 5 questions Answer in a Word/Sentence – 5 questions	 05 05
2.	Short Answer – 5 questions – either or type	5x4=20
3.	Long Answer –3 questions – either or type	3x10=30

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics

Attainment of Course outcomes

Attainment of Course outcomes is computed using Direct and Indirect assessment methods. Direct Method of Assessment is based on performance of the students in the Continuous Internal Assessment Tests, Summative Examinations and supporting activities such as Seminar, Assignment, Case study, Group Discussion, Quiz, etc., and Indirect Method of Assessment is based on periodical feedback from the students at the end of each course.

Weightage of Direct and Indirect Assessment in computation of attainment of each course is 70% for Direct Assessment and 30% for Indirect Assessment.

Direct Assessment of Course outcome attainment

i) Rubrics:

Internal Assessment contributes 60% and Summative Examinations Assessment contributes 40% to the Direct Assessment of a course outcome for Theory Courses. For the Practical Courses, Internal Assessment contributes 70% and Summative Examinations Assessment contributes 30% to the Direct Assessment of a course outcome.

ii) Setting of Target:

50% of the maximum mark is set as target of Internal Assessment tools and the average mark of the class is set as target of Summative Examinations Assessment.

Formula for calculating percentage attainment of each course outcome

Based on the result of Summative Examinations and Internal Assessment tools, the number of students scoring more than the target is found out.

For each Internal Assessment Tools,

$$\text{Percentage attainment of each course outcome} = \frac{\text{No. of. Students who scored more than the target in the concerned course outcome}}{\text{Total Number of Students}} \times 100$$

$$\text{Percentage attainment of each Course outcome for Internal Assessment tools} = \text{Average of percentage attainment of all Internal Assessment tools}$$

For Summative Examinations,

$$\text{Percentage attainment of each Course outcome} = \frac{\text{No. of. Students who scored more than the target in the concerned co}}{\text{Total Number of Students}} \times 100$$

Formula for calculating Attainment Percentage of Course outcome of a course

Percentage Attainment of Course outcome for Internal Assessment tools	=	Average of percentage attainment of all COs
Percentage Attainment of Course outcome for Summative Examinations	=	Average of percentage attainment of all COs

Final Direct Assessment of Course outcome Attainment

For Theory Courses

Percentage Attainment of Course outcome through Direct Assessment	=	(0.6 x percentage attainment of CO for internal assessment tool) + (0.4 x percentage attainment of CO for summative examinations)

For Practical Courses

Percentage Attainment of Course outcome through Direct Assessment	=	0.7 x percentage attainment of CO for Internal Assessment tools + 0.3 x percentage attainment of CO for Summative Examinations

Indirect Assessment of CO Attainment

The course outcome feedback is conducted at the end of every semester by distributing structured feedback questionnaire to the students. The analysis of this feedback questionnaire is done on the following score. The feedback forms will be sorted with various scores and feedbacks with a score more than 5.5 are considered as satisfactory level for calculations for indirect attainment.

A : 10-8.5 **B :** 8.4-7.0 **C :** 6.9-5.5 **D :** 5.4-4.0 **E :** 3.9-0

$$\text{Percentage attainment for each CO} = \frac{\text{Satisfaction Number}}{\text{Response Received}} \times 100$$

Percentage Attainment of CO of a course = Average of percentage attainment of all COs

Final Assessment of CO attainment

Average course attainment = 0.7 x Direct assessment of CO attainment + 0.3 x Indirect assessment of CO attainment

Expected Level of Attainment for each of the Course Outcomes

CO	Level of Attainment
Above 70%	Excellent
60 -70 %	Very good
50-60 %	Good
40 – 50 %	Satisfactory
Below 40%	Not Satisfactory

Assessment of PO attainment

At the end of the each programme, the Direct PO Assessment is done from the CO Attainment of all courses. The Direct PO Attainment for a particular course is determined from the attainment values obtained for each course outcome related to that PO and the CO-PO mapping values.

$$\text{Weighted contribution of the course in attainment of each PO} = \frac{\text{Weighted Percentage of contribution of the course in attainmentof each PO}}{\text{average course attainment}} \times 100$$

Expected Level of Attainment for each of the Programme Outcomes

PO	Level of Attainment
Above 70%	Excellent
60 -70 %	Very good
50-60 %	Good
40 – 50 %	Satisfactory
Below 40%	Not Satisfactory

Attainment of Programme Educational Objectives (PEO)

PEOs are assessed after 3 to 4 years of graduation. Attainment is measured based on the Feedback from Stakeholders

1. Alumni
2. Parents
3. Employer

The analysis of this feedback questionnaire is done on the following score. The feedback forms will be sorted with various scores and feedbacks with a score more than 5.5 are considered as satisfactory level for calculations for Indirect Attainment.

A : 10-8.5 **B :** 8.4-7.0 **C :** 6.9-5.5 **D :** 5.4-4.0 **E :** 3.9-0

$$\text{Percentage attainment of PEOs} = \frac{\text{Satisfaction number}}{\text{Response Received}} \times 100$$

Expected Level of Attainment for each of the Programme Educational Objectives

PEO	Level of Attainment
Above 70%	Excellent
60 -70 %	Very good
50-60 %	Good
40 – 50 %	Satisfactory
Below 40%	Not Satisfactory

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UG Programme - B.Sc. Mathematics
CURRICULUM STRUCTURE
OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

S. No	Courses	Sem I	Sem II	Sem III	Sem IV	Sem V	Sem VI	Credits
I	Tamil / Hindi / French	6 (3)	6 (3)	6 (3)	6 (3)	-	-	12
II	English	6 (3)	6 (3)	6 (3)	6 (3)	-	-	12
III	Core Courses	4 (4) 4 (3)	4 (4) 4 (3)	4 (4) 4 (3)	4 (3) 4 (3)	5 (5) 5 (5) 5 (4) 5 (4)	5(5) 5(5) 5(5) 5(4) 4(3)	67
	Allied Courses	4 (4) 2P (1)	4 (4) 2P (1)	4 (4) 2P (1)	4 (4) 2P (1)	- -	- -	16 4
	Major Elective Courses	-	-	-		4(3) 4(3)	4(3)	9
	Self - paced Learning (Swayam Course)	-	-	-	(2)	-	-	2
IV	Ability Enhancement Compulsory Course AECC 1. Environmental Studies	2(1)	-	-	-	-	-	1
	2. Value Education	-	1(1)	-	-	-	-	1
	Non-Major Elective Courses	-	-	2 (1)	2 (1)	-	-	2
	Skill Enhancement Courses	2 (1)	2(2)	2 (2)	2(2)	2(2)	2 (2)	11
	Comprehensive Examination	-	-	-	-	-	(1)	1
	Disaster Management	-	1(1)	-	-	-	-	1
V	Extension	-	-	-	(1)	-	-	1
Total Hours /Credits (Per week)		30(20)	30(22)	30(21)	30(23)	30(26)	30(28)	140 180

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DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
CURRICULUM PATTERN
OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)
PROGRAMME CODE – UMA

Semester	Part	Course Code	Course Name	Hours	Credits
I	I	21UTAL11	Tamil / Hindi - I	6	3
	II	21UENL11	Communicative English - I	6	3
	III	21UMAC11	**Core Course - I :** Differential Calculus	4	4
		21UMAC12	**Core Course - II :** Analytical Geometry-3D	4	3
		21UMAA11	**Allied Course - I :** Physics I	4	4
		21UMAA1P	**Allied Course - I : Practical** - Physics I	2	1
	IV	21UESR11	**Ability Enhancement Compulsory Course - I:** Environmental Studies	2	1
		21UMAS11	**Skill Enhancement Course I :** Integral Calculus and Fourier Series	2	1
			Total	**30**	**20**
II	I	21UTAL21	Tamil / Hindi - II	6	3
	II	21UENL21	Communicative English - II	6	3
	III	21UMAC21	**Core Course - III :** Classical Algebra	4	4
		21UMAC22	**Core Course - IV :** Summation of Series and Trigonometry	4	3
		21UMAA21	**Allied Course - II :** Physics II	4	4
		21UMAA2P	**Allied Course - II : Practical** - Physics II	2	1
	IV	21UVED21	**Ability Enhancement Compulsory Course - II :** Value Education	1	1
		21UMAS21	**Skill Enhancement Course - II:** Data Interpretation	2	2
		21UDMG21	**Disaster Management**	1	1
			Total	**30**	**22**
III	I	21UTAL31	Tamil / Hindi – III	6	3
	II	21UENL31	Communicative English – III	6	3
	III	21UMAC31	**Core Course - V :** Sequences and Series	4	4
		21UMAC32	**Core Course - VI :** Mathematical Statistics	4	3
		21UMAA31	**Allied Course - III :** Programming in C and C++	4	4
		21UMAA3P	**Allied Course - III : Practical** - Programming in C and C++	2	1
	IV	21UMAN31	**Non Major Elective Course - I** : Fundamentals of Mathematics	2	1
		21UMAS31	**Skill Enhancement Course - III:** Astronomy	2	2
			Total	**30**	**21**
IV	I	21UTAL41	Tamil / Hindi – IV	6	3
	II	21UENL41	Communicative English – IV	6	3

	III	21UMAC41	**Core Course - VII :** Mechanics	4	3
		21UMAC42	**Core Course - VIII** : Sampling Theory	4	3
		21UMAA41	**Allied Course - IV :** Multimedia and its Applications	4	4
		21UMAA4P	**Allied Course - IV : Practical** - Multimedia and its Applications	2	1
		21UMAM41 21UMAM42	**Self-paced Learning** (Swayam Course) 1. Basic Calculus 1 and 2 2. Multivariable Calculus		2
	IV	21UMAN41	**Non Major Elective Course - II**: Introduction to Numerical Computations	2	1
		21UMAS41	**Skill Enhancement Course - IV:** Statistical Distributions	2	2
	V		**Extension**		1
			Total	**30**	**23**
V	III	21UMAC51	**Core Course - IX :** Abstract Algebra	5	5
		21UMAC52	**Core Course - X :** Real Analysis	5	5
		21UMAC53	**Core Course - XI :** Operations Research	5	4
		21UMAC54	**Core Course - XII :** Differential Equations and Laplace Transforms	5	4
		21UMAO51 21UMAO52 21UMAO53	**Major Elective Course - I :** 1. Numerical Methods 2. Calculus of Finite Differences 3. Probability Theory and Theory of Attributes	4	3
		21UMAO54 21UMAO55 21UMAO56	**Major Elective Course - II :** 1. Discrete Mathematics 2. Integral Transforms 3. Coding Theory	4	3
	IV	21UMAS5P	**Skill Enhancement Course - V: Practical** - HTML	2	2
			Total	**30**	**26**
VI	III	21UMAC61	**Core Course - XIII :** Linear Algebra	5	5
		21UMAC62	**Core Course - XIV :** Complex Analysis	5	5
		21UMAC63	**Core Course - XV :** Graph Theory	5	5
		21UMAC64	**Core Course - XVI :** Vector Calculus	5	4
		21UMAJ61	**Core Course - XVII :** Project	4	3
		21UMAO61 21UMAO62 21UMAO63	**Major Elective Course - III :** 1. Resource Management Techniques 2. Project Network Techniques 3. Mathematical Programming Techniques	4	3
	IV	21UMAS6P	**Skill Enhancement Course - VI: Practical** – Computational Methods in Octave	2	2
		21UMAE61	**Comprehensive Examination**	-	1
			Total	**30**	**28**

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UG Programme - B.Sc. Mathematics
OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

PROGRAMME ARTICULATION MATRIX (PAM)

Semester	Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7
I	21UTAL11	Tamil / Hindi – I	10	7	2	8	2	2	2
	21UENL11	Communicative English – I	10	7	2	8	2	2	3
	21UMAC11	**Core Course - I :** Differential Calculus	15	12	4	10	0	4	3
	21UMAC12	**Core Course - II :** Analytical Geometry-3D	15	12	5	9	0	3	3
	21UMAA11	**Allied Course - I :** Physics I	13	11	5	6	1	5	3
	21UMAA1P	**Allied Course - I : Practical -** Physics I	10	11	5	4	3	6	3
	21UESR11	**Ability Enhancement Compulsory Course –I:** Environmental Studies	8	5	1	7	8	5	5
	21UMAS11	**Skill Enhancement Course I :** Integral Calculus and Fourier Series	14	10	3	10	0	4	2
II	21UTAL21	Tamil / Hindi – II	10	8	2	8	2	2	2
	21UENL21	Communicative English – II	10	8	2	8	2	2	3
	21UMAC21	**Core Course - III :** Classical Algebra	15	13	5	8	0	3	3
	21UMAC22	**Core Course - IV :** Summation of Series and Trigonometry	15	12	4	8	0	3	3
	21UMAA21	**Allied Course - II :** Physics II	13	11	5	6	1	5	3
	21UMAA2P	**Allied Course - II : Practical -** Physics II	10	11	5	4	3	6	3
	21UVED21	**Ability Enhancement Compulsory Course – II :** Value Education	8	5	1	5	9	4	7
	21UMAS21	**Skill Enhancement Course - II:** Data Interpretation	9	8	3	7	3	6	4
	21UDMG21	**Disaster Management**	7	8	2	5	2	4	8
III	21UTAL31	Tamil / Hindi– III	10	8	2	8	2	2	2
	21UENL31	Communicative English – III	10	8	3	9	3	3	2
	21UMAC31	**Core Course - V :** Sequences and Series	15	13	5	10	0	2	2
	21UMAC32	**Core Course - VI :** Mathematical Statistics	15	12	4	8	4	6	2
	21UMAA31	**Allied Course - III :** Programming in C and C++	11	11	4	8	4	6	4

	21UMAA3P	**Allied Course - III : Practical** - Programming in C and C++	10	10	5	5	3	10	4
	21UMAN31	**Non Major Elective Course - I** : Fundamentals of Mathematics	9	5	0	8	0	5	5
	21UMAS31	**Skill Enhancement Course - III:** Astronomy	13	8	3	10	0	4	3
IV	21UTAL41	Tamil / Hindi – IV	10	8	2	9	2	2	2
	21UENL41	Communicative English – IV	10	9	3	8	2	3	3
	21UMAC41	**Core Course - VII :** Mechanics	15	12	4	10	0	4	3
	21UMAC42	**Core Course - VIII** : Sampling Theory	15	12	2	8	4	6	2
	21UMAA41	**Allied Course - IV :** Multimedia and its Applications	10	10	0	10	3	10	3
	21UMAA4P	**Allied Course - IV : Practical** - Multimedia and its Applications	8	10	0	10	4	10	3
	21UMAM41 21UMAM42	**Self-paced Learning** (Swayam Course) 1. Basic Calculus 1 and 2 2. Multivariable Calculus	13	10	5	9	1	2	7
	21UMAN41	**Non Major Elective Course - II**: Introduction to Numerical Computations	9	5	0	8	0	5	5
	21UMAS41	**Skill Enhancement Course - IV:** Statistical Distributions	10	12	2	8	4	4	2
		Extension	8	2	1	7	9	8	5
V	21UMAC51	**Core Course - IX :** Abstract Algebra	15	10	6	10	0	4	2
	21UMAC52	**Core Course - X :** Real Analysis	15	10	6	8	0	3	2
	21UMAC53	**Core Course - XI :** Operations Research	15	11	6	7	0	4	2
	21UMAC54	**Core Course - XII :** Differential Equations and Laplace Transforms	15	14	6	5	0	4	4
	21UMAO51 21UMAO52 21UMAO53	**Major Elective Course - I :** 1. Numerical Methods 2. Calculus of Finite Differences 3. Probability Theory and Theory of Attributes	15	12	6	5	0	7	4
	21UMAO54 21UMAO55 21UMAO56	**Major Elective Course - II :** 1. Discrete Mathematics 2. Integral Transforms 3. Coding Theory	15	10	9	5	0	4	2
	21UMAS5P	**Skill Enhancement Course - V: Practical** - HTML	9	9	0	8	4	5	3
VI	21UMAC61	**Core Course - XIII :** Linear Algebra	15	12	6	8	0	6	3
	21UMAC62	**Core Course - XIV :** Complex Analysis	15	10	6	9	0	3	3
	21UMAC63	**Core Course - XV :** Graph Theory	15	13	6	8	2	3	3
	21UMAC64	**Core Course - XVI :** Vector Calculus	15	13	6	9	0	2	2
	21UMAJ61	**Core Course - XVII :** Project	10	10	10	7	4	5	5
		Major Elective Course - III :	15	11	5	7	2	4	2

	21UMAO61 21UMAO62 21UMAO63	1. Resource Management Techniques 2. Project Network Techniques 3. Mathematical Programming Techniques							
	21UMAS6P	**Skill Enhancement Course - VI: Practical** – Computational Methods in Octave	12	7	4	10	0	6	2
	21UMAE61	**Comprehensive Examination**	10	10	5	10	1	7	7
Total Weightage of all Courses Contributing to PO			**599**	**486**	**188**	**390**	**96**	**225**	**165**

SRI KALISWARI COLLEGE (AUTONOMOUS), Sivakasi
(Affiliated to Madurai Kamaraj University, Re-accredited with A Grade (CGPA 3.11) by NAAC)
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

PROGRAMME ARTICULATION MATRIX – WEIGHTED PERCENTAGE

Semester	Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7
I	21UTAL11	Tamil / Hindi – I	1.67	1.44	1.06	2.05	2.08	0.89	1.21
	21UENL11	Communicative English – I	1.67	1.44	1.06	2.05	2.08	0.89	1.82
	21UMAC11	**Core Course - I :** Differential Calculus	2.5	2.47	2.13	2.56	0	1.78	1.82
	21UMAC12	**Core Course - II :** Analytical Geometry-3D	2.5	2.47	2.66	2.31	0	1.33	1.82
	21UMAA11	**Allied Course - I :** Physics I	2.17	2.26	2.66	1.54	1.04	2.22	1.82
	21UMAA1P	**Allied Course - I : Practical -** Physics I	1.67	2.26	2.66	1.03	3.13	2.67	1.82
	21UESR11	**Ability Enhancement Compulsory Course –I:** Environmental Studies	1.34	1.03	0.53	1.79	8.33	2.22	3.03
	21UMAS11	**Skill Enhancement Course I :** Integral Calculus and Fourier Series	2.34	2.06	1.6	2.56	0	1.78	1.21
II	21UTAL21	Tamil / Hindi – II	1.67	1.65	1.06	2.05	2.08	0.89	1.21
	21UENL21	Communicative English – II	1.67	1.65	1.06	2.05	2.08	0.89	1.82
	21UMAC21	**Core Course - III :** Classical Algebra	2.5	2.67	2.66	2.05	0	1.33	1.82
	21UMAC22	**Core Course - IV :** Summation of Series and Trigonometry	2.5	2.47	2.13	2.05	0	1.33	1.82
	21UMAA21	**Allied Course - II :** Physics II	2.17	2.26	2.66	1.54	1.04	2.22	1.82
	21UMAA2P	**Allied Course - II : Practical -** Physics II	1.67	2.26	2.66	1.03	3.13	2.67	1.82
	21UVED21	**Ability Enhancement Compulsory Course – II :** Value Education	1.34	1.03	0.53	1.28	9.38	1.78	4.24
	21UMAS21	**Skill Enhancement Course - II:** Data Interpretation	1.5	1.65	1.6	1.79	3.13	2.67	2.42
	21UDMG21	**Disaster Management**	1.17	1.65	1.06	1.28	2.08	1.78	4.85
III	21UTAL31	Tamil / Hindi– III	1.67	1.65	1.06	2.05	2.08	0.89	1.21
	21UENL31	Communicative English – III	1.67	1.65	1.6	2.31	3.13	1.33	1.21
	21UMAC31	**Core Course - V :** Sequences and Series	2.5	2.67	2.66	2.56	0	0.89	1.21
	21UMAC32	**Core Course - VI :** Mathematical Statistics	2.5	2.47	2.13	2.05	4.17	2.67	1.21
	21UMAA31	**Allied Course - III :** Programming in C and C++	1.84	2.26	2.13	2.05	4.17	2.67	2.42

	21UMAA3P	**Allied Course - III : Practical** - Programming in C and C++	1.67	2.06	2.66	1.28	3.13	4.44	2.42
	21UMAN31	**Non Major Elective Course - I** : Fundamentals of Mathematics	1.5	1.03	0	2.05	0	2.22	3.03
	21UMAS31	**Skill Enhancement Course - III:** Astronomy	2.17	1.65	1.6	2.56	0	1.78	1.82
IV	21UTAL41	Tamil / Hindi – IV	1.67	1.65	1.06	2.31	2.08	0.89	1.21
	21UENL41	Communicative English – IV	1.67	1.85	1.6	2.05	2.08	1.33	1.82
	21UMAC41	**Core Course - VII :** Mechanics	2.5	2.47	2.13	2.56	0	1.78	1.82
	21UMAC42	**Core Course - VIII** : Sampling Theory	2.5	2.47	1.06	2.05	4.17	2.67	1.21
	21UMAA41	**Allied Course - IV :** Multimedia and its Applications	1.67	2.06	0	2.56	3.13	4.44	1.82
	21UMAA4P	**Allied Course - IV : Practical** - Multimedia and its Applications	1.34	2.06	0	2.56	4.17	4.44	1.82
	21UMAM41 21UMAM42	**Self-paced Learning** (Swayam Course) 1. Basic Calculus 1 and 2 2. Multivariable Calculus	2.17	2.06	2.66	2.31	1.04	0.89	4.24
	21UMAN41	**Non Major Elective Course - II**: Introduction to Numerical Computations	1.5	1.03	0	2.05	0	2.22	3.03
	21UMAS41	**Skill Enhancement Course - IV:** Statistical Distributions	1.67	2.47	1.06	2.05	4.17	1.78	1.21
		Extension	1.34	0.41	0.53	1.79	9.38	3.56	3.03
V	21UMAC51	**Core Course - IX :** Abstract Algebra	2.5	2.06	3.19	2.56	0	1.78	1.21
	21UMAC52	**Core Course - X :** Real Analysis	2.5	2.06	3.19	2.05	0	1.33	1.21
	21UMAC53	**Core Course - XI :** Operations Research	2.5	2.26	3.19	1.79	0	1.78	1.21
	21UMAC54	**Core Course - XII :** Differential Equations and Laplace Transforms	2.5	2.88	3.19	1.28	0	1.78	2.42
	21UMAO51 21UMAO52 21UMAO53	**Major Elective Course - I :** 1. Numerical Methods 2. Calculus of Finite Differences 3. Probability Theory and Theory of Attributes	2.5	2.47	3.19	1.28	0	3.11	2.42
	21UMAO54 21UMAO55 21UMAO56	**Major Elective Course - II :** 1. Discrete Mathematics 2. Integral Transforms 3. Coding Theory	2.5	2.06	4.79	1.28	0	1.78	1.21
	21UMAS5P	**Skill Enhancement Course - V: Practical** - HTML	1.5	1.85	0	2.05	4.17	2.22	1.82
VI	21UMAC61	**Core Course - XIII :** Linear Algebra	2.5	2.47	3.19	2.05	0	2.67	1.82
	21UMAC62	**Core Course - XIV :** Complex Analysis	2.5	2.06	3.19	2.31	0	1.33	1.82
	21UMAC63	**Core Course - XV :** Graph Theory	2.5	2.67	3.19	2.05	2.08	1.33	1.82
	21UMAC64	**Core Course - XVI :** Vector Calculus	2.5	2.67	3.19	2.31	0	0.89	1.21
	21UMAJ61	**Core Course - XVII :** Project	1.67	2.06	5.32	1.79	4.17	2.22	3.03
		Major Elective Course - III :	2.5	2.26	2.66	1.79	2.08	1.78	1.21

	21UMAO61 21UMAO62 21UMAO63	1. Resource Management Techniques 2. Project Network Techniques 3. Mathematical Programming Techniques							
	21UMAS6P	**Skill Enhancement Course - VI: Practical** – Computational Methods in Octave	2	1.44	2.13	2.56	0	2.67	1.21
	21UMAE61	**Comprehensive Examination**	1.67	2.06	2.66	2.56	1.04	3.11	4.24
Total Weightage Percentage of Course Contribution to Pos			**100**	**100**	**100**	**100**	**100**	**100**	**100**

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF TAMIL
UG Programme - B.A./B.SC./BCA
SEMESTER - I
பொதுத்தமிழ் - I (21UTAL11)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6	**INT.MARKS : 40**
CREDITS : 3	**EXT.MARKS : 60**
DURATION : 90 hrs	**MAX.MARKS : 100**

நோக்கம்

தற்கால இலக்கியவகைமைகளை அறிமுகப்படுத்தும் நோக்கில் இத்தாள் வடிவமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளை வெற்றிகரமாக முடித்தவுடன் மாணவர்கள்,

CO1[K1]: நவீன இலக்கிய வகைமைகளை அடையாளம் காண்பர்.

CO2[K2]: மொழி இலக்கண அறிவினைப் புரிந்துகொண்டுபிழை இன்றிஎழுதும் திறன்பெறுவர்.

CO3[K3]: இக்கால இலக்கியங்களின் கருத்தம்சங்களை தம் வாழ்நிலையோடு பொருத்திப்பார்ப்பர்.

CO4[K5]: நவீன இலக்கியங்கள் படைப்பதற்கு அடிப்படையாக அமைந்த முறைமை குறித்து மதிப்பீடு செய்து அவற்றை விமர்சிப்பர்.

CO5[K6]: உலகளாவிய கவிதை நாடகப் படைப்புகளைக் கற்றுப் படைப்பர்.

CO-PO Mapping Table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	-	2	-	-	-
CO2[K2]	2	2	-	2	-	-	-
CO3[K3]	2	1	-	2	1	-	-
CO4[K5]	2	1	1	1	1	1	1
CO5[K6]	2	1	1	1	-	1	1
Weightage of the course	10	7	2	8	2	2	2
Weighted percentage of Course Contribution to POs	1.67	1.44	1.06	2.05	2.08	0.89	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

கூறு I **(18hrs)**

மரபுக்கவிதை: மரபுக்கவிதையின் தோற்றமும் வளர்ச்சியும், **பாரதியார்**: யாமறிந்தமொழிகளிலே, பகைவனுக்கு அருள்வாய்.**பாரதிதாசன்**:வீரத் தமிழன் இதொழிலாளர் விண்ணப்பம்.**கவிமணி**:ஒற்றுமையே உயிர்நிலை. **நாமக்கல்கவிஞர்:** பெண்மனம்.

முடியரசன்:தமிழ்தான்என்பேர்.**கண்ணதாசன்:**யாத்திரை.**பட்டுக்கோட்டை:**சின்னப்பயலே.....

கூறுII **(18hrs)**

புதுக்கவிதை: புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் - ஹைக்கூவின் தோற்றமும் வளர்ச்சியும்.**அப்துல்ரகுமான் :** பாருக்குள்ளேநல்லநாடு. **நா.காமராசர்:**கண். **மு.மேத்தா:**கால்களால் நடந்தகதை.**வைரமுத்து:**ஐந்துபெரிது ஆறு சிறிதுஇ **பா.விஜய்:**பேனாபேசுச்சு. **கனிமொழி**:கருவறைவாசனை. **ஹைக்கூ கவிதை:** இ.பரிமளம் - அமுதபாரதி - பா.உதயகண்ணன் - இ.ரா.இரவி - மணிவேலன் -புதுவைசீனு.தமிழ்மணி- புதுவைத்தமிழ்நெஞ்சன் - அறிவுமதி- ஸ்ரீரசா-தங்கம் மூர்த்தி - புதுக்கவிதை - ஹைக்கூ படைப்பதற்குப் பயிற்சிஅளித்தல்.

கூறு III **(18hrs)**

நாடகம்:நாடகத்தின் தோற்றமும் வளர்ச்சியும்,புராஇலக்கியநாடகங்கள்- **ஜெயந்திநாகராஜன்:**திருநாவுக்கரசர் - திருஞானசம்பந்தர்.

கூறு IV **(18hrs)**

நாடகம்:புராண இலக்கியநாடகங்கள் - ஜெயந்திநாகராஜன்1.மாணிக்கவாசகர் 2.கண்ணப்பநாயனார் 3. மெய்ப்பொருள் நாயனார்,நாடகம் படைப்பதற்குப்பயிற்சிஅளித்தல்.

கூறு V **(18hrs)**

இலக்கணம் : முதல்இ சார்பெழுத்துக்கள் - மொழி முதல்இ மொழி இறுதிஎழுத்துக்கள் - வல்லினம் மிகும்இ மிகா இடங்கள;.

பாடநூல்கள்

1. *தொகுப்பு நூல்*,தமிழியல்துறை,ஸ்ரீ காளீஸ்வரிகல்லூரி (தன்னாட்சி),சிவகாசி.
2. ஜெயந்திநாகராஜன்.*புராணஇலக்கியநாடகங்கள்*,தாமரைபப்ளிகே'ன்ஸ், சென்னை, 2014.
3. வாசுதேவன்,கா.*பன்முகநோக்கில்தமிழ்இலக்கியவரலாறு*,தேவன்பதிப்பகம், திருச்சிராப்பள்ளி, 2017.

பார்வை நூல்கள்

1. சுதந்திரமுத்து, மு.*படைப்புக் கலை*,அறிவுப் பதிப்பகம்,சென்னை,2008.
2. பாக்கியமேரி.*தமிழ் இலக்கியவரலாறு*,நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை,2011.
3. ஸ்ரீதரன்,என்.*பிழையின்றித் தமிழ் எழுதுவோம்,* ஸ்ரீநந்தினிபதிப்பகம்,சென்னை, 2008.

வலைப்பதிவுகள்(Web Sources)

1. https://youtu.be/6mrdbprILo8
2. https://youtu.be/QYizo6YwBXl
3. https://youtu.be/-oUmlDvHvQg
4. https://youtu.be/3sY76BTiqPQ
5. https://youtu.be/xLosPsqJ6W0

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme -B.A./B.Com./B.B.A./B.SC./BCA
SEMESTER- I
COMMUNICATIVE ENGLISH - I (21UENL11)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS: 100**

Preamble

This course helps the learners to develop their communication skills inEnglish through listening, speaking, reading, and writing practices.

Course Outcomes (CO)

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

CO1[K1]: relate and state ideas by reading and listening to simple recorded conversations and fables

CO2[K2]: demonstrate communicative skills through simple Descriptions,Requests and Instructions

CO3[K3]: apply knowledge of word power and grammar rules in Formal andInformal letter writings

CO4[K4]: analyze fairy tales and folk tales to develop language skills throughliterature

CO5[K6]: construct grammatically correct and meaningful simple sentences inEnglish

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	-	2	-	-	-
CO2[K2]	2	2	-	2	-	-	-
CO3[K3]	2	1	-	2	1	-	1
CO4[K4]	2	1	1	1	1	1	1
CO5[K6]	2	1	1	1	-	1	1
Weightage of the course	10	07	02	08	02	02	03
Weighted percentage of Course contribution to Pos	1.67	1.44	1.06	2.05	2.08	0.89	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I - LISTENING AND SPEAKING **(18 hrs)**

A. Listening

Listening to simple conversations in everyday contexts
Listening to fables
Listening to News Bulletin

B. Speaking

Introducing oneself and others
Describing persons, places, things, daily routines, health and symptoms
Asking for time and date
Asking for directions and giving directions
Giving instructions and seeking clarifications
Making requests and responding to requests
Thanking someone and responding to thanks

UNIT II - READING AND WRITING **(18 hrs)**

A. Reading

Interpreting pictures/maps/pie-charts/tables/flow charts /diagrams
Skimming or scanning through the texts

B. Writing

Hints Developing
Story Completion/ completing the story based on given outline.
Letter Writing: Informal letters- Family, Friends and Relatives
Formal letters: Leave letters and Apology Letter

UNIT III - WORD POWER **18 hrs)**

Prefixes and Suffixes
Homophones and Homonyms
Words related to Parts of the Body & their functions, Cries of Animals, Young Ones of Animals
Connotative and Denotative words
Contextual Usage of words
Puzzles and Anagrams

UNIT IV - GRAMMAR **(18 hrs)**

Nouns-Kinds, Number and Gender
Pronouns-Kinds
Adjectives- Kinds
Verbs-Regular and Irregular verbs, Transitive and Intransitive Verbs
Adverbs- Kinds and Position of Adverbs

UNIT V - LANGUAGE THROUGH LITERATURE (18 hrs)

Fairy Tales, Folk Tales and Legendary Heroes

Fairy Tales

The Pied Piper of Hamelin

The Ugly Duckling

Hansel and Gretel

Folk Tales

Alibaba and the Forty Thieves

Aladdin and the Magic Lamp

The Town Mouse and the Country Mouse

Legendary Heroes

Chhatrapati Shivaji Maharaj- Shivaji's great escape

Mahatma Gandhi- Mohandas takes a spelling test

Tenali Raman- The Stolen Brinjal

Akbar and Birbal- Re-Union

TEXTBOOKS

1. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
2. Pillai, Radhakrishna, and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.
3. Sreelekshmi. *Folk Tales- A WonderWorld of 150 Stories for Children*. Kerala: SL Publishers, 2004.

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1. Babu, Sundara. *Leo's Tenali Raman Stories*. Chennai: Leo Book Publishers, 2015.
2. Kalyani V. *Fairy Tales 1*. Kerala: Sisco Publishers, 2004.
3. *Life Skills* (Jeevan Kaushal) *Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
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5. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.

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2. https://kathakids.com/great-personalities/stories-of-mahatma-gandhi/
3. https://www.infoplease.com/dictionary/brewers/animals-cries
4. https://www.zooborns.com/zooborns/baby-animal-names.html
5. https://learnenglish.britishcouncil.org/general-english/stories
6. https://www.talkenglish.com/lessonindex.aspx
7. https://www.englishhelper.com/
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - I
CORE COURSE - I: DIFFERENTIAL CALCULUS (21UMAC11)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the geometrical applications of differentiation.

Course Outcomes (CO)

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

CO1[K2]: describe tangent, normal, pedal equation of plane curves with the help of derivative

CO2[K2]: exemplify curvature, radius of curvature, evolute of plane curves and envelope of a family of plane curves encountered in the study of calculus

CO3[K3]: sketch a plane curve given its equation without computing the large number of points required for a detailed plot

CO4[K4]: investigate homogeneous function and Euler's theorem

CO5[K5]: determine the asymptotes of the given function

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	1	-	2	-	-	-
CO2[K2]	3	2	1	2	-	-	-
CO3[K3]	3	3	1	2	-	2	1
CO4[K4]	3	3	1	2	-	1	1
CO5[K5]	3	3	1	2	-	1	1
Weightage of the course	15	12	04	10	-	04	03
Weighted percentage of Course contribution to POs	2.5	2.47	2.13	2.56	0	1.78	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(12 hrs)**

Differentiation: Leibnitz's Theorem – Partial Differentiation – Homogeneous Function and Euler's Theorem.

UNIT II **(12 hrs)**

Applications of Differentiation: Introduction –Tangent, Normal, Subtangent, Subnormal – Polar Curves – Pedal Equation of a Curve (p - r Equation).

UNIT III **(12 hrs)**

Curvature – Evolutes – Envelopes – Jacobians.

UNIT IV **(12 hrs)**

Asymptotes – Methods of Finding Asymptotes for the Curve $y = f(x)$ – Method of Finding Asymptotes for the Curve $f(x, y) = 0$ – Asymptotes Parallel to the Axes for an Algebraic Curve $f(x, y) = 0$ of Degree n.

UNIT V **(12 hrs)**

Curve Tracing – Tracing of curves $f(x, y) = 0$ (Cartesian coordinates) – Tracing a curve $f(r, \theta) = 0$ (Polar coordinates) – Tracing a curve $x = f(t)$, $y = g(t)$ (Parametric Equations).

TEXTBOOK

1. Arumugam, S. and Thangapandi Isaac, A. *Calculus*. Palayamkottai: New Gamma Publishing House, 2014.

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1. Narayanan, S. and Manickavachagam Pillai, T.K. *Calculus Volume I*. S.Viswanathan (Printers and Publishers) Pvt. Ltd, 2006.
2. Shanti Narayanan. *Differential Calculus*. New Delhi: S.Chand & Company Ltd., 2004.
3. Vital, P.R. and Malini, V. *Calculus*. Chennai: Margham publications, 2006.

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1. https://byjus.com/radius-of-curvature-formula/
2. https://theengineeringmaths.com/wp-content/uploads/2017/09/new-Chapter-4-Asymptotes-2.pdf
3. https://theengineeringmaths.com/wp-content/uploads/2017/08/Chapter-1-Successive-Differentiation-.pdf
4. https://www.youtube.com/watch?v=_WcPtsuMMz0
5. https://www.youtube.com/watch?v=btLWNJdHzSQ

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - I
CORE COURSE - II: ANALYTICAL GEOMETRY - 3D (21UMAC12)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the algebraic methods to study the geometric objects that lie in three - dimensional spaces.

Course Outcomes (CO)

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

CO1[K1]: describe three – dimensional Cartesian co-ordinates and geometric objects line, plane, sphere on the co-ordinate system

CO2[K2]: explain the properties of direction cosines of a line

CO3[K3]: manipulate the different forms of equations of lines, planes, spheres

CO4[K4]: differentiate the different forms of equations of lines, planes, spheres

CO5[K5]: determine the appropriate form of equation of lines, planes, spheres under precondition of correspondence between the geometric objects and its equations

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	1	-	1	-	-	-
CO2[K2]	3	2	1	1	-	-	-
CO3[K3]	3	3	1	2	-	1	1
CO4[K4]	3	3	1	2	-	1	1
CO5[K5]	3	3	2	3	-	1	1
Weightage of the course	15	12	05	09	-	03	03
Weighted percentage of Course contribution to POs	2.5	2.47	2.66	2.31	0	1.33	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Rectangular Cartesian Coordinates: Direction Cosines of a Line: Coordinates – Distance Between Points – The Coordinates of the Point Dividing the Line Joining the Points$P(x_1, y_1, z_1)$ and $Q(x_2, y_2, z_2)$ in the Ratio m:n – The Centroid of a Triangle when the Coordinates of the Vertices of the Triangle Are Known – Angle Between Two Lines – Projections – Direction Cosines – Direction Ratios – The Projection of the Line Joining $P(x_1, y_1, z_1)$ and $Q(x_2, y_2, z_2)$ on any Other Line with Direction Cosines l, m, n – Direction Cosines of the Line Joining the Points $P(x_1, y_1, z_1)$ and $Q(x_2, y_2, z_2)$ – Angle Between the Lines whose Direction Cosines are (l_1, m_1, n_1) and (l_2, m_2, n_2) – Conditions for Perpendicularity and Parallelism.

UNIT II **(12 hrs)**

The Plane: The General Equation of the First Degree in x, y, z Represents a Plane – The Equation of the Plane Making Intercepts a, b, c on the Axes OX, OY, OZ respectively – The Equation of a Plane in terms of p, the Length of the Perpendicular From the Origin to It and l, m, n the Direction Cosines of that Perpendicular – Several Forms for the Equations of a Plane – The Equation of the Plane Passing through the Points (x_1, y_1, z_1), (x_2, y_2, z_2) and (x_3, y_3, z_3) – Direction Cosines of the Line which is Perpendicular to a Plane – Angle Between the Planes $a_1x + b_1y + c_1z + d_1 = 0$ and $a_2x + b_2y + c_2z + d_2 = 0$ – The Ratio in which the Plane $ax + by + cz + d = 0$ Divides the Line Joining the Points (x_1, y_1, z_1), (x_2, y_2, z_2) – Equation of a Plane through the Line of Intersection of Two Given Planes – Length of Perpendicular – The Equation of the Planes Bisecting the Angle Between the Planes $a_1x + b_1y + c_1z + d_1 = 0$ and $a_2x + b_2y + c_2z + d_2 = 0$.

UNIT III **(12 hrs)**

The Straight Line: A Straight Line may be Determined as the Intersection of Two Planes – Symmetrical Form of the Equations of a Line – The Symmetrical Form of the Equations of the Line $ax + by + cz + d = 0 = a_1x + b_1y + c_1z + d_1$ – Equation of a Straight Line Passing through Two Given Points – The Condition for the Line $\frac{x-x1}{l} = \frac{y-y1}{m} = \frac{z-z1}{k}$ to be Parallel to the Plane $ax + by + cz + d = 0$ – Angle Between the Plane $ax + by + cz + d = 0$ and the Line $\frac{x-x_1}{l} = \frac{y-y_1}{m} = \frac{z-z_1}{n}$ – The Condition that the Two Given Straight Lines should be Coplanar.

UNIT IV **(12 hrs)**

The Shortest Distance Between Two Given Lines – Interpretations of Equations. Loci. – The Intersection of Three Planes – The Volume of a Tetrahedron in terms of the Coordinates of its Vertices.

UNIT V **(12 hrs)**

The Sphere: Definition – The Equation of a Sphere when the Centre and Radius Are Given – The Equation $x^2 + y^2 + z^2 + 2ux + 2vy + 2wz + d = 0$ 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 $x^2 + y^2 + z^2 + 2ux + 2vy + 2wz + d$

= 0 – The Plane Section of a Sphere is a Circle – Equation of a Circle on a Sphere – Intersection of Two Spheres is a Circle – The Equation of the Tangent Plane to the Sphere $x^2 + y^2 + z^2 + 2ux + 2vy + 2wz + d = 0$ at Point (x_1, y_1, z_1).

TEXTBOOK

1. ManicavachagomPillay, T.K. and Natarajan, T. *A Text Book of Analytical Geometry 3Dimension*. Chennai: S.Viswanathan(Printers and Publishers), Pvt., Ltd, 2012.

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Books

1. Arumugam, S. and Thangapandi Issac, A. *Analytical Geometry 3D, Vector Calculus & Trigonometry*. Palayamkottai: New Gamma Publishing House, 2006.
2. ArupMukherjee and Naba Kumar Bej. *Analytical Geometry of Two &Three Dimensions*. Kolkatta: Books and Allied (P) Ltd., 2015.
3. Duraipandian, P. LaxmiDuraipandian and Muhilan, D. *Analytical Geometry 3-Dimensional*. Chennai: Emerald Publishers, 2000.

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2. https://viden.io/knowledge/mathematics-analytical-geometry-3d-and-vector-calculus
3. https://www.google.com/url?sa=t&source=web&rct=j&url=https://ncert.nic.in/ncerts/l/lemh205.pdf&ved=2ahUKEwjq5p7Ph9rvAhWrH7cAHc7CARE4CAWMAR6BAgBEAI&usg=AOvVaw3tnTk9ZYCHF1w3_uoEK_nS
4. https://www.google.com/url?sa=t&source=web&rct=j&url=https://m.youtube.com/watch%3Fv%3Da2mt2L0e06Y&ved=2ahUKEwjCxqikiNrvAhVX6nMBHY83BI44ChC3AnoECAUQAg&usg=AOvVaw2uPxp81-3IIbcQB8F0yNV7
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Mathematics
SEMESTER - I
ALLIED COURSE - I: PHYSICS - I (21UMAA11)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:4**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basic concepts of strength of materials, viscous properties of liquids, modes of heat transmission, geometrical and physical optics.

Course Outcomes (CO)

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

CO1[K1]: outline the basic concepts of properties of matter, heat transmission, geometrical and physical optics

CO2[K2]: explain the basic concepts of properties of matter, heat transmission, geometrical and physical optics

CO3[K3]: choose appropriate formulae to solve problems

CO4[K4]: analyze the physical and optical parameters of materials

CO5[K4]: examine the physical and optical parameters of materials

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	1	-	2	-	1	-
CO3 [K3]	3	3	1	1	-	1	1
CO4 [K4]	2	3	2	1	-	1	1
CO5 [K4]	2	3	2	1	1	1	1
Weightage of the course	13	11	5	6	1	5	3
Weighted percentage of Course contribution to POs	2.17	2.26	2.66	1.54	1.04	2.22	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I – ELASTICITY **(12 hrs)**

Elasticity – Different Moduli of Elasticity – Torsion of a Body – Work Done in Twisting a Wire – Torsional Oscillations of a Body – Rigidity Modulus by Dynamic Torsion Method (Torsional Pendulum) – Bending of Beams – Expression for Bending Moment – Depression at the Mid-Point of a Beam Loaded at the Middle – Uniform Bending of a Beam – Determination of Young's Modulus.

UNIT II – VISCOSITY **(12 hrs)**

Viscosity – Streamline Flow and Turbulent Flow – Poiseuille's Formula for the Flow of a Liquid Through a Capillary Tube – Poiseuille's Method for Determination of Coefficient of Viscosity of a Liquid (Constant and Variable Pressure Head) – Ostwald Viscometer – Terminal Velocity and Stoke's Formula – Stoke's Method for the Coefficient of Viscosity – Friction and Lubrication.

UNIT III – TRANSMISSION OF HEAT **(12 hrs)**

Conduction – Coefficient of Thermal Conductivity – Forbe's Method – Lee's Disc Method for Bad Conductors – Convection – Central Heating System – Thermopile – Thermos Flask – Radiation – Black Body in Practice – Kirchhoff's Law – Stefan-Boltzmann Law – Distribution Energy in Black Body Spectrum – Planck's Radiation Law (No Derivation) – Solar Constant – Temperature of the Sun – Water Flow Pyroheliometer.

UNIT IV – GEOMENTRICAL OPTICS **(12 hrs)**

Cardinal Points of an Optical System – Graphical Construction of Image using Cardinal Points – Newton's Formula – Cardinal Points of a Coaxial System of Two Thin Lenses. Angular and Chromatic Dispersion of a Prism – Achromatic Combination of Prism – Deviation without Dispersion – Dispersion without Deviation – Direct Vision Spectroscope – Aberration – Spherical and Chromatic Aberrations in Lenses.

UNIT V – PHYSICAL OPTICS **(12 hrs)**

Interference in a Wedge-Shaped Film – Air Wedge – Newton's Rings – Theory and Experiment. Types of Polarization – Double Refraction – Nicol Prism – Optical Activity – Biot's Laws for Rotatory Polarisation – Specific Rotation – Laurent's Half Shade Polarimeter – Determination of Specific Rotation of Sugar Solution. Resolving Power – Rayleigh's Criterion for Resolution – Limit of Resolution of the Eye – Resolving Power of a Microscope.

TEXTBOOKS

1. Murugesan R. *Properties of Matter*. New Delhi: S.Chand & Co., Fifth Eidtion, 2020. **(UNITS I & II)**

2. Brij lal, Subramanyam N and Hemne P.S. *Heat Thermodynamics and Statistical Physics*. New Delhi : S.Chand & Company Ltd., Revised Edition, Reprint 2020. **(UNIT III)**
3. Subraminyam N, Brij lal and Avadhanulu M.N. *A Textbook of Optics.* New Delhi : S.Chand & Company Ltd., Twenty Fifth Revised Edition, Reprint 2018. **(UNITS IV & V)**

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1. Mathur D.S. *Elements of Properties of Matter*. New Delhi : Chand & Company Ltd., Revised Edition, 2007.
2. Mathur D.S and Bapat M.N. *Heat and Thermodynamics*. New Delhi : Sultan Chand & Sons, Fifth Edition, Reprint 2014.
3. Kakani S.L, and Bhandari K.C. *A Textbook of Optics. New Delhi* : Sultan Chand & Sons, Second Edition, Reprint 2015.

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3. https://www.pdfdrive.com/heat-and-themodynamics-by-mark-waldo-zemanskyrichard-dittman-d37736570.html
4. https://www.youtube.com/watch?v=wTEIYtivVhM
5. https://www.youtube.com/watch?v=6_C8KyU67RU

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Mathematics
SEMESTER - I
ALLIED COURSE - I: PRACTICAL - PHYSICS I
(21UMAA1P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:50**
CREDIT	**:1**	**EXT. MARKS**	**:50**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to determine material's specific physical parameters and study the behaviour of electrical circuits by applying physics concepts.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of physics underlying in the experiments
CO2[K2]: demonstrate the concepts of physics underlying in the experiments
CO3[K3]: calculate the physical parameters of a matter/electrical circuits from the experimental data
CO4[K4]: analyze the experimental results
CO5[K5]: evaluate the physical parameters of a matter/electrical circuits

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	2	-	-	-	1	-
CO2 [K2]	2	2	1	1	-	2	-
CO3 [K3]	2	2	1	1	1	1	1
CO4 [K4]	2	2	2	1	1	1	1
CO5 [K5]	2	3	1	1	1	1	1
Weightage of the course	10	11	5	4	3	6	3
Weighted percentage of Course contribution to POs	1.67	2.26	2.66	1.03	3.13	2.67	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

LIST OF EXPERIMENTS (ANY 8**):**

1. Determination of Young's Modulus of Elasticity of Material of the Beam by Uniform Bending Method using Pin and Microscope
2. Determination of Young's Modulus of Elasticity of Material of the Beam by Non-Uniform Bending Method using Optic Lever
3. Determination of Rigidity Modulus of the Material of Wire by Torsional Oscillations Method
4. Determination of Co-efficient of Viscosity of Water by Capillary Flow Method
5. Determination of Acceleration due to Gravity 'g' and Radius of Gyration of a Compound Bar Pendulum about Its Center of Gravity
6. Determination of Co-efficient of Thermal Conductivity of a Bad Conductor by Lee's Disc Method
7. Determination of Specific Heat of a Liquid by Newton's Law of Cooling Method
8. Determination of Specific Heat Capacity of Solid by the Method of Mixtures
9. Determination of Diameter of a Thin Wire by Air Wedge Arrangement
10. Determination of Refractive Index of Material of a Prism by Minimum Deviation Method
11. Studying the Characteristics of LCR – Series Resonance Circuit and Finding Associated Parameters
12. Calibration of Low Range Voltmeter using Potentiometer

TEXTBOOKS

1. Srinivasan M.N, Balasubramanian S and Ranganathan R. *A Textbook of Practical Physics.* New Delhi : Sultan Chand & Sons, First Edition, Reprint 2011.
2. Ouseph C.C, Rao U.J and Vijayendran V. *Practical Physics and Electronics*. Chennai : Ananda Book Depot, First Edition, Reprint 2019.
3. Ouseph C.C, Srinivasan V and Balakrishnan R. *A Textbook of Practical Physics - Part I.* Chennai : S.Viswanathan (Printers & Publishers) Pvt., Ltd., Revised Edition, Reprint 2000.

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1. Arora C.L. *B Sc Practical Physics.* New Delhi : S.Chand & Sons Co. Ltd., Reprint 2018.
2. Kakani S.L and Shubhra K. *Applied Physics: Theory and Practical*. New Delhi : Viva Books Pvt. Ltd., First Edition, 2015.
3. Manjeet S and Anita D. *Applied Physics: Theory and Experiment*. New Delhi : Vayu Education of India, First Edition, 2011.

4. Tayal D.C. *University Practical Physics*. Mumbai: Himalaya Publishing House, First Millennium Edition, 2000.

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2. http://www.egyankosh.ac.in/bitstream/123456789/18814/1/Experiment-5.pdf
3. http://www.iiserpune.ac.in/~bhasbapat/phy221_files/Lee's%20Method.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
UG PROGRAMME
SEMESTER- I
ABILITY ENHANCEMENT COMPULSORY COURSE I: ENVIRONMENTAL STUDIES (21UESR11)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK : 2 **INT. MARKS: 40**
CREDIT : 1 **EXT. MARKS: 60**
DURATION : 30 hrs **MAX. MARKS :100**

Preamble

This course familiarizes the learners with the essentials of Environmental Studies by focusing on variety of environmental issues and factors affecting environment.

Course Outcomes (CO)

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

CO1[K1]: recognize the importance of environment and role of Individuals in its protection.

CO2[K2]: explain the key concepts of Ecosystem, Food Web and Bio geochemical.

CO3[K3]: apply the right measures for the sustainable use of natural resources.

CO4[K4]: analyse the ethical, cross-cultural, and historical context of environmental issues and the links between Human and Natural Systems.

CO5[K4]: examine the impact of human action on the biological environment

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	2	2	1	1
CO2 [K2]	2	1	-	2	1	1	1
CO3 [K3]	2	1	-	1	1	1	1
CO4 [K4]	1	1	1	1	2	1	1
CO5 [K4]	1	1	-	1	2	1	1
Weightage of the Course	08	5	1	7	08	05	05
Weighted percentage of Course contribution to Pos	1.34	1.03	0.53	1.79	8.33	2.22	3.03

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(6 hrs)**

Structure of earth and its components: Atmosphere – Lithosphere – Hydrosphere – Biosphere. Renewable and non-renewable resources – Forest, water and energy resources.

UNIT II **(6 hrs)**

Ecosystem: Concept of ecosystem – Terrestrial and aquatic. Structure and function – Energy flow in the ecosystem – Food chain and food web – Ecological pyramids – Bio-geo chemical cycle – carbon and nitrogen cycle.

UNIT III **(6 hrs)**

Biodiversity: Introduction – Definition: genetic, species and ecosystem diversity. Indian Biodiversity Hotspots. Threats to biodiversity – Conservation of Biodiversity – In-situ and Ex-situ conservation strategies. IUCN Red list Categories.

UNIT IV **(6 hrs)**

Pollution: Definition – causes – effects and control measures of Air – Water – Noise – soil – nuclear pollution. Global issues – Global warming – acid rain – Ozone layer depletion. Water conservation – rain water harvesting and water recycling – solid waste management.

UNIT V **(6 hrs)**

Human Population and Environment: Population growth, variation among nations. Road safety awareness. Environment and human health. Human Rights. HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health. Contribution of students and teachers in adoption of villages and steps to be taken for green villages.

TEXTBOOKS

1. Dharmaraj,J. *Text book of Environmental studies*, S. Chand and Co. New Delhi, 1995.
2. Susila Appadurai. *Environmental Studies*, New Century Book House, 2012.

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Books

1. Agarwal, K.C.*Environmental Biology*, Nidi publication Ltd, Bikaner, 2001.
2. Odum, E.P. *Fundamentals of Ecology*, W.B. Saunders Co. USA, 1971.
3. Miller, T.G. *Environmental sciences*, Wadsworth Publishing Co, New Delhi. 2004.

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1. https://www.adcidl.com/pdf/India-Road, Traffic-Signs.pdf.
2. https://www.youtube.com/watch?v=QewEi2U1jLs
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG PROGRAMME - B.Sc. Mathematics
SEMESTER - I
SKILL ENHANCEMENT COURSE - I: INTEGRAL CALCULUS AND FOURIER SERIES (21UMAS11)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDIT : 1 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the reduction formula for integrals containing transcendental functions, the geometrical applications of integrals, the relation of gamma and beta function to a variety of integrals, the Fourier series expansion of bounded integral function.

Course Outcomes (CO)

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

CO1[K2]: recognize the properties of double and triple integrals, beta and gamma functions

CO2[K3]: use the integration techniques to integrate double integrals over a region and triple integrals over a three dimensional region

CO3[K3]: calculate the area of a region using double integrals and the volume of a solid using triple integrals

CO4[K4]: investigate the reduction formula for integrals that contain transcendental functions

CO5[K5]: determine the appropriate Fourier series expansion of bounded integrable function

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	2	2	-	2	-	-	-
CO2[K3]	3	2	1	2	-	1	-
CO3[K3]	3	2	1	2	-	1	-
CO4[K4]	3	2	-	2	-	1	1
CO5[K5]	3	2	1	2	-	1	1
Weightage of the course	14	10	03	10	-	04	02

Weighted percentage of Course contribution to POs	2.34	2.06	1.6	2.56	0	1.78	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(6 hrs)**

Reduction Formulae – Reduction Formula for $\int x^k e^{ax}dx$, $\int x^k \cos axdx$, $\int \sin^k xdx$, $\int \tan^k xdx$, $\int \cot^k xdx$, $\int \sec^k xdx$, $\int \operatorname{cosec}^k xdx$, $\int \sin^m x\cos^k xdx$.

UNIT II **(6 hrs)**

Double and Triple Integrals: Introduction – Double Integrals – Evaluation of Double Integrals.

UNIT III **(6 hrs)**

Triple Integrals – Change of Variables in Double and Triple Integrals.

UNIT IV **(6 hrs)**

Beta and Gamma Functions : Introduction – Beta and Gamma Functions – Properties and Results Involving Beta and Gamma Functions.

Unit V **(6 hrs)**

Fourier Series: The Cosine and Sine Series.

TEXTBOOK

1. Arumugam, S. and Thangapandi Isaac, A. "Calculus", Palayamkottai:New Gamma Publishing House, 2014.

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Books

1. Narayanan, S. and Manickavachagam Pillai, T.K. *Calculus Volume II*. S.Viswanathan (Printers and Publishers) Pvt. Ltd, 2006.
2. Narayanan, S. and Manickavachagam Pillai, T.K. *Calculus Volume III*. S.Viswanathan (Printers and Publishers) Pvt. Ltd, 2016.
3. Vital, P.R. and Malini,V. *Calculus*. Chennai: Margham publications, 2006.

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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI

DEPARTMENT OF TAMIL
UG Programme - B.A/B.SC/BCA
SEMESTER - II
பொதுத்தமிழ் - II (21UTAL21)
(From 2021-2022 Batch onwards)

HOURS / WEEK: 6	**INT. MARKS : 40**
CREDITS : 3	**EXT. MARKS : 60**
DURATION : 90 hrs	**MAX. MARKS: 100**

நோக்கம்

சமயஇலக்கியம் தோன்றியதற்கான காலப்பின்னணி மற்றும் சமயம சார்ந்த இலக்கியங்களை மாணவர்களுக்கு அறிவுறுத்தலும், பல்வேறு காலகட்ட சிறுகதை இலக்கியங்களை எடுத்துரைக்கும் நோக்கோடு அமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளை வெற்றிகரமாக முடித்தவுடன் மாணவர்கள்,

CO1[K1]: பல்வேறுசமயம் சார்ந்த இலக்கியவரலாற்றினைஅறிவர்.

CO2[K2]: இறை உருவங்களையும் புராணக்கருத்துக்களையும் கூறுவர்.

CO3[K3]: சமயப்பாடல்களின் அமைப்பினையும் நோக்கத்தினையும் தெளிவாக விளக்குவர்.

CO4[K4]: தமிழ்ச் சிறுகதைகளின் பொருண்மைகளைப் பாகுபடுத்துவர்.

CO5[K4]: சொல்லிலக்கணத்தைப் புரிந்துகொண்டு பிழையின்றி எழுதும் திறனைப் பெறுவர்.

CO-PO Mapping Table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	-	-
CO2[K2]	2	1	-	1	1	-	-
CO3[K3]	2	2	-	2	-	1	-
CO4[K4]	2	2	1	2	1	-	1
CO5[K4]	2	2	1	2	-	1	1
Weightage of the Course	10	8	2	8	2	2	2
Weighted percentage of Course Contribution to POs	1.67	1.65	1.06	2.05	2.08	0.89	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

கூறு I **(18hrs)**

சைவ இலக்கியவரலாறு - **திருஞானசம்பந்தர்**: முதல் திருமுறை- திருப்பிரமபுரம் - தோடுடையசெவியன் (10 பாடல்கள்). **திருநாவுக்கரசர்:**நான்காம் திருமுறை - திருவதிகைவீரட்டானம் - கூற்றாயினவாறு விலக்ககலீர் (10 பாடல்கள்). **சுந்தரர்:** ஏழாம் திருமுறை - திருவெண்ணெய்நல்லூர் பதிகம் - பித்தாபிறைசூடி (10 பாடல்கள்). **மாணிக்கவாசகர்:** குயிற்பத்து (10 பாடல்கள்).

கூறு II **(18hrs)**

வைணவ இலக்கிய வரலாறு - **ஆண்டாள்**: திருப்பாவைமுழுவதும் (30 பாடல்கள்) – **நம்மாழ்வார்**: நான்காம் திருமொழி - நான்காம் பத்து - மண்ணையிருந்துதுழாவி.

கூறு III **(18hrs)**

கிறிஸ்தவ, இஸ்லாமிய இலக்கியவரலாறு - கண்ணதாசன்:இயேசுகாவியம் - மலைப்பொழிவு (முழுவதும்) - குணங்குடியார்:நந்தீஸ்வரக்கண்ணி (51 பாடல்கள்).

கூறு IV **(18hrs)**

சிறுகதைதோற்றம் வளர்ச்சி (தேர்ந்தெடுக்கப்பட்ட 10 சிறுகதைகள்) - **புதுமைப்பித்தன்:** அகல்யை..பி.எஸ். ராமையா:நட்'த்திரக் குழந்தைகள் **த.ஜெயகாந்தன்:** அக்ரஹாரத்துப்பூனை. **வண்ணதாசன்**: ஒருசிறு இசை. **வண்ணநிலவன்:** கரையும் உருவங்கள். **கு.அழகிரிசாமி**: அன்பளிப்பு **விஞ்ஞானி**: முன்னை இட்டதீ. **ஆதவன்:** கறுப்பு அம்பாகதை. **மேலாண்மை பொன்னுச்சாமி**: அன்பெழுத்து. **நாஞ்சில் நாடன்**: சூடியபூ சூடற்க

கூறு V **(18hrs)**

இலக்கணம்: சொல்விளக்கம், சொற்பாகுபாடு (பெயர்ச்சொல், வினைச்சொல், இடைச்சொல், உரிச்சொல்)- அறுவகைவினா - எண்வகை விடை- மொழிப்பயிற்சி: மயங்கொலிப்பிழைகள் (லகர,ளகர,ழகரவேறுபாடு,ரகர,றகரவேறுபாடு - கர,னகர வேறுபாடு).

பாடநூல்கள்

1. *தொகுப்புநூல்,* தமிழியல்துறை, ஸ்ரீ காளீஸ்வரி கல்லூரி (தன்னாட்சி), சிவகாசி.
2. வாசுதேவன், கா.*பன்முகநோக்கில் தமிழ் இலக்கியவரலாறு,* தேவன் பதிப்பகம், திருச்சிராப்பள்ளி, பன்னிரெண்டாம் பதிப்பு: 2017.

பார்வை நூல்கள்

1. அப்துல்ரகுமான் (குறிப்புரை*). குணங்குடியார் பாடற்கோவை,* மணிவாசகர் பதிப்பகம், சென்னை, 2002.
2. பாக்கியமேரி. *தமிழ் இலக்கியவரலாறு,* நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை, நான்காம் பதிப்பு: 2011.
3. ஜெகத்ரட்சகன், எஸ்.*நாலாயிரதிவ்யப் பிரபந்தம்,* முல்லை நிலையம், சென்னை, முதற்பதிப்பு: 1993.
4. ஸ்ரீமத் கந்தசாமித்தம்பிரான் சாமிகள் (பதி.ஆ.). *மூவர் தேவாரம்,*ஞானசம்பந்தம் பதிப்பகம், மயிலாடுதுறை, இரண்டாம் பதிப்பு: 1997.

வலைப்பதிவுகள் (Web Sources)

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2. https://youtu.be/Rj0S6KOruvA
3. https://youtu.be/Z8xgO8ff44g
4. https://youtu.be/PxeeauHz5CQ
5. https://youtu.be/TLU6MO9YEkA
6. https://podhutamizh.blogspot.com/2017/09/blog-post_42.html
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme - B.A./B.Com./ B.B.A./B.SC./BCA
SEMESTER- II
COMMUNICATIVE ENGLISH - II (21UENL21)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS: 100**

Preamble

This course helps the learners to develop their communication skills in English through listening, reading, speaking and writing practices.

Course Outcomes (CO)

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

CO1[K1]: relate and state ideas by reading and listening to recorded interviews and news

CO2[K2]: demonstrate effective speaking skills by offering suggestions, seeking permission and reporting ongoing activities

CO3[K3]: apply knowledge of word power and grammar rules through proverb expansion and paragraph writings

CO4[K4]: analyze simple poems and short stories to develop language skills through literature

CO5[K6]: construct grammatically correct and logically coherent paragraphs

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	1	-	-	-
CO2 [K2]	2	2	-	1	1	-	1
CO3 [K3]	2	2	-	2	-	1	-
CO4 [K4]	2	2	1	2	1	-	1
CO5 [K6]	2	1	1	2	-	1	1
Weightage of the course	10	08	02	08	02	02	03
Weighted percentage of Course contribution to POs	1.67	1.65	1.06	2.05	2.08	0.89	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I - LISTENING AND SPEAKING **(18 hrs)**

A. Listening

Listening to interviews

Listening to news reading

Listening to instructions-download apps in mobile handsets, cooking, sending e-mail

B. Speaking

Inviting person, offering suggestion and seeking permission

Making complaints and asking apology

Expressing likes, dislikes, hopes, wishes, regrets, sympathy, offering condolences, compliments and praising

Reporting conversations, facts, meetings/interviews, ongoing activities and future plans

Talking about the weather, past &future events, interesting plans and arrangements

UNIT II - READING AND WRITING **(18 hrs)**

A. Reading

Reading advertisements

Reading notices

Reading short passages

B. Writing

Proverb Expansion

Paragraph Writing

Essay writing

UNIT III - WORD POWER **(18 hrs)**

Synonyms & Antonyms

Misspelt words

Words related to- House, Clothing, Food, Education, Speaking, Holidays and Sports

UNIT IV - GRAMMAR **(18 hrs)**

Preposition and its kinds

Conjunction and its kinds

Articles

Tenses

UNIT V - LANGUAGE THROUGH LITERATURE **(18 hrs)**

A. Poetry

Sarojini Naidu	-	The Queen's Rival
John Masefield	-	Laugh and be Merry
Alfred Noyes	-	The Highwayman

B. Short Story

Somerset Maugham	-	The Ant and the Grasshopper
Katherine Mansfield	-	A Cup of Tea

TEXTBOOKS

1. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
2. Pillai, Radhakrishna and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.
3. Pillai, Radhakrishna. *Emerald English Grammar and Composition.* Chennai: Emerald Publishers, 2016.

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1. *Life Skills (Jeevan Kaushal) Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
2. Radha, Alamelu et.al. *Situational Grammar and Composition.* Chennai:New Century Book House Pvt. Ltd,2008.
3. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
4. Subramanian A.E. *Gifts to Posterity.* Chennai*: Anu Chitra Publications*, 2003.
5. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.
6. Tilak, Raghukul. *Sarojini Naidu Selected Poems.* New Delhi: Educational Publishers, 2009.

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2. https://lincolnprep.wildapricot.org/resources/Reading%20Selections%20for%20Reading%20Competion/The%20Highwayman.pdf
3. https://learnenglish.britishcouncil.org/general-english/stories
4. https://www.talkenglish.com/lessonindex.aspx
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6. https://www.englishpage.com/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - II
CORE COURSE - III: CLASSICAL ALGEBRA (21UMAC21)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners with some properties of divisibility, congruence and the method to find nature and position of roots of algebraic equations.

Course Outcomes (CO)

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

CO1[K1]: outline the equivalence relation, divisibility in Z, congruences and reciprocal equations

CO2[K2]: explain the properties of divisibility, congruences and the types of reciprocal equations

CO3[K3]: solve linear congruences and cubic, biquadratic equations

CO4[K4]: investigate the types of reciprocal equations and examine the nature and position of roots of polynomial equations

CO5[K5]: determine the nature and position of roots of polynomial equations

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	-	1	-	-	-
CO2[K2]	3	2	1	1	-	-	-
CO3[K3]	3	3	1	2	-	1	1
CO4[K4]	3	3	1	2	-	1	1
CO5[K5]	3	3	2	2	-	1	1
Weightage of the course	15	13	05	08	-	03	03
Weighted percentage of Course contribution to POs	2.5	2.67	2.66	2.05	0	1.33	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Theory of Numbers: Preliminaries: Introduction – Natural Numbers and the Principle of Induction – Equivalence Relations. **Divisibility:** Introduction - Divisibility in Z.

UNIT II **(12 hrs)**

Congruences: Introduction - Congruences – Linear Congruence – Simultaneous Congruences – Euler's Function – Some Theorems on Congruences.

UNIT III **(12 hrs)**

Theory of Equations: Introduction - Formation of Equations – Reciprocal Equations.

UNIT IV **(12 hrs)**

Transformation of Equations – Multiple Roots.

UNIT V **(12 hrs)**

Nature and Position of Roots - Cubic Equations – Biquadratic Equations.

TEXTBOOK

1. Arumugam.S and Thangapandi Issac.A *Classical Algebra.* Palayamkottai: New Gamma Publishing House, 2003.

REFERENCES

Books

1. Manicavachagom Pillay, T.K, Natarajan,T. and Ganapathy, K.S. *Algebra – Volume I.* Chennai: S.Viswanathan Printers and Publishers Pvt. Ltd, 2012.

2. Manicavachagom Pillay, T.K., Natarajan,T. and Ganapathy, K.S. *Algebra – Volume II.* Chennai: S.Viswanathan Printers and Publishers Pvt. Ltd, 2006.

3. Sudha, S. *Algebra, Analytical Geometry (2D) and Trigonometry.* Chennai: Gopalakrishnan, M.D. Emerald Publishers, 1998.

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2. https://www.google.com/url?sa=t&source=web&rct=j&url=https://faculty.math.illinois.edu/~hildebr/347.summer19/nt2.pdf&ved=2ahUKEwi2kMDMwunvAhVvFbcAHUbhCvMQFjAAegQICBAC&usg=AOvVaw1PiIHKcaL_m-BeX_JnMASV&cshid=1617708817107
3. https://www.google.com/url?sa=t&source=web&rct=j&url=https://sites.google.com/a/iitjeemathematics.com/www/conte/quadratic-equations/14-transformation-of-equations&ved=2ahUKEwjs_qT8w-nvA-

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5. https://youtu.be/SCvtxjpVQms

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - II
CORE COURSE - IV: SUMMATION OF SERIES AND TRIGONOMETRY
(21UMAC22)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS:100**

Preamble

This course introduces the learners to the series expansion of functions and the method to sum the series using trigonometric formulae.

Course Outcomes (CO)

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

CO1[K1]: state the binomial series representation of functions, exponential series and logarithmic series, definition of hyperbolic functions

CO2[K2]: identify the general term in series expansion of functions and characteristic property of hyperbolic functions

CO3[K3]: use trigonometric formulae to sum the trigonometric series and to find the expression for sin nθ, cos nθ, $\sin^k\theta$, $\cos^k\theta$

CO4[K4]: investigate the methods of summation of trigonometric series

CO5[K5]: determine the appropriate method to find the sum of trigonometric series

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	-	-	-	-
CO2 [K2]	3	2	1	1	-	-	-
CO3 [K3]	3	3	1	2	-	1	1
CO4 [K4]	3	3	1	2	-	1	1
CO5 [K5]	3	3	1	3	-	1	1
Weightage of the course	15	12	04	08	-	03	03
Weighted percentage of Course contribution to POs	2.5	2.47	2.13	2.05	0	1.33	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Summation of Series: Binomial Series – Exponential Series.

UNIT II **(12 hrs)**

Logarithmic Series. **Hyperbolic Functions**: Hyperbolic Functions.

UNIT III **(12 hrs)**

Inverse Hyperbolic Functions. **Logarithm of a Complex Number**: Logarithm of a Complex Number. **Trigonometric Series:** Introduction – Difference Method.

UNIT IV **(12 hrs)**

Angles in Arithmetic Progression – C+iS Method – Gregory's Series.

UNIT V **(12 hrs)**

Applications of DeMoivre's Theorem: Introduction – DeMoivre's Theorem for rational number – Expression for sin , cos kθ and tan kθ – Expression for $\sin^k\theta$ and $\cos^k\theta$ – Expansion of sin θ, cos θ, tan θ in powers of θ.

TEXTBOOK

1. Arumugam, S. and Thangapandi Issac, A. *Summation of Series and Trigonometry*.Palayamkottai: New Gamma Publishing House, 2003.

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Books

1. Manicavachagom Pillay, T.K., Natarajan,T. and Ganapathy, K.S. *Algebra – Volume I* Chennai: S.Viswanathan Printers and Publishers Pvt. Ltd, 2012.
2. Narayanan, S. and ManicavachagomPillay, T.K. *Trigonometry*. Chennai: S.Viswanathan (Printers & Publishers), Pvt., Ltd., 2011.
3. Raisinghania, M.D., Saxena, H.C. and Dass, H.K. *Simplified Course in Trigonometry*. New Delhi:S. Chand & Company Ltd., 1999.

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2. https://www.scribd.com/document/56338245/bsc-trigno
3. https://www.google.com/url?sa=t&source=web&rct=j&url=https://m.youtube.com/watch%3Fv%3DBPmEcuIflhQ&ved=2ahUKEwiBj66LgdrvAhUEXn0KHbb9AvAQ28sGMAB6BAgDEAk&usg=AOvVaw1nuztYmXKP05yh6nE1K3PA&cshid=1617175902120
4. https://brilliant.org/wiki/expansions-of-certain-trigonometric-functions/
5. https://www.scribd.com/document/323436625/5-Problems-on-Inverse-Hyperbolic-Functions

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Mathematics
SEMESTER - II
ALLIED COURSE - II: PHYSICS II (21UMAA21)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:4**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basic concepts of special theory of relativity, structure of atoms, crystal structures of solids, analog and digital electronics.

Course Outcomes (CO)

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

CO1[K1]: outline the basic concepts of relativity, atomic and crystal physics, analog and digital electronics

CO2[K2]: explain the basic concepts of relativity, atomic and crystal physics, analog and digital electronics

CO3[K3]: choose appropriate formulae to solve problems

CO4[K4]: analyze the applicability of special theory of relativity, physical parameters of atoms, crystals, and behavior of electronic circuits

CO5[K4]: inspect the applicability of special theory of relativity, physical parameters of atoms, crystals, and behavior of electronic circuits

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	1	-	2	-	1	-
CO3 [K3]	3	3	1	1	-	1	1
CO4 [K4]	2	3	2	1	-	1	1
CO5 [K4]	2	3	2	1	1	1	1
Weightage of the course	13	11	5	6	1	5	3
Weighted percentage of Course contribution to POs	2.17	2.26	2.66	1.54	1.04	2.22	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I – SPEICAL THEORY OF RELATIVITY (12 hrs)

Theory of Relativity - Frame of Reference – Inertial Frames – Non Inertial Frames – Galilean Transformation Equations – Michelson Morley Experiment. Einstein's Special Theory of Relativity – Lorentz Transformations – Lorentz-Fitzgerald Contraction – Time Dilation – Variation of Mass with Velocity – Mass-Energy Equivalence.

UNIT II – ATOMIC PHYSICS (12 hrs)

Bohr Atom Model – Drawbacks of Bohr Atom Model – Sommerfeld's Relativistic Atom Model – Stern and Gerlach Experiment – Space Quantization - The Vector Atom Model – Quantum numbers Associated with the Vector Atom Models – Pauli Exclusion Principle – The Periodic Elements – Electron Configurations.

UNIT III – CRYSTAL PHYSICS (12 hrs)

Introduction – Different Features of the Crystals – Bravais Lattice – Seven Crystal Systems – Cubic Crystal Structures (SC, BCC, FCC, diamond, ZnS & NaCl structures) – Miller Indices – Distances of Separation between Successive Planes – Diffraction of X-rays by Crystal Planes – X-ray Diffraction Methods – Laue Method – Debye-Scherrer Method – Rotating Crystal Method.

UNIT IV – ANALOG ELECTORNICS (12 hrs)

PN Junction Diode Rectifier – Ripple Factor – Capacitor Filter, Choke Input Filter and Π Section Filter – Voltage Stabilization – Zener Diode – Zener Diode as Voltage Stabilizer – Solving Zener Diode Circuits –Transistors – Characteristics of CE Mode Connection – Faithful Amplification – Transistor Biasing – Stabilization – Voltage Divider Bias – Single Stage Amplifier.

UNIT V – DIGITAL ELECTRONICS (12 hrs)

Number System – Binary Number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Octal Numbers – Hexa Decimal Numbers – Logic Gates – NOT, OR, AND (Realization Using Diode and Transistor) – NOR & NAND as Universal Gates – Boolean Laws and Theorems – Binary Addition – Arithmetic Building Blocks – Half Adder – Full Adder.

TEXTBOOKS

1. Murugeshan R and Kiruthiga Sivaprasath. *Modern Physics.* New Delhi : S.Chand & Company Ltd., Eighteenth Edition, Reprint 2019. **(UNITS I, II & III)**
2. Mehta V.K and Rohit Mehta. *Principles of Electronics.* New Delhi : S.Chand & Company Ltd., Revised Eleventh Edition, Reprint 2013. **(UNIT IV)**

3. Albert P.Malvino, Donald P.Leach and Goutam Saha. *Digital Principles and Applications.* Chennai : Tata McGraw Hill Education (India) Pvt. Ltd., Eighth Edition, Reprint 2017. **(UNIT V)**

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1. Arthur Beiser. *Concepts of Modern Physics.* New Delhi : Tata McGraw-Hill Publication, Sixth Edition, Reprint 2006.
2. Albert Malvino and David J.Bates. *Electronic Principles*. Chennai : McGraw Hill Education (India) Pvt. Ltd., Seventh Edition, Reprint 2018.
3. Thomas L.Floyd. *Digital Fundamentals.* New Delhi : Pearson Education (Singapore) Pvt. Ltd., Seventh Edition, Reprint 2002.

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1. https://www.pdfdrive.com/digital-principles-application-by-malvino-e34313541.html
2. https://www.pdfdrive.com/electronic-principles-e51577263.html
3. https://www.pdfdrive.com/fundamentals-of-physics-textbook-e33735280.html
4. https://www.pdfdrive.com/materials-science-and-engineering-a-first-course-d187628834.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG PROGRAMME –B.Sc. Mathematics
SEMESTER - II
ALLIED COURSE - II: PRACTICAL - PHYSICS II
(21UMAA2P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:50**
CREDIT	**:1**	**EXT. MARKS**	**:50**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to determine material's specific physical parameters and study the behaviour of electronic circuits by applying physics concepts.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of physics underlying in the experiments
CO2[K2]: demonstrate the concepts of physics underlying in the experiments
CO3[K3]: calculate the physical parameters of a matter/electronic circuits from the experimental data
CO4[K4]: analyze the experimental results
CO5[K5]: evaluate the physical parameters of a matter/electronic circuits

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	2	-	-	-	1	-
CO2 [K2]	2	2	1	1	-	2	-
CO3 [K3]	2	2	1	1	1	1	1
CO4 [K4]	2	2	2	1	1	1	1
CO5 [K5]	2	3	1	1	1	1	1
Weightage of the course	10	11	5	4	3	6	3
Weighted percentage of Course contribution to POs	1.67	2.26	2.66	1.03	3.13	2.67	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

LIST OF EXPERIMENTS (any 8**):**

1. Comparison of Viscosities of Two Liquids using Ostwald Viscometer
2. Determination of Dispersive Power of the Material of the Prism of a Prism using Spectrometer
3. Determination of Wavelength of Monochromatic Source by Forming Newton's Rings
4. Determination of the Wavelengths of Prominent Spectral Lines of Mercury Spectrum by Grating Normal Incidence Method
5. Study of Characteristics of a Zener Diode
6. Study of Characteristics of a Transistor under C.E. Mode
7. Construction of Logic Gates (AND, OR, NOT, NAND, NOR) using Discrete Components
8. Verification of Universality of NAND and NOR Gates using IC 7400 and IC 7402 respectively
9. Implementation of Half Adder and Full adder Circuits using Logic Gates
10. Determination of Charge of an Electron using Copper Voltammeter.
11. Determination of Resistance and Specific Resistance of a given coil using Carey-Foster's Bridge
12. Calibration of High Range Voltmeter using Potentiometer

TEXTBOOKS

1. Srinivasan M.N, Balasubramanian S and Ranganathan R. *A Textbook of Practical Physics.* New Delhi : Sultan Chand & Sons, First Edition, Reprint 2011.
2. Ouseph C.C, Rao U.J and Vijayendran V. *Practical Physics and Electronics*. Chennai : Ananda Book Depot, First Edition, Reprint 2019.
3. Ouseph C.C, Srinivasan V and Balakrishnan R. *A Textbook of Practical Physics - Part I & II.* Chennai : S.Viswanathan (Printers & Publishers) Pvt., Ltd., Revised Edition, Reprint 2000.
4. Virendra Kumar. *Digital Electronics: Theory and Experiments*. New Delhi : New Age International (P) Ltd., Second Edition, 2015.

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1. Arora C.L. *B Sc Practical Physics.* New Delhi : S.Chand & Sons Co. Ltd., Reprint 2018.
2. Kakani S.L and Shubhra K. *Applied Physics: Theory and Practical*. New Delhi : Viva Books Pvt. Ltd., First Edition, 2015.
3. Manjeet S and Anita D. *Applied Physics: Theory and Experiment*. New Delhi : Vayu Education of India, First Edition, 2011.
4. Tayal D.C. *University Practical Physics*. Mumbai: Himalaya Publishing House, First Millennium Edition, 2000.

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1. https://www.youtube.com/watch?v=fWhgguWc8rk
2. https://www.youtube.com/watch?v=wkdz1T-ywVk
3. https://www.youtube.com/watch?v=BxbXnYFqygU&t=311s
4. https://www.youtube.com/watch?v=YslaWEpTDWk
5. https://www.youtube.com/watch?v=aXFNoYa95-8

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI

UG PROGRAMME

SEMESTER –II

ABILITY ENHANCEMENT COMPULSORY COURSE: II -VALUE EDUCATION

(21UVED21)

(From 2021 - 2022 Batch onwards)

HOURS/WEEK : 1 **INT. MARKS : 40**

CREDIT : 1 **EXT. MARKS : 60**

DURATION : 15 hrs **MAX. MARKS: 100**

Preamble

This course aims to promote the values of peace, non-violence, religious tolerance and secular thinking among the learners and equip the learners for a harmonious living in the multi-cultural pluralistic society.

Course Outcomes (CO)

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

CO1[K1]: identify the basic human values and ethics necessary for harmonious Human relationship

CO2[K2]: explain the significance of social values and religious tolerance to live in Peace

CO3[K3]: articulate the life-changing principles of brotherhood, honesty, loyalty and community solidarity

CO4[K4]: analyse emotional, social, spiritual attribute to acquire well balanced Personality

CO5[K4]: examine the importance of harmonious living in the multi-culturalPluralistic society

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	1	1	-	2
CO2 [K2]	2	1	-	1	2	1	2
CO3 [K3]	2	1	-	1	2	1	1
CO4 [K4]	1	1	1	1	2	1	1
CO5 [K4]	1	1	-	1	2	1	1
Weightage of the course	08	05	01	05	09	04	07
Weighted percentage of Course contribution to POs	1.34	1.03	0.53	1.28	9.38	1.78	4.24

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I – VALUES AND INDIVIDUAL (3 hrs)

Meaning of values – classification of values – Need for value education – Personal values like adaptability, courage, cheerfulness, dignity of labour and self control – Self discipline - Self Confidence - Self initiative - Social values like sacrifice, forgiveness, Honesty, good manners, tolerance, friendship, hospitality, cooperation and civic sense – Moral values like purity, dedication, punctuality, loyalty, truthfulness and sense of duty.

UNIT II – VALUES AND SOCIETY (3 hrs)

Definition of society – democracy – secularism – socialism – Human rights – social integration – Social Justice – Role models: Akbar, Balagangadhar Tilak, Abdul Kalam, Mother Teresa.

UNIT III – VALUES AND RELIGIONS (3 hrs)

Values in Hinduism, Christianity, Islam and Buddhism – Need for religious harmony inter faith dialogue – Role Models: Vivekananda, Narayana Guru, Aravindar, Tagore, Vallalar Ramalingar, Gandhi.

UNIT IV – VALUES AND NATIONAL INTEGRATION (3 hrs)

Secularism and National Integration – Message from the life of Gandhiji, Nehru, Bharathi, Subash Chandra Bose, Sarojini Naidu etc.

UNIT V – VALUES AND SCIENCE (3 hrs)

Indian Gurus – Indian Scientists – Indian Universities – Indian Mathematicians and World Scientists – Science and Religion – Science, Technology development and values – Science and Human values.

TEXTBOOK

1. Pitchaikani Prabhaharan, A. Babu Franklin, M.Archanadevi, *Value education*, Sri Kaliswari college (Autonomous), Sivakasi, 2017.

REFERENCES

Books

1. Subramanyam, K. *Values in Education*, Ramana Publications, 1995
2. Swamy Chidbhavananda, *Indian National Education*, Publication by Ramakirshna Tapovanam.
3. அறிஞர் குழு (தொகுப்பு). *வாழ்வியல் விழுமியங்கள்*, உலக சமுதாய சேவா சங்கம், ஆழியாறு

Web Sources

1. https://www.youtube.com/watch?v=ruKY3GqBvYQ.
2. https://www.republicworld.com/technology-news/science/15-famous-indian-scientists-list-know-what-were-their-innovations.html.

3. https://www.youtube.com/watch?v=M9_l9DDvEsw

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - II
SKILL ENHANCEMENT COURSE - II : DATA INTERPRETATION (21UMAS21)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDITS : 2 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the process of reviewing the data and some techniques to determine the signification and implications of data.

Course Outcomes (CO)

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

CO1[K2]: describe the method of collecting data, characteristics of data, the type of classification of data in terms of statistical survey

CO2[K3]: draw inference from data represented using bar graphs, pie charts, line graphs

CO3[K4]: interpret data diagrammatically and graphically

CO4[K5]: evaluate the method of collecting data and representation of data

CO5[K6]: prepare questionnaires for collection of data and arrange data according to classification

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	2	1	-	2	-	-	-
CO2[K3]	2	2	1	2	1	1	1
CO3[K4]	2	2	1	1	1	1	1
CO4[K5]	2	2	1	1	1	2	1
CO5[K6]	1	1	-	1	-	2	1
Weightage of the course	09	08	03	07	03	06	04
Weighted percentage of Course contribution to POs	1.5	1.65	1.6	1.79	3.13	2.67	2.42

Based on the level of contribution ('3'-High,'2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(6 hrs)**

Statistical Survey and Collection of Data: Statistical Survey – Collection of Data.

UNIT II **(6 hrs)**

Classification and Tabulation: Classification – Frequency Distribution – Tabulation.

UNIT III **(6 hrs)**

Diagrammatic and Graphic Presentation: Diagrammatic Representation.

UNIT IV **(6 hrs)**

Diagrammatic and Graphic Presentation: Graphic Presentation of Data.

UNIT V **(6 hrs)**

Data Interpretation: Bar Graphs – Pie Charts – Line Graphs.

TEXTBOOKS

1. Manoharan, M. *Statistical Methods Theory and Practice.* Palani : Palani Paramount Publications, 2018. **(UNITS I, II, III & IV)**
2. Aggarwal, R.S. *Quantitative Aptitude*. New Delhi : S Chand and Company Limited, 2016. **(UNIT V)**

REFERENCES

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1. Hooda, R.P. *Introduction to Statistics*. New Delhi : Macmillan Indian Ltd, 2005.
2. Pillai, R.S.N. and Bagavathi. *Statistics – Theory and Practice*. New Delhi: S.Chand & Company Ltd, 2013**.**
3. Narayanan Nadar,E. *Statistics.* New Delhi : PHI Learning Private Limited, Second Edition, 2015.

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1. https://www.lkouniv.ac.in/site/writereaddata/siteContent/202004241216240370priyamka_SDS_COLLECTION_OF_DATA.pdf
2. https://books.google.co.in/books?id=kUZLAgAAQBAJ&printsec=frontcover#v=onepage&q&f=false
3. https://www.google.co.in/books/edition/STATISTICS/Ow2DBgAAQBAJ?hl=en&gbpv=1&dq=E.+Narayanan+Nadar.++Statistics.&printsec=frontcover
4. https://www.google.co.in/books/edition/Statistical_Methods/bRUwgf_q5RsC?hl=en&gbpv=1&dq=statistical+methods+book&printsec=frontcover
5. https://www.kluniversity.in/arp/uploads/2096.pdf
6. https://nptel.ac.in/content/storage2/113/101/113101096/MP4/mod01lec02.mp4

SRI KALISWARI COLLEGE (AUTONOMOUS),
SIVAKASIUG PROGRAMME
SEMESTER – II
DISASTER MANAGEMENT (21UDMG21)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**: 1**		**INT. MARKS**	**:**	**40**
CREDIT	**: 1**		**EXT. MARKS**	**:**	**60**
DURATION	**: 15 hrs**		**MAX. MARKS**	**:**	**100**

Preamble

This course introduces the learners to know the causes and impact of disastersand the agencies for disaster management in India.

Course Outcomes (CO)

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

CO1[K1]: outline the causes and impact of disasters.

CO2[K2]: explain the features of national policy on disaster management.

CO3[K3]:present the issues in rehabilitation.

CO4[K4]:classify the mitigation measures.

CO5[K5]:assess the role of the agencies for disaster management.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	1	1	-	2	2
CO2[K2]	2	1	-	1	-	-	1
CO3[K3]	1	2	1	1	-	-	2
CO4[K4]	1	2	-	1	1	2	2
CO5[K5]	1	2	-	1	1	-	1
Weightage of the course	07	08	02	05	02	04	08
Weighted percentage of Course contribution to Pos	1.17	1.65	1.06	1.28	2.08	1.78	4.85

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(3 hrs)**

Introduction – Disaster – Hazards – Causes and Impact of Disasters – Levels of Disaster – Casual Factors of Disaster – Phases of a Disaster.

UNIT II **(3 hrs)**

Disaster Mitigation – Risk Reduction Measures – Mitigation Actions – Disaster Management Cycle – Classification of Mitigation Measures.

UNIT III **(3 hrs)**

Disaster Preparedness and Planning – Objectives – Strategies – Elements of Disaster Preparedness – Principles of Disaster Planning.

UNIT IV **(3 hrs)**

Disaster Rehabilitation – Issues in Rehabilitation – Objectives – Approaches – Elements of a Rehabilitation Programme.

UNIT V **(3 hrs)**

Framework Disaster Management in India – Features of National Policy on Disaster Management – Primary and Secondary Relief Functions of Central Government – Disaster Management Act 2005 – Agencies for Disaster Management: India Red Cross Society, NIDM – Bharat Scouts and Guides, India Paramilitary Forces.

TEXTBOOK

1. Satish Modh. *Introduction to Disaster Management*. New Delhi: Macmillan Publishers India Limited, 1st Edition, 2015.

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1. Balamurugan P K and Ajith Kumar S. *Disaster Management*. Chennai: New CenturyBook House Private Limited, 1stEdition, 2020.
2. Dasgupta R. *Disaster Management and Rehabilitation.* New Delhi: Mittal Publications,1stEdition, 2010.
3. Narayanan B. *Disaster Management*. NewDelhi: A.P.H. Publishing Corporation,1st Edition, 2009.

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1. https://nptel.ac.in/courses/105/104/105104183/
2. https://nidm.gov.in/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF TAMIL
UG Programme - B.A/B.Sc/BCA
SEMESTER - III
பொதுத்தமிழ் - III (21UTAL31)
(From 2021-2022 Batch onwards)

HOURS /WEEK : 6	**INT. MARKS : 40**
CREDITS : 3	**EXT. MARKS : 60**
DURATION : 90 hrs	**MAX. MARKS :100**

நோக்கம்

காப்பியம், சிற்றிலக்கியம், உரைநடை உள்ளிட்ட இலக்கியவகைகளை அறிமுகம் செய்து, அவற்றைச் சமூக, சமயச் சூழலில் விளங்கவைத்து, யாப்பு, அணி உள்ளிட்ட மொழிக் கட்டமைப்புகளை உணர்த்தி, உரைநடை மூலம் படைப்பாளராகும் தகுதியைப் பெற வைத்து, பல்வேறு நிகழ்வுகளில் நடைபெறும் போட்டிகளில் பங்கேற்கச் செய்யும் வகையில் இத்தாள் வடிவமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளை வெற்றிகரமாக முடித்தவுடன் மாணவர்கள்,

CO1[K1]: காப்பியங்களில் கூறப்பட்டுள்ளவாழ்வியல் நெறிகளாகிய அறம், பொருள், இன்பம், வீடு ஆகியவற்றைப் பற்றி அறிவர்.

CO2[K2]: செய்யுட்களில் இடம்பெறும்அணிநலன்களைக் காண்பர்.

CO3[K3]: யாப்புமரபைக் கற்றுணர்ந்துகவிதையை இனம் காணும் ஆற்றலைப் பெறுவர்.

CO4[K4]: சிற்றிலக்கியங்கள் உணர்த்தும் சமூகத்தையும் விழுமியத்தையும் விவாதிக்கும் திறனைப் பெறுவர்.

CO5[K4]: சமயங்கள் உணர்த்தும் அறக்கருத்துக்களைப் பகுப்பாய்வுசெய்வர்.

CO-PO Mapping Table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	-	-
CO2[K2]	2	1	-	1	-	-	-
CO3[K3]	2	2	-	2	1	-	-
CO4[K4]	2	2	1	2	-	1	1
CO5[K4]	2	2	1	2	1	1	1
Weightage of the Course	10	8	2	8	2	2	2
Weighted percentage of Course Contribution to Pos	1.67	1.65	1.06	2.05	2.08	0.89	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

கூறு I **(18 hrs)**

காப்பியம் I: காப்பிய இலக்கிய வரலாறு, சிலப்பதிகாரம் - அடைக்கலக்காதை (முழுவதும்) - மணிமேகலை - பளிக்கறைபுக்ககாதை (முழுவதும்) - சீவகசிந்தாமணி - காந்தர்வதத்தையார் இலம்பகம் (தேர்ந்தெடுக்கப்பட்ட 15 பாடல்கள்) - சிலைத்தொழிற் (657), கருங்கொடிப் புருவம் (658),திருமலர்க் கமலத் (662), விடுகணைவிசையின் (701), கழித்தவேலேறு (715), தடங்கணாள் பணியினால் (716), சுரந்துவானம் (717), நீர்நின் றளகிற் (718), கல்சேர் பூண்கொள் (719), இருநிலமடந்தை (720), தீந்தொடைநரம்பின் (721), பணிவரும் (722), விண்ணவர் வியப்ப (729), பருந்தும் நிழலும் (730), பண்ணொன்றுபாட (735)

கூறு II **(18 hrs)**

காப்பியம் II: திருவிளையாடற்புராணம் - கடல் சுவற வேல்விட்ட படலம் முழுவதும் - (19 பாடல்கள்) - கம்பராமாயணம் - ஆரணியகாண்டம் - சவரி பிறப்பு நீங்கு படலம் முழுவதும் (9 பாடல்கள்) - பாரதிதாசன் - சஞ்சீவிபர்வதத்தின் சாரல் (முழுவதும்)

கூறு III **(18 hrs)**

சிற்றிலக்கியம்: சிற்றிலக்கியவரலாறு, காரைக்காலம்மையார் - அற்புதத் திருவந்தாதி - (1-15 பாடல்கள்) - மீனாட்சியம்மை பிள்ளைத்தமிழ்- வருகைப்பருவம் (10 பாடல்கள்) - முக்கூடற்பள்ளு - குடிமை - பெருமை (12-22 பாடல்கள்)

கூறு IV **(18 hrs)**

உரைநடை: உரைநடையின் தோற்றமும் வளர்ச்சியும், சொல்லின் செல்வன் - க.நஞ்சையன், படிப்பது எப்படி? - ம.திருமலை, தொல்காப்பியத்தில் கோளியல் நெறி - ச.பாரிஜாதம், பாவேந்தரின் சமுதாயப் பார்வை - பாக்கியமேரி, இசையும் இயல்பும் - கி.ஈஸ்வரி, கம்பராமாயணத்தில் உறவுகள் - பெ.மகேஸ்வரி

கூறு V **(18 hrs)**

யாப்பு: பாவின் பொதுவிலக்கணமும் வகைகளும்(வெண்பா - ஆசிரியப்பா - கலிப்பா - வஞ்சிப்பா) **அணிகள்:** உவமையணி – உருவக அணி - பிறிதுமொழிதல் அணி - வேற்றுமையணி - தற்குறிப்பேற்றஅணி - சிலேடைஅணி

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1. *தொகுப்பு நூல்,*தமிழியல்துறை,ஸ்ரீ காளீஸ்வரிகல்லூரி (தன்னாட்சி),சிவகாசி.

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1. சீனிவாசன், ரா. *சீவகசிந்தாமணி,*அணியகம்,சென்னை, 2000.
2. தமிழண்ணல். *புதியநோக்கில் தமிழ் இலக்கியவரலாறு*, மீனாட்சி புத்தக நிலையம், மதுரை, 2008.
3. ஜகந்நாதன். கி.வா. *தமிழ்க் காப்பியங்கள் (ஆராய்ச்சி),* அமுதநிலையம் லிமிடெட், சென்னை, 1991.

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1. https://youtu.be/AY7R2D2GGQA
2. https://youtu.be/hmqTbZjrnu0
3. www.tamilvu.org/ta/courses-degree-c031-c0313-html-c03132I1-18030
4. https://ta.m.wikipedia.org/wiki/jkpopy; rpw;wpyf;fpaq;fs;

5. https://youtu.be/Q7du9EglmBg

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme - B.A./B.SC./BCA
SEMESTER- III
COMMUNICATIVE ENGLISH - III (21UENL31)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS : 100**

Preamble

This course helps the learners to develop their communication skills in English through listening, speaking, reading and writing practices.

Course Outcomes (CO)

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

CO1[K1]: relate and state ideas by reading simple poems and listening to telephonic conversations

CO2[K2]: demonstrate effective speaking skills by making speech presentations, discussing television programmes and sports events

CO3[K3]: apply knowledge of word power and grammar rules through diary writing, dialogue writing and writing newspaper reports

CO4[K4]: analyze short fiction to develop language skills through literature

CO5[K6]: construct grammatically correct and logically coherent essays on global problems and environmental issues

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	2	-	-	-
CO2[K2]	2	2	-	2	1	1	-
CO3[K3]	2	2	1	2	1	1	-
CO4[K4]	2	2	1	2	-	-	1
CO5[K6]	2	1	1	1	1	1	1
Weightage of the Course	10	08	03	09	03	03	02
Weighted percentage of Course contribution to Pos	1.67	1.65	1.6	2.31	3.13	1.33	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I -LISTENING AND SPEAKING **(18 hrs)**

A. Listening

Listening to short speech

Listening to telephonic conversation

Listening to poetry

B. Speaking

Telephone etiquette in telephone conversation

Answering the Telephone and asking for someone

Making enquiries on the phone, Leaving messages

Presentation: Global Warming, Pollution, Women Empowerment, Communicable Diseases, System of Education, Economy, Industry, Government etc

Discussion: Television Programmes, Lessons, College facilities, Local facilities, Sports-watching or Playing, Types of food, Types of transport.

UNIT II - READING AND WRITING **(18 hrs)**

Reading: Comprehension Passages: Newspaper articles, Reports and Paraphrase Stories.

Writing: Diary Writing**,** Dialogue Writing**,** Report Writing: Newspaper Reports, Field visits, Meetings and Future Plans

UNIT III - WORD POWER **(18 hrs)**

Portmanteau words

Idioms & Phrases

Words related to- Work, Time, Distance and Dimension, Environment, The Natural World and Global Problems

UNIT IV - GRAMMAR **(18 hrs)**

Sentence-Subject and Predicate

Kinds of Sentences

Sentence Patterns

Question Words and Framing Questions

Question Tags

Degrees of Comparison

Voice

UNIT V - LANGUAGE THROUGH LITERATURE **(18 hrs)**

Abridged version of Fiction

Alexandre Dumas	- The Count of Monte Cristo
Charles Dickens	- Oliver Twist
R.M.Ballantyne	- The Coral Island

TEXTBOOKS

1. Dickens, Charles. *Oliver, Twist*. Chennai: Nesting Books Publishing and Distributors (p) Ltd, 2018.
2. Dumas, Alexandre. The *Count of Monte Cristo*. Chennai: Nesting Books Publishing and Distributors (p) Ltd, 2018.
3. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
4. Pillai, Radhakrishna and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.

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1. *Life Skills* (Jeevan Kaushal) *Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
2. Dickens, Charles. *Oliver Twist*. Bangalore: Vasan Publications, 2011.
3. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
4. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.

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2. https://www.vappingo.com/word-blog/86-great-examples-of-portmanteau/
3. https://blog.hubspot.com/service/phone-etiquette
4. https://www.talkenglish.com/lessonindex.aspx
5. https://www.englishhelper.com/
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - III
CORE COURSE - V: SEQUENCES AND SERIES (21UMAC31)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the behaviour of sequences and series of real numbers.

Course Outcomes (CO)

On Successful completion of the course, the learners will be able to

CO1[K2]: explain the fundamental concepts of sequences and series of real numbers

CO2[K3]: apply the abstract concepts to produce proofs of results that arise in the context of sequences and series of real numbers

CO3[K3]: apply the standard tests to test the convergence of series of real numbers

CO4[K4]: investigate the limits of sequences of real numbers

CO5[K5]: determine the behaviour of monotonic sequences

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	2	-	-	-
CO2[K3]	3	2	1	2	-	-	-
CO3[K3]	3	3	1	2	-	-	-
CO4[K4]	3	3	1	2	-	1	1
CO5[K5]	3	3	1	2	-	1	1
Weightage of the course	15	13	05	10	-	02	02
Weighted percentage of Course contribution to Pos	2.5	2.67	2.66	2.56	0	0.89	1.21

Based on the level of contribution('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(12 hrs)**

Sequences: Introduction – Sequences – Bounded Sequences – Monotonic Sequences – Convergent Sequences – Divergent and Oscillating Sequences – The Algebra of Limits.

UNIT II **(12 hrs)**

Behaviour of Monotonic Sequences – Some Theorems on Limits.

UNIT III **(12 hrs)**

Subsequences – Limit Points – Cauchy Sequences – The Upper and Lowe Limits of a Sequence. **Series of Positive Terms:** Infinite Series – Comparison Test.

UNIT IV **(12 hrs)**

Kummer's Test – Root Test and Condensation Test – Integral Test.

UNIT V **(12 hrs)**

Series of Arbitrary Terms: Alternating Series – Absolute Convergence – Tests for Convergence of Series of Arbitrary Terms.

TEXTBOOK

1. Arumugam, S. and Thangapandi Isaac, A. *Sequences and Series and Fourier Series.* Palayamkottai: New Gamma Publishing House, 2006.

REFERENCES

Books

1. Richard R. Goldberg. *Methods of Real Analysis*. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd, 2017.
2. Shanti Narayanan and Rai Singhania, M.D. *Elements of Real Analysis*. New Delhi: S.Chand & Company Ltd, 8th Revised Edition, 2007.
3. Kar, B.K. *An Introduction to Modern Analysis Volume I*. Kolkata: Books and Allied (P) LTD, 2013.

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2. https://youtu.be/4EYko9rdF7g
3. https://math.libretexts.org/Courses/Monroe_Community_College/MTH_211_Calculus_II/Chapter_9%3A_Sequences_and_Series/9.2%3A_Infinite_Series
4. https://www.youtube.com/watch?v=teM8h3Nk09I
5. https://www.whitman.edu/mathematics/calculus_online/section11.06.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - III
CORE COURSE - VI: MATHEMATICAL STATISTICS (21UMAC32)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners with a variety of numerical measures that are used to summarize quantitative data and distribution function, generating function of random variables.

Course Outcomes (CO)

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

CO1[K2]: explain the basic statistical methods and techniques in data analysis
CO2[K3]: apply the statistical methods and techniques to find numerical measures of quantitative data
CO3[K3]: calculate mathematical expectation and generating function of random variables
CO4[K4]: analyze the properties of distribution functions of random variables
CO5[K5]: determine the curve that best fit the given data

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	-	2	-	-	-
CO2[K3]	3	2	1	2	1	1	-
CO3[K3]	3	2	1	2	1	1	-
CO4[K4]	3	3	1	1	1	2	1
CO5[K5]	3	3	1	1	1	2	1
Weightage of the course	15	12	04	08	04	06	02
Weighted percentage of Course contribution to Pos	2.5	2.47	2.13	2.05	4.17	2.67	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Frequency Distributions and Measures of Central Tendency: Frequency Distributions – Graphic Representation of a Frequency Distribution – Averages or Measures of Central Tendency or Measures of Location – Requisites for an Ideal Measure of Central Tendency – Arithmetic Mean – Median – Mode – Geometric Mean - Harmonic Mean – Selection of an Average – Partition Values.

UNIT II **(12 hrs)**

Measures of Dispersion, Skewness and Kurtosis: Dispersion – Characteristics for an Ideal Measure of Dispersion - Measures of Dispersion – Range – Quartile Deviation – Mean Deviation – Standard Deviation and Root Mean Square Deviation – Coefficient of Dispersion –Moments – Pearson's β and γ Co-efficients. – Skewness – Kurtosis.

UNIT III **(12 hrs)**

Random Variables - Distribution Functions: Random Variable – Distribution Function – Discrete Random Variable – Continuous Random Variable – Joint Probability Mass Function and Marginal and Conditional Probability Functions – Transformation of One-Dimensional Random Variable.

UNIT IV **(12 hrs)**

Mathematical Expectation, Generating Functions and Law of Large Numbers: Mathematical Expectation – Addition Theorem of Expectation – Multiplication Theorem of Expectation – Covariance – Expectation of a Linear Combination of Random Variables – Variance of a Linear Combination of Random Variables – Expectation of a Continuous Random Variable – Conditional Expectation and Conditional Variance – Moment Generating Function – Cumulants – Characteristic Function – Chebyshev's Inequality – Weak-Law of Large Numbers.

UNIT V **(12 hrs)**

Curve Fitting and Principle of Least Squares: Curve Fitting – Most Plausible Solution of a System of Linear Equations – Conversion of Data to Linear Form.

TEXTBOOK

1. Gupta, S.C. and Kapoor, V.K. *Elements of Mathematical Statistics.* New Delhi: Sultan Chand & Sons, 2006.

REFERENCES

Books

1. Arumugam, S. and Thangapandi Isaac, A. *Statistics*. Palayamkottai: New Gamma Publishing House, 2009.
2. Gupta, S.P. *Statistical Methods*. New Delhi: Sultan Chand and Sons, 2011.

3. Kapur, J.N. and Saxena, H.G. *Mathematical Statistics*. New Delhi: S.Chand & Company LTD, 1989.

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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF INFORMATION TECHNOLOGY
UG Programme – B.Sc. Mathematics
SEMESTER – III
ALLIED COURSE – III: PROGRAMMING IN C AND C++
(21UMAA31)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the importance of C & C++ Programming Languages and to explore the creative programming skills.

Course Outcomes (CO)

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

CO1[K1]: identify the basic concepts and importance in procedural languages

CO2[K2]: explain the structure of array and strings in programming languages

CO3[K3]: apply different operations on functions, pointers, structures & unions

CO4[K4]: classify the concepts in object oriented programming in terms of software reuse and managing complexity to solve real-world problems

C05[K4]: analyze the characteristics of procedure and object oriented programming languages

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	1	1	1	-	-
CO2[K2]	2	2	-	2	-	-	-
CO3[K3]	3	2	1	1	1	2	1
CO4[K4]	2	2	1	2	1	2	1
CO5[K4]	2	3	1	2	1	2	2
Weightage of the course	11	11	04	08	04	06	04
Weighted percentage of Course contribution to POs	1.84	2.26	2.13	2.05	4.17	2.67	2.42

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(12 hrs)**

Overview of C: History of C – Importance of C – Basic Structure of C Programs. **Constants, Variables and Data Types:** Introduction – Character Set – C Tokens – Keywords and Identifiers – Constants – Variables – Data Types –

Declaration of Variables – Declaration of Storage Class. **Operators and Expressions**: Introduction – Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operator – Bitwise Operators – Special Operators. **Managing Input/Output Operations**: Introduction – Reading a Character – Writing a Character – Formatted Input – Formatted Output.

UNIT II **(12 hrs)**

Decision Making and Branching: Introduction – Simple IF Statement – If Else Statement –Nesting of IF Else Statements – The Else IF Ladder – The Switch Statement – The GOTO Statement. **Decision Making and Looping**: Introduction – The While Statement – The do Statement – The forStatement. **Arrays:** Introduction – One Dimensional Arrays – Declaration of One Dimensional Arrays – Initialization of One Dimensional Arrays – Two Dimensional Arrays – Initializing Two Dimensional Arrays – Multi Dimensional Arrays. **Character Arrays and Strings:** Introduction – Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to Screen – String Handling Functions.

UNIT III **(12 hrs)**

User Defined Functions: Introduction – Need for User Defined Functions – Elements of User Defined functions – Definition of Functions – Return Values and their Types – Function Calls – Function Declaration – Recursion. **Structures and Unions:** Introduction – Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Unions. **Pointers:** Introduction – Understanding Pointers – Accessing the Address of a Variable – Declaring Pointer Variable – Initialization of Pointer Variable – Accessing a Variable through its Pointer.

UNIT IV **(12 hrs)**

Principles of Object Oriented Programming: Software Crisis – Basic Concept of Object Oriented Programming – Benefits of OOP – Object Oriented Languages – Application of OOP. **Beginning with C++**: What is C++ – Applications of C++ – A Simple C++ Program – Structure of C++ Program.**Tokens, Expressions and Control Structures:** Introduction – Tokens – Keywords – Identifiers and Constants – Basic Data Types – User Defined Data Types –Derived Data Types – Operators in C++ – Manipulators.**Functions in C++:** Introduction – The Main Function – Function Prototyping – Inline Function – Recursion – Function Overloading.

UNIT V **(12 hrs)**

Classes and Objects: Introduction – Specifying a Class – Defining Member Functions – Memory Allocation for Objects – Arrays of Objects – Objects as Function Arguments – Friendly Functions –Returning Objects. **Constructors and Destructors:** Introduction – Constructor – Parameterized Constructor –

Copy Constructor – Destructor.**Operator Overloading and Type Conversions:** Introduction – Defining Operator Overloading –Overloading Unary Operators – Overloading Binary Operators. **Inheritance:** Introduction – Defining Derived Class – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance.

TEXTBOOKS

1. E.Balagurusamy. *Programming in ANSI C.* Chennai: McGraw-Hill Education (India) Private Limited, 2019. **(UNITS I, II & III)**
2. E.Balagurusamy. *Object Oriented Programming with C++*. Chennai: McGraw-Hill Education (India) Private Limited, 2018. **(UNITS IV & V)**

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1. YashvantP.Kanetkar. *Let Us C*. New Delhi : BPB Publications Pvt Ltd, 2016
2. Byron S.Gottfried. *Programming with C.* New Delhi: Tata McGraw-Hill Education Pvt Ltd, 2014.
3. Herbert Schildt. *The Complete Reference.* New Delhi: Tata McGraw-Hill Education Pvt Ltd, 2003.

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2. http://www.freebookcentre.net/programming-books-download/Fundamentals-of-C-Programming-(PDF-72P).html
3. http://courses.washington.edu/css502/zander/Notes/08inheritance.pdf
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5. https://nptel.ac.in/content/storage2/106/104/106104128/MP4/mod01lec20.mp4

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF INFORMATION TECHNOLOGY
UG Programme – B.Sc. Mathematics
SEMESTER – III
ALLIED COURSE – III: PRACTICAL - PROGRAMMING IN C AND C++(21UMAA3P)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 50**
CREDIT : 1 **EXT. MARKS : 50**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to logical programming skills using the fundamentals and basics of C and C++ language.

Course Outcomes (CO)

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

CO1[K1]: identify the logical programming skills using the fundamentals and basics of C language

CO2[K2]: explain the concept of control statements, arrays and strings to execute a task

CO3[K3]: apply the techniques of functions to perform the task

CO4[K4]: examine the basic ideas about the classes and objects to compute square and cube operations

C05[K4]: inspect the concept of overloading and inheritance

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	-	1	-	2	-
CO2[K2]	2	2	-	1	-	2	1
CO3[K3]	2	2	1	1	1	2	1
CO4[K4]	2	2	2	1	1	2	1
CO5[K4]	2	2	2	1	1	2	1
Weightage of the course	10	10	05	05	03	10	04
Weighted percentage of Course contribution to POs	1.67	2.06	2.66	1.28	3.13	4.44	2.42

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

PROGRAMMING IN C

1. To perform the Arithmetic Operations using arithmetic operators.
2. To check the given number is odd or even using switch case statement.
3. To find the Biggest among Three Numbers using if else statement.
4. To implement number sorting using array.
5. To perform the sum of digits using function.
6. To calculate the factorial value by using recursion.
7. To perform the student mark list generation using Structure.

PROGRAMMING IN C++

8. To calculate square and cube values using Class and Objects.
9. To calculate area of given value using inline function
10. To calculate volume of given value using Function Overloading.
11. To overload Unary operator using Operator overloading.
12. To calculate the employee payroll using Inheritance.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme
SEMESTER - III
NON-MAJOR ELECTIVE COURSE - I: FUNDAMENTALS OF MATHEMATICS
(21UMAN31)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDIT : 1 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to some mathematical tools and methods that can be apply to real life problems.

Course Outcomes (CO)

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

CO1[K1]: state the elementary mathematical facts

CO2[K2]: explain the method of simplifying algebraic and rational expressions and the basic concepts related to sets, logarithms

CO3[K3]: solve linear equations and problems on sets, permutations and combinations

CO4[K4]: investigate the general term of Arithmetic and Geometric progression

CO5[K4]: analyze different forms of a set and various set theoretic operations

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	1	-	-	2	-	-	-
CO2[K2]	2	1	-	2	-	1	1
CO3[K3]	2	2	-	2	-	2	2
CO4[K4]	2	1	-	1	-	1	1
CO5[K4]	2	1	-	1	-	1	1
Weightage of the course	09	05	-	08	-	05	05
Weighted percentage of Course contribution to POs	1.5	1.03	0	2.05	0	2.22	3.03

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(6 hrs)**

Introduction: Least Common Multiple (L.C.M) and Highest Common Factor (H.C.F) – Algebraic Symbolism – Rational Expressions.

UNIT II **(6 hrs)**

Equations – Linear Equations –Logarithms.

UNIT III **(6 hrs)**

Progressions: Arithmetic Progression – Geometric Progression – Population Growth.

UNIT IV **(6 hrs)**

Permutations and Combinations: Factorial Notation – Fundamental Principle – Permutations – Circular Permutations – Combinations.

UNIT V **(6 hrs)**

Set Theory: Introduction –Meaning – Definition – Notation – Representation of a Set – Forms of Sets - Set Operations – Venn Diagrams – Ordered Pairs – Cartesian Product.

TEXTBOOK

1. Bose, D. *An Introduction to Mathematical Methods*.New Delhi: Himalaya Publishing House, First Edition, 2009.

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Books

1. Manoharan, M. and Elango, C. *Business Mathematics.* Palani: Palani Paramount Publications, 2001.
2. Vittal, P.R. *Business Mathematics*. Chennai: Margham Publications, 1999.
3. Jeyaseelan, S.D. and Sundaresan, V. *An Introduction to Business Mathematics*. New Delhi: S. Chand & Company Ltd., 2003.

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2. https://www.slideshare.net/mobile/siking26/logarithms-11019206
3. https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.mathcentre.ac.uk/resources/uploaded/mc-ty-apgp-20091.pdf&ved=2ahUKEwjxlpP8laHvAh&usg=AOvVaw1HHTTQe496RZ2V_FquWcOI&cshid=1615222916938
4. https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.asu.edu/courses/mat142ej/sets_and_counting/powerpoints/sets_and_set_operations_dalesandro.ppt&ved=2ahUKEwiMtvywmaHvAhVM8XMBHS0KBsYQFjAKegQICBAC&usg=AOvVaw1KrdhRZzSf_yiLWUICUxie
5. https://www.onlinemath4all.com/word-problems-on-sets-and-venn-diagrams.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG PROGRAMME - B.Sc. Mathematics
SEMESTER - III
SKILL ENHANCEMENT COURSE - III: ASTRONOMY (21UMAS31)
(From 2021-2022 Batch onwards)

HOURS/WEEK : 2 **INT. MARKS : 40**
CREDITS : 2 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS : 100**

Preamble

This course introduces the learners to the basic identities of spherical trigonometry and some astronomical phenomenon.

Course Outcomes (CO)

On Successful completion of the course, the learners will be able to

CO1[K1]: describe astronomical objects and phenomenon

CO2[K2]: summarize the identities of spherical trigonometry

CO3[K3]: calculate various measures in horizon

CO4[K4]: examine the relationships between the trigonometric functions of sides and angles of a spherical triangle

CO5 [K4]: analyze the occurrence of astronomical twilight

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	1	-	2	-	-	-
CO2[K2]	3	1	-	2	-	-	-
CO3[K3]	3	2	1	2	-	1	1
CO4[K4]	2	2	1	2	-	1	1
CO5[K4]	2	2	1	2	-	2	1
Weightage of the course	13	08	03	10	-	04	03
Weighted percentage of Course contribution to POs	2.17	1.65	1.6	2.56	0	1.78	1.82

Based on the level of contribution('3'-High, '2'-Medium, '1'-Low,'-' No Correlation)

UNIT I **(6 hrs)**

Spherical Trigonometry: Sphere – Theorem "The Section of a Sphere by a Plane is a Circle" – Great Circles and Small Circles – Axis and Poles of a Circle –

Distance between Two Points on a Sphere – Angle between Two Circles – Secondaries – Angular Radius or Spherical Radius – Theorems i) The Points of Intersection of Two Great Circles are the Poles of the Great Circles joining their Poles (**without Proof**) (ii) The Angle between Two Great Circles is the Angle between the Tangents to the Circles at a Point of Intersection (**without Proof**) (iii) The Length of an Arc of a Small Circle is Equal to the Corresponding Arc on the Parallel Great Circle Multiplied by the Sine of its Spherical Radius (**without Proof**) – Spherical Figures - Spherical Triangle – Polar Triangle – Theorem "If A B C is the Polar Triangle of ABC then ABC is the Polar Triangle of A B C " – Relation between the Elements of a Spherical Triangle and its Polar Triangle – Some Properties of Spherical Triangles (**without proof**) – Principle of Duality - Colunar and Antipodal Triangles – Relations between the Sides and Angles of a Spherical Triangle – Cosine Formula – Sine Formula – Cotangent Formula – Supplemental Cosine Formula.

UNIT II **(6 hrs)**

Five Parts Formula – Functions of Half an Angle – Functions of Half a Side – Delambre's Analogies - Napier's Analogies – Right Angled Spherical Triangle – Theorem in Right Angled Spherical Triangle - Napier's Rules – Spherical Co-ordinates – Relations between the Spherical and Rectangular Co-ordinate (**without Proof**) – Worked Examples.

UNIT III **(6 hrs)**

Celestial Sphere, Diurnal Motion: Astronomy – Celestial Sphere – Diurnal Motion, Celestial Axis and Equator - Celestial Horizon – Zenith and Nadir – Celestial Meridian – Cardinal Points – Northern and Southern Hemispheres – Eastern and Western Hemispheres – Visible and Invisible Hemispheres – Declination Circles – Verticals – Parallactic Angle – Rising and Setting - Transit or Culmination – Due East and Due West – Due South and Due North – Annual Motion of the Sun, Ecliptic, Obliquity – First Point of Aries and First Point of Libra – Equinoxes and Solstices – Colures – Celestial Co-ordinates – Horizontal System –Equatorial System – Meridian System –Ecliptic System.

UNIT IV **(6 hrs)**

To Find the Relation between Right Ascension and Longitude of the Sun – To Trace the Changes in the Co-ordinates of the Sun in the Course of a Year – To Find the Longitude of the Sun on any Day –Worked Examples. **The Earth:** Experimental Proofs for the Rotation of Earth – Worked Examples – Dip of Horizon – To Find an Expression for Dip – To Find the Distance between Two Mountains whose Tops are Just Visible from Each Other – Effects of Dip – To Find the Acceleration in the Time of Rising of a Star Due to Dip - Worked Examples.

UNIT V **(6 hrs)**

Twilight – To Find the Duration of Twilight – To Find the Condition that Twilight may last Throughout Night – To Find the Number of Consecutive Days having Twilight Throughout Night – To Find the Duration of Twilight when it is Shortest - Civil, Nautical and Astronomical Twilights - Worked Examples

TEXTBOOK

1. Kumaravelu, S. and Susheela Kumaravelu. *Astronomy*. Nagercoil: Kumaravelu, S. Muruga Bhavanam, Revised and Enlarged Edition, 2011.

REFERENCES

Books

1. Smart,W.M. *Textbook on Spherical Astronomy*. Cambridge: Cambridge University Press. Sixth Edition.
2. Daniel A. Murray. *Spherical Trigonometry.* Mumbai: Longmans, Green and Company.
3. Dascom Greene, *An Introduction to Spherical and Practical Astronomy*. Boston Ginn & Company.

Web Sources

1. https://youtu.be/14-YsGiCNwI
2. https://youtu.be/KzemQqrs7lY
3. https://byjus.com/physics/difference-between-equinox-and-solstice/
4. https://proofwiki.org/wiki/Napier%27s_Cosine_Rule_for_Right_Spherical_Triangles
5. https://www.math10.com/en/university-math/spherical-triangle/spherical-triangle.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI

DEPARTMENT OF TAMIL

UG Programme - B.A./B.SC./BCA

SEMESTER-IV

பொதுத்தமிழ் - IV (21UTAL41)

(From 2021-2022 Batch onwards)

HOURS/WEEK: 6	**INT. MARKS : 40**
CREDITS : 3	**EXT. MARKS : 60**
DURATION : 90hrs	**MAX. MARKS: 100**

நோக்கம்

சங்க இலக்கியங்களின் மேன்மைகளையும் வாழ்வியல் அறங்களையும் மாணவர்களுக்கு எடுத்துரைப்பதையும் புதின இலக்கியத்தை அறிமுகப்படுத்துவதையும் நோக்கமாகக் கொண்டு இத்தாள் வடிவமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளை வெற்றிகரமாக முடித்தவுடன் மாணவர்கள்,

CO1[K1]: புதின இலக்கியவகைகளைஅடையாளம் காண்பர்.

CO2[K2]: சங்க இலக்கியங்களில் உள்ள அறக்கருத்துக்களை எடுத்துரைப்பர்.

CO3[K3]: அக,புற இலக்கணங்களைக் கற்பர்.

CO4[K4]: சங்க இலக்கியங்களின் வாயிலாக மக்களின் வாழ்க்கைமுறையினைப் பாகுபடுத்துவர்.

CO5[K5]: பண்டையதமிழ் இலக்கியஆளுமைகளைமதிப்பிடுவர்.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	-	-
CO2[K2]	2	1	-	2	-	-	-
CO3[K3]	2	2	-	2	1	-	1
CO4[K4]	2	2	1	2	1	1	-
CO5[K5]	2	2	1	2	-	1	1
Weightage of the course	10	8	2	9	2	2	2
Weighted percentage of Course contribution to POs	1.67	1.65	1.06	2.31	2.08	0.89	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

கூறு I **(18 hrs)**

எட்டுத்தொகை இலக்கியவரலாறு - **குறிஞ்சித்திணை - நற்றிணை:** ஓங்குமலைநாட (55) - கழுதுகால்கிளர (255). **முல்லைத்திணை - குறுந்தொகை:** பெருந்தண் மாரிப் (94), மடவவாழி மஞ்ஞை (251). **மருதத்திணை கலித்தொகை:** அகன்துறை அணிபெற (73), புள்இமிழ் அகல் வயல்(79). **நெய்தல் திணை - ஐங்குறுநூறு:** தாய்க்கு உரைத்த பத்து (10பாடல்கள்). **பாலைத்திணை- அகநானூறு:** வளம் கெழுதிருநகர்ப் (17), கடல் முகந்து கொண்டகமஞ்சூல்(43).

பரிபாடல்: வையை - வளிபொருமின்னொடு(12). **புறநானூறு**: இரும்பனைவெண்தோடு (45) - எமக்கேகலங்கல் (298), **பதிற்றுப்பத்து:** ஐந்தாம்பத்தில் மாமலைமுழக்கின;.

கூறு II **(18 hrs)**

பத்துப்பாட்டு இலக்கியவரலாறு- **பத்துப்பாட்டு:**குறிஞ்சிப்பாட்டு ((முழுவதும்)

கூறு III **(18 hrs)**

சங்கமருவியகால இலக்கியவரலாறு- **திரிகடுகம்:**தற்புகழ்ச்சிக்குக் கூடாதவை -தொல் அவையும ் (8) - புகழுக்குரிய மூவர் - மண்ணின் மேல் வான்(16), வீடுபேறு அடையும் வழிகள் - பற்று(22) - கற்றறிந்தார் கடமை -நுண்மொழி நோக்கிப் பொருள் (32), நல்லோர் நெறி- சான்றாருள் சான்றான் எனப்படுதல் (82). **நாலடியார்**: கூடாநட்பு (231-240). **இனியவைநாற்பது**: உடையான் வழக்கினிது (2) -மானம் அழிந்தபின்(13) - குழவி தளர்நடை(14) - பிறன்கைப் பொருள்வெளவான்(21) - வருவாய் அறிந்து (22). **இன்னாநாற்பது:** உண்ணாதுவைக்கும்(16) - மாரிநாள் கூவும்(20) - யானையில் மன்னாக் (22) - சிறையில்லா மூதூரின்(23) - ஏமம்இல் மூதூர்(24). **திருக்குறள்**: அறத்துப்பால் - புகழ், இன்பத்துப்பால் - குறிப்பறிதல் (அதிகாரங்கள் முழுவதும்).

கூறு IV **(18 hrs)**

புதின இலக்கியவரலாறு,கூட்டுக்குஞ்சுகள் - இராஜம் கிரு ்ணன்.

கூறு V **(18 hrs)**

இலக்கணம் - தொல்காப்பியர் குறிப்பிடும் திணைக்கோட்பாடுகள் - அகப்பொருள் - புறப்பொருள் - உள்ளுறை - இறைச்சி - விண்ணப்பம் - புகார் - பாராட்டுக் கடிதங்கள் - அறிக்கை - செய்திஎழுதுதல்.

பாடநூல்கள்

1. *தொகுப்பு நூல்,* தமிழியல்துறை, ஸ்ரீ காளீஸ்வரி கல்லூரி (தன்னாட்சி), சிவகாசி.
2. இராஜம் கிரு ்ணன். *கூட்டுக்குஞ்சுகள்,* நியூ செஞ்சுரி புத்தக நிலையம், சென்னை, 2011.
3. வாசுதேவன், கா. *பன்முகநோக்கில் தமிழ் இலக்கியவரலாறு,*தேவன் பதிப்பகம், திருச்சிராப்பள்ளி, 2017.

பார்வை நூல்கள்

1. சுப்பிரமணியன், க. *சங்ககாலச் சமுதாயம்,* ஜனசக்தி அச்சகம், சென்னை, 1993.
2. பாலசுப்பிரமணியன் சிற்பி & நீலபத்மநாபன் (பதி.),*புதியதமிழ் இலக்கிய வரலாறு.* மணமலர்ப் பதிப்பகம், சென்னை,2000.
3. பாலசுப்பிரமணியன், சி.*தமிழ் இலக்கிய வரலாறு,* மண்மலர்ப் பதிப்பகம், சென்னை, 2003.
4. மோகன், இரா.*பத்துப்பாட்டு மூலமும் உரையும்,* நியூ செஞ்சுரி புத்தக நிலையம், சென்னை, 2004.

வலைப்பதிவுகள் (Web Sources)

1. https://youtu.be/Gv84KCknV_g
2. https://youtu.be/B42bzKeb-aI
3. https://youtu.be/sLE4yH-7PeE
4. https://youtu.be/wdlw8CyEBP8

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme - B.A./B.SC./BCA
SEMESTER- IV
COMMUNICATIVE ENGLISH - IV (21UENL41)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS: 100**

Preamble

This course helps the learners to develop their communication skills in English through listening, reading, speaking and writing practices.

Course Outcomes (CO)

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

CO1[K1]: relate and state ideas by listening to lectures and reading narratives

CO2[K2]: demonstrate effective speaking skills through group discussions and answering interview questions

CO3[K3]: apply knowledge of word power and grammar rules through drafting Memorandum, Minutes of the meetings and Agenda

CO4[K4]: analyze tales from Shakespeare to develop language skills through literature

CO5[K6]: construct grammatically correct and meaningful sentences for Covering letters and Resume Writing and thereby preparing students towards employability

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	-	-
CO2[K2]	2	1	-	1	-	-	-
CO3[K3]	2	2	1	2	1	1	1
CO4[K4]	2	2	1	2	1	1	1
CO5[K6]	2	3	1	2	-	1	1
Weightage of the course	10	09	03	08	02	03	03
Weighted percentage of Course contribution to POs	1.67	1.85	1.6	2.05	2.08	1.33	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I - LISTENING AND SPEAKING **(18 hrs)**

LISTENING

Listening to lectures

Listening to commentaries

Listening to narratives

SPEAKING

Welcome address and Vote of Thanks

Role Play

Anchoring

Group discussion

Interview questions

UNIT II - READING AND WRITING **(18 hrs)**

Reading Newspaper- articles, letter to editor, sports and entertainment

WRITING

Drafting:

Memorandum

Minutes of the meeting

Agenda

Resume writing & Covering letter

UNIT III - WORD POWER **(18 hrs)**

Words often confused

Analogy

Words related to- Health and Medicine, Pleasant and Unpleasant feelings, Success and Failure, Science and Technology and Travel

UNIT IV - GRAMMAR **(18 hrs)**

Identify Phrases and Clauses

Transformation of Sentences: Reported speech, Simple, Compound and Complex Sentences

Error Spotting

UNIT V - LANGUAGE THROUGH LITERATURE **(18 hrs)**

TALES FROM SHAKESPEARE

Romeo and Juliet

A Midsummer Night's Dream

The Merchant of Venice

King Lear

Macbeth

TEXTBOOKS

1. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
2. Pillai, Radhakrishna G., and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.
3. Pillai, Radhakrishna G. *Emerald English Grammar and Composition.* Chennai: Emerald Publishers, 2016.

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1. *Life Skills (Jeevan Kaushal) Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
2. Radha, Alamelu and Kasthuri Bai. *Situational Grammar and Composition.* Chennai: New Century Book House Pvt. Ltd, 2008.
3. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
4. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.

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2. https://steffesziri.files.wordpress.com/2019/04/illustrated-stories-from-shakespeare-0.pdf
3. https://www.talkenglish.com/lessonindex.aspx
4. https://www.englishhelper.com/
5. https://www.englishpage.com/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - IV
CORE COURSE - VII: MECHANICS (21UMAC41)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the relationships among force, matter and motion.

Course Outcomes (CO)

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

CO1[K2]: explain the fundamental concepts and principles of Mechanics

CO2[K3]: apply the principles and methods to find the resultant of forces on bodies concerned in statics

CO3[K4]: examine the velocity and acceleration of moving particles in various forms of motion

CO4[K4]: investigate the motion of a particle under the action of central forces

CO5[K5]: evaluate the kinematic quantities of projectile motion

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	1	-	2	-	-	-
CO2[K3]	3	2	1	2	-	1	-
CO3[K4]	3	3	1	2	-	1	1
CO4[K4]	3	3	1	2	-	1	1
CO5[K5]	3	3	1	2	-	1	1
Weightage of the course	15	12	04	10	-	04	03
Weighted percentage of Course contribution to POs	2.5	2.47	2.13	2.56	0	1.78	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I **(12 hrs)**

Forces Acting at a Point: Definition of Resultant and Components – Simple Cases of Finding the Resultant – Parallelogram of Forces – Analytical

Expression for the Resultant of Two Forces acting at a Point – Triangle of Forces – Perpendicular Triangle of Forces – Converse of the Triangle of Forces – The Polygon of Forces – Lami's Theorem – An Extended Form of the Parallelogram Law of Forces – Resolution of a Force – Components of a Force Along Two Given Directions – Theorem on Resolved Parts – Resultant of any Number of Forces Acting at a Point: Graphical Method – Resultant of any Number of Coplanar Forces Acting at a Point: Analytical Method.
(Text Book I – Page No: 6 – 10, 12 – 26, 28 – 33, 36 – 45)

UNIT II **(12 hrs)**

Parallel Forces and Moments: Introduction – Resultant of Two Like Parallel Forces Acting on a Rigid Body – Resultant of Two Unlike and Unequal Parallel Forces Acting on a Rigid Body – Resultant of a Number of Parallel Forces Acting on a Rigid Body – Conditions of Equilibrium of Three Coplanar Parallel Forces – Centre of Two Parallel Forces – Moment of a Force – Physical Significance of the Moment of a Force – Geometrical Representation of a Moment – Sign of the Moment – Unit of Moment – Varigon's Theorem of Moments – Generalised Theorem of Moments (Principle of Moments).
(Text Book I – Page No: 52 – 59, 61 – 70)

UNIT III **(12 hrs)**

Projectiles: Introduction – Definitions – Two Fundamental Principles – Path of a Projectile – Characteristics of the Motion of a Projectile – The Path of a Projectile when a Particle is Projected Horizontally – The Horizontal Range of a Projectile – Two Possible Directions to obtain a Given Horizontal Range – The Velocity of the Projectile in Magnitude and Direction at the End of Time t – The Velocity at any Point P of a Projectile.
(Text Book II – Page No: 139 – 151, 156 – 161, 163 -167)

UNIT IV **(12 hrs)**

Impulsive Forces: Impulse – Impulsive Force – Impact of Two Bodies – Loss of Kinetic Energy in Impact – Motion of a Shot and Gun – Impact of Water on a Surface. **Collision of Elastic Bodies:** Introduction – Definitions – Fundamental Laws of Impact – Impact of a Smooth Sphere on a Fixed Smooth Plane – Direct Impact of Two Smooth Spheres – Loss of Kinetic Energy due to Direct Impact of Two Smooth Spheres – Oblique Impact of Two Smooth Spheres - Loss of Kinetic Energy due to Oblique Impact of Two Smooth Spheres.
(Text Book II – Page No: 201 - 211, 215 – 229, 232 – 241, 244 - 248)

UNIT V **(12 hrs)**

Motion Under the Action of Central Forces: Introduction – Velocity and Acceleration in Polar Coordinates – Equations of Motion in Polar Coordinates – Note on the Equiangular Spiral – Motion under a Central Force – Differential

Equation of Central Orbits – Perpendicular from the Pole on the Tangent: Formulae in Polar Coordinates – Pedal Equation of the Central Orbit – Pedal Equation of the some of the Well – Known Curves – Velocities in a Central Orbit. (Text Book II – Page No: 356 – 367, 371 – 377)

TEXTBOOKS

1. Venkataraman, M.K. *Statics*. Tiruchi: Agasthiar Publications, Twelveth Edition, 2007. **(UNITS I & II)**
2. Venkataraman, M.K. *Dynamics*. Tiruchi: Agasthiar Publications, Twelveth Edition, 2006. **(UNITS III, IV & V)**

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1. Duraipandian, P. Laxmi Duraipandian and Muthamizh Jayapragasam. *Mechanics*. New Delhi : S.Chand and Company Ltd, 2012.
2. Ray, M. and Sharma, G.C. *A Text Book on Dynamics*. New Delhi : S.Chand & Company Ltd, 2002.
3. Viswanatha Naik, K. and Kasi, M.S. *Dynamics.* Chennai: Emerald Publishers, 2001.

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3. https://www.ijesird.com/DECEMBER_5.PDF
4. https://ocw.mit.edu/courses/aeronautics-and-astronautics/16-07-dynamics-fall-2009/lecture-notes/MIT16_07F09_Lec09.pdf
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - IV
CORE COURSE - VIII: SAMPLING THEORY (21UMAC42)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the sampling methods that can be used to estimate parameters of the population from the sample drawn from the population.

Course Outcomes (CO)

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

CO1[K2]: explain the important elements of sampling and the different sampling methods

CO2[K3]: apply sampling techniques to draw inferences about a population in statistical investigation

CO3[K3]: apply the statistical tool "Analysis of Variance" for testing the significance at different level of significance

CO4[K4]: analyze the various methods for obtaining estimation of population parameters

CO5[K5]: determine the optimum test statistic in solving Testing of Hypothesis problems

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	-	2	-	-	-
CO2[K3]	3	2	-	2	1	1	-
CO3[K3]	3	2	-	2	1	1	-
CO4[K4]	3	3	1	1	1	2	1
CO5[K5]	3	3	1	1	1	2	1
Weightage of the course	15	12	02	08	04	06	02
Weighted percentage of Course contribution to POs	2.5	2.47	1.06	2.05	4.17	2.67	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Sampling and Large Sample Tests: Sampling Introduction – Types of Sampling – Parameters and Statistics – Tests of Significance – Null Hypothesis – Errors in Sampling – Critical Region and Level of Significance – Tests of Significance for Large Samples – Sampling of Attributes – Sampling of Variables – Unbiased Estimates for Population Mean (μ) and Variance σ^2 - Standard Error of Sample Mean – Test of Significance for Single Mean – Test of Significance for Difference of Means - Test of Significance for the Difference of Standard Deviations.

UNIT II **(12 hrs)**

Exact Sampling Distribution (Chi-square Distribution): Chi-square Variate – Derivation of the Chi-square Distribution – M.G.F. of 3^2-Distribution - Chi-square Probability Curve – Applications of Chi-square Distribution – Yate's Correction.

UNIT III **(12 hrs)**

Exact Sampling Distributions (continued) (t, F and Z Distributions): Introduction – Student's 't' (Definition) – F-statistic (Definition).

UNIT IV **(12 hrs)**

Theory of Estimation: Introduction – Characteristics of Estimators – Methods of Estimation – Rao-Cramer Inequality. **Testing of Hypothesis:** Introduction – Statistical Hypothesis - Simple and Composite – Steps in Solving Testing of Hypothesis Problem – Optimum Tests under Different Situations – Neyman J and Pearson, E.S.Lemma.

UNIT V **(12 hrs)**

Analysis of Variance: Introduction – One-way Classification – Two-way Classification.

TEXTBOOK

1. Gupta, S.C. and Kapoor, V.K. *Elements of Mathematical Statistics.* New Delhi: Sultan Chand & Sons, 2006.

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1. Arumugam, S. and Thangapandi Isaac, A. *Statistics*. Palayamkottai: New Gamma Publishing House, 2009.
2. Gupta, S.C. and Kapoor, V.K. *Fundamentals of Mathematical Statistics*. New Delhi: Sultan Chand and Sons, 2007.
3. Kapur, J.N. and Saxena, H.G. *Mathematical Statistics*. New Delhi: S.Chand & Company LTD, 1989.

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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF INFORMATION TECHNOLOGY
UG Programme – B.Sc. Mathematics
SEMESTER – IV
ALLIED COURSE – IV: MULTIMEDIA AND ITS APPLICATIONS (21UMAA41)
(From 2021-2022 Batch onwards)

HOURS/WEEK : 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners with the basic concepts of multimedia, underlying principles and various techniques of multimedia applications.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K1]: state the basic features of multimedia elements
CO2[K2]: explain the various compression techniques of text and image
CO3[K3]: apply the different methods to implement 2D & 3D animations
CO4[K4]: justify the concepts and techniques of editing a video
CO5[K4]: examine the fundamental working principles of audio

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	-	2	-	2	-
CO2[K2]	2	2	-	2	-	2	-
CO3[K3]	2	2	-	2	1	2	1
CO4[K4]	2	2	-	2	1	2	1
CO5[K4]	2	2	-	2	1	2	1
Weightage of the course	10	10	-	10	03	10	03
Weighted Percentage of Course contribution to POs	1.67	2.06	0	2.56	3.13	4.44	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(12 hrs)**

Multimedia – An Overview: Introduction – Multimedia Presentation and Production – Characteristics of a Multimedia Presentation – Uses of Multimedia – Promotion of Multimedia Based Content – Steps for Creating a Multimedia Presentation.

UNIT II **(12 hrs)**

Text: Introduction – Types of Text – Unicode Standard – Font – Insertion of Text – Text Compression – File Format. **Image:** Introduction – Image Type – Seeing Color – Color Model – Basic Steps for Image Processing – Specification of Digital Image.

UNIT III **(12 hrs)**

Audio: Introduction – Acoustics – Nature of Sound Waves – Fundamental Characteristics of Sound – Musical Note and Pitch – Psycho Acoustics – Elements of Audio System – Microphone – Amplifier – Loud Speaker – Audio Mixer – Digital Audio – Audio Transmission – Audio Recording Devices.

UNIT IV **(12 hrs)**

Video: Introduction – Analog Video Camera – Transmission of Video Signal – Video Signal Formats – Digital Video Standards – PC Video – Video Recording Formats and Systems – Video File Formats and CODECs – Video Editing – Video Editing Software.

UNIT V **(12 hrs)**

Animation: Introduction – Historical Background – Uses of Animation – Key Frame and Tweening – Types of Animation – Computer Assisted Animation – Creating Movement – Principles of Animation – Some Techniques of Animation.

TEXTBOOK

1. Ranjan Parekh. *Principles of Multimedia*. New Delhi: Tata McGraw-Hill Education Private Limited, 2011.

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1. Tay Vaughan. *Multimedia: Making it work.* New Delhi: Tata McGraw-Hill, 2001.
2. Ramesh Bangia. *Introduction to Multimedia.* Chennai: Laxmi Publications Pvt. Ltd, 2015.
3. Gaurav Bhatnagar, Shikha Mehta and SugataMitra. *Introduction to Multimedia Systems.* New Delhi: Academic Press, 2002.

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3. https://ayomenulisfisip.files.wordpress.com/2018/01/introduction-to-multimedia.pdf
4. https://jianhua.cis.k.hosei.ac.jp/course/mm/Lesson04.pdf
5. https://nptel.ac.in/courses/117/105/117105083/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF INFORMATION TECHNOLOGY
UG Programme – B.Sc. Mathematics
SEMESTER – IV
ALLIED COURSE – IV: PRACTICAL - MULTIMEDIA AND ITS APPLICATIONS (21UMAA4P)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 50**
CREDIT : 1 **EXT. MARKS : 50**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course enables the learners to enhance the creative knowledge and professional designing skills by implementing the various Photoshop tools.

Course Outcomes (CO)

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

CO1[K3]: use the basic tools for applying color variations

CO2[K3]: apply the benefits of professional tools for designing the banner

CO3[K3]: draw a greeting card design by using the advanced tools

CO4[K6]:create a new animation by implementing the techniques of image ready

CO5[K6]: design and develop new professional logo

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K3]	2	2	-	2	-	2	-
CO2[K3]	2	2	-	2	1	2	-
CO3[K3]	2	2	-	2	1	2	1
CO4[K6]	1	2	-	2	1	2	1
CO5[K6]	1	2	-	2	1	2	1
Weightage of the course	08	10	-	10	04	10	03
Weighted Percentage of Course contributio nto POs	1.34	2.06	0	2.56	4.17	4.44	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

1. To convert black and white picture to color.
2. To develop passport size photo.
3. To design ID card.
4. To design flex banner.
5. To design greeting card.
6. To apply mirror effects.
7. To design book wrapper and water mark.
8. To design a professional logo.
9. To create simple animation using image ready.
10. To animate story using image ready.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - IV
SELF PACED LEARNING - SWAYAM COURSE - BASIC CALCULUS 1 AND 2
(21UMAM41)
(From 2021-2022 Batch onwards)

CREDITS : 2 **EXT. MARKS : 100**
DURATION : 8 Weeks **MAX. MARKS: 100**

Preamble

This course provides the learners with an opportunity for a lifelong learning by meeting the demand in terms of knowledge, skills, and competencies.

Course outcomes (CO)

On successful completion of this course learners will be able to

CO1[K1]: identify the background and the key words in Basic Calculus 1 and 2
CO2[K2]: demonstrate independent and self-paced learning for clear understanding of the concept
CO3[K3]: develop computer and communication skills to broaden their knowledge in the course
CO4[K3]: use high quality reading resources, communication tools and technology to send assignments and to take up test
CO5[K4]: analyse critically and apply technical skills to comprehend the ideas prescribed

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	1	2	-	-	2
CO2[K2]	3	2	1	1	-	-	2
CO3[K3]	3	2	1	2	1	1	1
CO4[K3]	2	2	1	2	-	-	1
CO5[K4]	2	2	1	2	-	1	1
Weightage of the course	13	10	05	09	01	02	07
Weighted percentage of Course contribution to POs	2.17	2.06	2.66	2.31	1.04	0.89	4.24

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

WEEK 1

Algebra of Real Numbers – Set of Axioms – Completeness – Density – Decimal Representation of Real Numbers.

WEEK 2

Convergence of Sequences – Properties of Limit – Sandwich Theorem – Monotonic Sequences – Cantor's Completeness Principle – Bolzano-Weierstrass Theorem – Cauchy's Completeness.

WEEK 3

Convergence of Series – Comparison Test – Root Test – Ratio Test – Power Series – Leibniz's Condition.

WEEK 4

Continuity – Intermediate Value Theorem – Properties of Continuous Functions.

WEEK 5

Differentiation – Rolle's Theorem – Mean Value Theorem – Higher Derivatives – Taylor Theorem.

WEEK 6

Curve Tracing – Applications of Derivatives.

WEEK 7

Integrations.

WEEK 8

Applications of Integration.

REFERENCE

Book

1. Thomas and Finney. T. Apostol *Calculus I*

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - IV
SELF PACED LEARNING - SWAYAM COURSE - MULTIVARIABLE CALCULUS
(21UMAM42)
(From 2021-2022 Batch onwards)

CREDITS : 2 **EXT. MARKS : 100**
DURATION : 8 Weeks **MAX. MARKS: 100**

Preamble

This course provides the learners with an opportunity for a lifelong learning by meeting the demand in terms of knowledge, skills, and competencies.

Course outcomes (CO)

On successful completion of this course learners will be able to

CO1[K1]: identify the background and the key words in Multivariable calculus
CO2[K2]: demonstrate independent and self-paced learning for clear understanding of the concept
CO3[K3]: develop computer and communication skills to broaden their knowledge in the course
CO4[K3]: use high quality reading resources, communication tools and technology to send assignments and to take up test
CO5[K4]: analyse critically and apply technical skills to comprehend the ideas prescribed

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	1	2	-	-	2
CO2[K2]	3	2	1	1	-	-	2
CO3[K3]	3	2	1	2	1	1	1
CO4[K3]	2	2	1	2	-	-	1
CO5[K4]	2	2	1	2	-	1	1
Weightage of the course	13	10	05	09	01	02	07
Weighted percentage of Course contribution to POs	2.17	2.06	2.66	2.31	1.04	0.89	4.24

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

WEEK 1

Limits – Continuity and Partial Derivatives of Multivariable Functions.

WEEK 2

Differentiability and Chain Rule.

WEEK 3

Change of Variables – Euler's Theorem – Tangent Planes – Normal Lines and Extreme Values.

WEEK 4

Taylor's Theorem – Error Approximation – Polar Curves and Multiple Integrals.

WEEK 5

Change of Order and Change of Variables in Multiple Integral.

WEEK 6

Beta and Gamma Functions.

WEEK 7

Normal Vector and Potential Field.

WEEK 8

Vector Identities and Line Integral.

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2. Jain, R.K. and Iyenger, S.R.K. *Advanced Engineering Mathematics,* Narosa Publishing House 2nd Edition, 2005.
3. Weir, M.D., Hass, J. and Giordano, F.R. *Thomas' Calculus,* Pearson Education, 11th Edition, 2008.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme
SEMESTER - IV
NON MAJOR ELECTIVE COURSE - II: INTRODUCTION TO NUMERICAL COMPUTATIONS (21UMAN41)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDIT : 1 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to some basic techniques for efficient numerical solution of problems in science and analyze approximation errors in the process of computation.

Course Outcomes (CO)

On Successful completion of the course, the learners will be able to

CO1[K1]: state the elementary concepts of numerical methods
CO2[K2]: explain the methods for solving mathematical problems numerically
CO3[K3]: apply numerical methods to solve algebraic, transcendental and simultaneous equations
CO4[K4]: examine the method of finding the curve of best fit for the given data
CO5[K4]: analyze the method of interpolation for finding the unknown data value between known data values

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	1	-	-	2	-	-	-
CO2[K2]	2	1	-	2	-	1	1
CO3[K3]	2	2	-	2	-	2	2
CO4[K4]	2	1	-	1	-	1	1
CO5[K4]	2	1	-	1	-	1	1
Weightage of the course	09	05	-	08	-	05	05
Weighted percentage of Course contribution to POs	1.5	1.03	0	2.05	0	2.22	3.03

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low,'-' No Correlation)

UNIT I **(6 hrs)**

Empirical Laws and Curve Fittings: Introduction – The Linear Law – Laws Reducible to Linear Law – Evaluation of the Constants by method of Group Averages – Equation Involving the Constants.

UNIT II **(6 hrs)**

Principle of Least Squares – Fitting a Straight Line by Method of Least Squares – Fitting an Exponential Curve – Fitting a Curve of the Form $Y= ax^b$ – Method of Moments.

UNIT III **(6 hrs)**

Solution of Numerical Algebraic and Transcendental Equations: Bisection Method – Iteration Method or Method of Successive Approximations – The Condition for the Convergence of the Method – Regula Falsi Method or Method of False Position – Newton's Method of Successive Approximation or Newton- Raphson Method – Convergence of Newton's Method and Rate of Convergence.

UNIT IV **(6 hrs)**

Interpolation: Introduction – Newton – Gregory Forward Interpolation Formula – Newton – Gregory Backward Interpolation Formula.

UNIT V **(6 hrs)**

Central Difference Tables: Central Difference Tables – Central Difference Interpolation Formulae. **Interpolation with Unequal Intervals:** Introduction – Divided Differences – Newton's Interpolation Formula for Unequal Intervals or Newton's Divided Difference Formula – Lagrange's Interpolation Formula.

TEXTBOOK

1. Kalavathy, S. *Numerical Methods.* Chennai: Vijay Nicole Imprints Private Limited, 2004.

REFERENCES

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1. Arumugam, S., Thangapandi Issac, A. and Somasundran, A. *Numerical Analysis*. Palayamkottai: New Gamma Publishing house, November 2003.
2. Kandasamy, P. and thilagavathy, K. *Calculus of finite differences and Numerical Analysis*. New Delhi: S.Chand and Company Ltd., First Edition, 2003.
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - IV
SKILL ENHANCEMENT COURSE - IV: STATISTICAL DISTRIBUTIONS
(21UMAS41)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDITS 2 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to some special probability distributions that have been successfully applied in a wide variety of decision situations.

Course Outcomes (CO)

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

CO1[K2]: explain the basic concepts of discrete probability distributions and continuous probability distributions

CO2[K3]: compute the various parameters of probability distributions

CO3[K3]: derive the moment generating function and cumulant generating function of probability distributions

CO4[K4]: interpret the recurrence relation for parameters of distributions

CO5[K5]: determine the limiting form of distributions of random variables

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K2]	2	2	-	2	-	-	-
CO2 [K3]	2	2	-	2	1	1	-
CO3 [K3]	2	2	-	2	1	1	-
CO4 [K4]	2	3	1	1	1	1	1
CO5 [K5]	2	3	1	1	1	1	1
Weightage of the course	10	12	02	08	04	04	02
Weighted percentage of Course contribution to POs	1.67	2.47	1.06	2.05	4.17	1.78	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(6 hrs)**

Special Discrete Probability Distributions: Introduction – Discrete Uniform Distribution – Bernoulli Distribution – Binomial Distribution.

UNIT II **(6 hrs)**

Poisson Distribution - Negative Binomial Distribution.

UNIT III **(6 hrs)**

Geometric Distribution – Hyper-Geometric Distribution – Multinomial Distribution – Power Series Distribution.

UNIT IV **(6 hrs)**

Special Continuous Probability Distributions: Introduction – Normal Distribution.

UNIT V **(6 hrs)**

Rectangular (or Uniform) Distribution – Triangular Distribution – Gamma Distribution – Beta Distribution of First Kind – Beta Distribution of Second Kind – Exponential Distribution.

TEXTBOOK

1. Gupta, S.C. and Kapoor, V.K. *Fundamentals of Mathematical Statistics*. New Delhi: Sultan Chand and Sons, 2007.

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1. Arumugam, S. and Thangapandi Isaac, A. *Statistics*. Palayamkottai: New GammaPublishing House, 2009.
2. Kapur, J.N. and Saxena, H.G. *Mathematical Statistics*. New Delhi: S.Chand & Company LTD, 1989.
3. Irwin Miller and Marylees Miller. *John E.Freund's Mathematical Statistics.* New Delhi: Prentice-Hall of India Private Limited, 2003.

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5. https://youtu.be/6x1pL9Yov1k

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
UG Programme
SEMESTER III & IV
PART V – EXTENSION
(From 2021 -2022 Batch Onwards)

HOURS/WEEK: 2
CREDIT 1
DURATION : 60 hrs **INT. MARKS: 100**

Preamble

This course aims to promote holistic development among the youth by defining their roles and responsibilities towards ones family and their society and enables them to acquire professional skills and ethics.

Course Outcomes (CO)

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

CO1 [K1]: recognize the importance of community service through training and education

CO2 [K2]: interpret ecological concerns, consumer rights, gender issues & legal protection

CO3 [K3]: develop team spirit, verbal/non verbal communication and organizational ethics by participating in community service

CO4 [K4]: examine the necessity of professional skills & community-oriented services for a holistic development

CO5 [K6]: create awareness on human rights, legal rights, First Aid, Physical fitness and wellbeing

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	-	-	2	2	1	1
CO2 [K2]	2	1	-	2	1	1	1
CO3 [K3]	2	-	-	1	2	2	1
CO4 [K4]	1	1	1	1	2	2	1
CO5 [K6]	1	-	-	1	2	2	1
Weightage of the course	08	02	01	07	09	08	05
Weighted percentage of Course contribution to Pos	1.34	0.41	0.53	1.79	9.38	3.56	3.03

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

Details of the Courses

1	National Cadet Corps (NCC)	– 190 hrs
2	National Service Scheme (NSS)	– 240 hrs
3	Physical Education	
4	Red Ribbon Club (RRC)	
5	Youth Red Cross (YRC)	
6	Fine Arts Club	
7	Library and Information Service Club	
8	Yoga Club	
9	ECO Club	
10	Consumer Club	
11	Human Rights Club	
12	Women Empowerment Cell	
13	Legal Awareness League	

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - V
CORE COURSE - IX: ABSTRACT ALGEBRA (21UMAC51)
(From 2021-2022 Batch onwards)

HOURS/WEEK : 5 **INT.MARKS : 40**
CREDITS : 5 **EXT.MARKS : 60**
DURATION : 75 hrs **MAX.MARKS : 100**

Preamble

This course introduces the learners to the abstract concepts of the algebraic structures groups and rings.

Course Outcomes (CO)

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

CO1[K2]: explain the fundamental concepts of groups and rings

CO2[K3]: apply the abstract concepts to produce proofs of results that arise in the context of groups and rings

CO3[K3]: apply the composition operation of permutation group to compute inverse of a permutation and express a permutation as a product of disjoint cycles / transpositions

CO4[K4]: analyze the properties of groups, subgroups, rings, subrings

CO5[K5]: determine the group/ring axioms on a set and the isomorphism of groups / rings

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	-	2	-	-	-
CO2[K3]	3	2	1	2	-	1	-
CO3[K3]	3	2	1	2	-	1	-
CO4[K4]	3	2	2	2	-	1	1
CO5[K5]	3	2	2	2	-	1	1
Weightage of the course	15	10	06	10	-	04	02
Weighted percentage of Course contribution to POs	2.5	2.06	3.19	2.56	0	1.78	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(15 hrs)**

Groups: Introduction **-**Definition and Examples – Elementary Properties of a Group – Equivalent Definitions of a Group – Permutation Groups – Subgroups.

UNIT II **(15 hrs)**

Cyclic Groups – Order of an Element – Cosets and Lagrange's Theorem – Normal Subgroups and Quotient Groups – Isomorphism – Homomorphisms.

UNIT III **(15 hrs)**

Rings: Definition and Examples – Elementary Properties of Rings – Isomorphism – Types of Rings – Characteristic of a Ring – Subrings.

UNIT IV **(15 hrs)**

Ideals – Quotient Rings – Maximal and Prime Ideals – Homomorphism of Rings.

UNIT V **(15 hrs)**

Field of Quotients of an Integral Domain – Ordered Integral Domain – Unique Factorization Domain (U.F.D) – Euclidean Domain.

TEXTBOOK

1. Arumugam, S. and Thangapandi Isaac, A. *Modern Algebra*. Chennai: Sci Tech Publications (India) Pvt. Ltd., 2008.

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1. Surjeet Singh and Qazi Zameeruddin. *Modern Algebra*. New Delhi: Vikas Publishing House PVT LTD, 2003.
2. Santiago, M.L. *Modern Algebra.* New Delhi: Tata McGraw-Hill Publishing Company Limited, 2001.
3. Sharma, S.D. *Modern Algebra*. Meerut: Kedar Nath Ram Nath & Co. Publishers,1997.

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2. https://www.youtube.com/watch?v=S8F4xsmYXCs&list=PLEAYkSg4uSQ3AaON5oCbS6ecwKsoopBN3&index=15
3. https://nptel.ac.in/content/storage2/courses/111104026/lecture27.pdf
4. https://www.youtube.com/watch?v=-tP-cxErI-A&list=PLEAYkSg4uSQ1Yhxu2U-BxtRjZElrfVVcO
5. https://math.okstate.edu/people/binegar/3613/3613-l14.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - V
CORE COURSE - X: REAL ANALYSIS (21UMAC52)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 40**
CREDITS : 5 **EXT. MARKS : 60**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the fundamental concepts of mathematical analysis in real number system and its properties.

Course Outcomes (CO)

On Successful completion of the course, the learners will be able to

CO1[K2]: explain the basic concepts of real analysis and proof techniques in analysis

CO2[K3]: apply the abstract concepts to produce proofs of results that arise in the context of real analysis

CO3[K4]: analyze the behavior of absolutely convergent and conditionally convergent series

CO4[K4]: analyze the properties connectedness, completeness and compactness in a metric space

CO5[K5]: determine continuity, discontinuity and uniform continuity of the functions on the real line

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	-	1	-	-	-
CO2[K3]	3	2	-	1	-	-	-
CO3[K4]	3	2	2	2	-	1	-
CO4[K4]	3	2	2	2	-	1	1
CO5[K5]	3	2	2	2	-	1	1
Weightage of the course	15	10	06	08	-	03	02
Weighted percentage of Course contribution to POs	2.5	2.06	3.19	2.05	0	1.33	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I **(15 hrs)**

Sets and Functions: Functions – Real - Valued Functions – Equivalence Countablility – Real Numbers. **Series of Real Numbers :** Rearrangement of Series – Tests for Absolute Convergence – Series whose terms form a Non Increasing Sequence – Summation by Parts – (C, 1) – Summabiltiy of Series – The class l^2.

UNIT II **(15 hrs)**

Limits and metric Spaces: Limits of a function on the Real Line – Metric Spaces – Limits in Metric Spaces.

UNIT III **(15 hrs)**

Continuous Functions on Metric Spaces: Functions Continuous at a point on the Real Line – Reformulation – Functions Continuous on a Metric Space – Open sets – Closed sets – Discontinuous Functions on R^1.

UNIT IV **(15 hrs)**

Connectedness, completeness and compactness: More about Open Sets – Connected Sets – Bounded Sets and Totally Bounded Sets – Complete Metric Spaces.

UNIT V **(15 hrs)**

Compact Metric Spaces – Continuous Functions on Compact Metric Spaces – Continuity of Inverse Function – Uniform Continuity.

TEXTBOOK

1. Richard R Goldberg. *Methods of Real Analysis*. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd, 2017.

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1. Shanti Narayanan, Rai Singhania, M.D. *Elements of Real Analysis*. New Delhi: S.Chand & Company Ltd., 8th Revised Edition, 2007.
2. Somasundaram, D. Choudhary, B. *A First Course in Mathematical Analysis*.New Delhi : Narosa Publishing House, 2005.
3. Tom.M.Apostol. *Mathematical Analysis*. New Delhi: Narosa Publishing House, Second Edition, 2002.

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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - V
CORE COURSE - XI: OPERATIONS RESEARCH (21UMAC53)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT.MARKS :40**
CREDITS : 4 **EXT.MARKS : 60**
DURATION : 75 hrs **MAX.MARKS: 100**

Preamble

This course introduces the learners to the techniques and methods of solving optimization problems and practical problems involving decision-making.

Course Outcomes (CO)

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

CO1[K2]: explain the solution procedure for solving Linear Programming Problems and the basic concepts related to theory of games and queues

CO2[K3]: solve the linear programming problems using various methods

CO3[K3]: apply the maximin-minimax principle, graphical method and dominance property to find the optimum strategy and value of the game

CO4[K4]: analyse the characteristics of Poisson queueing models

CO5[K5]: evaluate the optimality of solutions of optimization problems

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	1	-	1	-	-	-
CO2[K3]	3	2	2	1	-	1	-
CO3[K3]	3	2	2	1	-	1	-
CO4[K4]	3	3	1	2	-	1	1
CO5[K5]	3	3	1	2	-	1	1
Weightage of the course	15	11	06	07	-	04	02
Weighted percentage of Course contribution to POs	2.5	2.26	3.19	1.79	0	1.78	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I **(15 hrs)**

Linear Programming Problem – Mathematical Formulation: Introduction–Linear Programming Problem – Mathematical Formulation of the Problem – Illustrations on Mathematical Formulation of LPPs. **Linear Programming Problem – Graphical Solution and Extension:** Introduction – Graphical Solution Method – Some Exceptional Cases – General Linear Programming Problem – Canonical and Standard Forms of L.P.P.

UNIT II **(15 hrs)**

Linear Programming Problem-Simplex Method: Introduction – The Computational Procedure – Use of Artificial Variables – Degeneracy in Linear Programming.

UNIT III **(15 hrs)**

Duality in Linear Programming: Introduction – General Primal- Dual Pair – Formulating a Dual Problem – Primal-Dual Pair in Matrix Form – Duality and Simplex Method – Dual Simplex Method.

UNIT IV **(15 hrs)**

Games and Strategies: Introduction– Two Person Zero Sum Games – Some Basic Terms – The Maximin-Minimax Principle – Games Without Saddle Points–Mixed Strategies – Graphic Solution of 2×n and m×2 Games – Dominance Property – Arithmetic Method for n×n Games – General Solution of m × n Rectangular Games.

UNIT V **(15 hrs)**

Queueing Theory: Introduction – Queueing system – Elements of a Queueing system – Operating Characteristics of a Queueing system – Deterministic Queueing system – Probability Distributions in Queueing systems – Classification of Queueing models – Definition of Transient and Steady states – Poisson Queueing systems– Problems in Model I, II, III, IV.

TEXTBOOK

1 . Kanti Swarup, Gupta, P.K. and Man Mohan. *Operations Research.* New Delhi:Sultan Chand and Sons, Sixteenth Edition, 2012.

REFERENCES

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1. Premkumar Gupta, Er. and Kira, D.S. *Problems in Operations Research.* New Delhi: S.Chand and Company Ltd, 2012.
2. Pannerselvam, R. *Operations Research.* New Delhi: Prentice Hall of IndiaPrivate Limited, Second Edition, 2006.
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - V
CORE COURSE - XII: DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS (21UMAC54)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners to various methods of solving differential equations and some applications of differential equations.

Course Outcomes (CO)

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

CO1[K2]: explain the methods of solving ordinary and partial differential equations and the techniques of the Laplace transform

CO2[K3]: solve the ordinary differential equations using various methods

CO3[K3]: apply Laplace transform techniques to solve ordinary differential equations

CO4[K4]: analyze the method of solving simultaneous differential equations

CO5[K5]: evaluate the complete integrals of partial differential equations of the first order

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	-	-
CO2[K3]	3	3	1	1	-	1	1
CO3[K3]	3	3	1	1	-	1	1
CO4[K4]	3	3	1	1	-	1	1
CO5[K5]	3	3	2	1	-	1	1
Weightage of the course	15	14	06	05	-	04	04
Weighted percentage of Course contribution to POs	2.5	2.88	3.19	1.28	0	1.78	2.42

Based on the level of contribution ('3'-High,'2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(15 hrs)**

Equations of the First Order and of the First Degree : Exact Differential

Equations – Sufficient Condition for the Differential Equation to be Exact – Practical Rule for Solving an Exact Differential Equation – Integrating Factors. **Applications of First Order Equations :** Growth, Decay and Chemical Reactions – Flow of Water from an Orifice – Falling Bodies and Other Rate Problems. **Equations of the First Order, but of Higher Degree :** Equations Solvable for dy/dx – Equations Solvable for y – Equations Solvable for x – Clairaut's Form – Equations that do not Contain x Explicitly – Equations that do not Contain y Explicitly – Equations Homogeneous in x and y.

UNIT II **(15 hrs)**

Linear Equation with Constant Coefficients : Definitions – The Operator D – Complementary Function of a Linear Equation with Constant Coefficients – Particular Integral – Linear Equations with Variable Coefficients – Equations Reducible to the Linear Equations – Newton's Law of Gravitation and the Motion of Planets.

UNIT III **(15 hrs)**

Simultaneous Differential Equations : Simultaneous Equations of the First Order and First Degree – Solutions of $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ – Methods for Solving $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ – Geometrical Interpretation of $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ – Simultaneous Linear Differential Equations – Simultaneous Equations with Variable Coefficients. **Linear Equations of the Second Order :** Complete Solution Given a Known Integral – Reduction to the Normal Form – Change of the Independent Variable – Variation of Parameters – Methods of Operational Factors.

UNIT IV **(15 hrs)**

Partial Differential Equations of the First Order : Classification of Integrals – Derivation of Partial Differential Equations – Lagrange's Method of Solving the Linear Equation – Special Methods; Standard Forms – Charpit's Method.

UNIT V **(15 hrs)**

The Laplace Transforms : Definition – Properties of Laplace Transform – Laplace Transform of Periodic Functions – Some General Theorems – Evaluation of Certain Integrals – The Inverse Transform – Properties of Inverse Transform – Method to Solve Ordinary Differential Equations with Constant Coefficients using Laplace Transform – Method to Solve Systems of Differential Equations using Laplace Transform – Method to Solve Differential Equations with Variable Coefficients using Laplace Transform – Method to Solve Equations involving Integrals using Laplace Transform.

TEXTBOOK

1. Narayanan, S. and Manickavachagom Pillay, T.K. *Differential Equations and its Applications.* Chennai : Ananda Book Depot, 2018.

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1. Arumugam, S. and Thangapandi Isaac, A. *Differential Equations and Applications*. Palayamkottai : New Gamma Publishing House, 2014.
2. Vittal, P.R. *Differential Equations, Fourier and Laplace Transforms, Probability*.Chennai : Margham Publications, 2002.
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5. https://nptel.ac.in/courses/111/106/111106100/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - V
MAJOR ELECETIVE COURSE - I: NUMERICAL METHODS (21UMAO51)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS:100**

Preamble

This course introduces the learners to some basic techniques for the efficient numerical solution of problems in science and analyze approximation errors in the process of computation.

Course Outcomes (CO)

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

CO1[K2]: explain the methods of solving the problems in science numerically

CO2[K3]: apply numerical methods to obtain approximate solutions of algebraic, transcendental and differential equations

CO3[K3]: solve simultaneous linear algebraic equations using numerical methods

CO4[K4]: examine the method of interpolation to estimate the unknown data values when they are unequally spaced

CO5[K5]: evaluate the eigen values and eigenvectors of a matrix

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	-	-
CO2[K3]	3	2	1	1	-	1	1
CO3[K3]	3	2	2	1	-	2	1
CO4[K4]	3	3	1	1	-	2	1
CO5[K5]	3	3	1	1	-	2	1
Weightage of the course	15	12	06	05	-	07	04
Weighted percentage of Course contribution to POs	2.5	2.47	3.19	1.28	0	3.11	2.42

Based on the level of contribution ('3'-High, '2'-Medium,'1'-Low, '-' No Correlation)

UNIT I **(12 hrs)**

Algebraic and Transcendental Equations: Introduction – Errors in Numerical Computation – Iteration Method – Bisection Method – Regula Falsi Method – Newton Raphson Method – Horner's Method.

UNIT II **(12 hrs)**

Simultaneous Equations: Introduction – Simultaneous Equations – Back Substitution – Gauss Elimination Method – Gauss Jordan Elimination Method – Calculation of Inverse of a Matrix – Crout's Method.

UNIT III **(12 hrs)**

Iterative Methods – Gauss Jacobi Iteration Method – Gauss Seidel Iteration Method – Relaxation Method.

UNIT IV **(12 hrs)**

Eigen Values and Eigen Vectors of a Matrix: Introduction – Eigen Values – Jacobi's Method. **Interpolation:** Introduction – Lagrange's Interpolation Formula – Divided Differences – Newton's Divided Differences Formula – Hermite's Interpolating Polynomial.

UNIT V **(12 hrs)**

Numerical Solutions of Ordinary Differential Equations: Introduction – Taylor's Series Method – Picard's Method – Euler's Method – Runge-Kutta Methods. **Numerical Solution of Partial Differential Equations:** Introduction – Classification of Partial Differential Equations of Second Order – Finite Difference Approximations to Derivatives – Laplace Equation – Poisson's Equation.

TEXTBOOK

1. Arumugam, S., Thangapandi Isaac, A. and Somasundaram, A. *Numerical Methods*, Chennai : Scitech Publications (India) Pvt Ltd, Second Edition, 2007.

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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - V
MAJOR ELECTIVE COURSE - I: CALCULUS OF FINITE DIFFERENCES
(21UMAO52)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the idea of finite differences and associated concepts which have important applications in numerical analysis.

Course Outcomes (CO)

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

CO1[K2]: explain the concepts of difference operators and their properties

CO2[K3]: solve the linear difference equations and to find numerical solution of ordinary differential equations

CO3[K3]: apply numerical techniques to compute numerical differentiation and integration of given functions

CO4[K4]: analyze the relations connecting the difference operators

CO5[K5]: determine the method of interpolation to estimate the unknown data value between known data values when they are equally spaced

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	-	-
CO2[K3]	3	2	1	1	-	1	1
CO3[K3]	3	2	2	1	-	2	1
CO4[K4]	3	3	1	1	-	2	1
CO5[K5]	3	3	1	1	-	2	1
Weightage of the course	15	12	06	05	-	07	04
Weighted percentage of Course contribution to POs	2.5	2.47	3.19	1.28	0	3.11	2.42

Based on the level of contribution ('3'-High, '2'-Medium,'1'-Low, '-' No Correlation)

UNIT I **(12 hrs)**

Finite Differences : Introduction – Difference Operators – Other Difference Operators – Error Propagation in a Difference Table – Summation of Series.

UNIT II **(12 hrs)**

Interpolation : Newton's Interpolation Formulae – Central Difference Interpolation Formulae – Inverse Interpolation.

UNIT III **(12 hrs)**

Numerical Differentiation and Integration: Introduction – Derivatives using Newton's Forward Difference Formula – Derivatives using Newton's Backward Difference Formula – Derivatives using Central Difference Formulae – Maxima and Minima of the Interpolating Polynomial – Numerical Integration.

UNIT IV **(12 hrs)**

Difference Equations : Introduction – Basic Definition – Formation of Difference Equations – Linear Difference Equations.

UNIT V **(12 hrs)**

Numerical Solution of Ordinary Differential Equations : Predictor Corrector Method – Milne's Method – Adams Basforth Method – Simultaneous First Order Differential Equations – Second Order Differential Equations.

TEXTBOOK

1. Arumugam, S., Thangapandi Isaac, A. and Somasundaram, A. *Numerical Methods*. Chennai : Scitech Publications (India) Pvt Ltd, Second Edition, 2009.

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1. Kalavathy, S. *Numerical Methods*. Chennai : Vijay Nicole Imprints Pvt Ltd, 2004.
2. Kandasamy, P., Thilagavathy, K. and Gunavathi, K. *Numerical Methods*. New Delhi : S.Chand and Company Ltd, 2012.
3. Kandasamy, P. and Thilagavathy, K. *Calculus of Finite Differences and Numerical Analysis.* New Delhi : S.Chand & Company Ltd, First Edition, 2003.

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2. https://theengineeringmaths.com/wp-content/uploads/2017/09/difference-equations.pdf

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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - V
MAJOR ELECTIVE COURSE - I: PROBABILITY THEORY AND THEORY OF ATTRIBUTES (21UMAO53)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the mathematical theory of probability and the methods of association of attributes.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K2]: explain the basic concepts of probability and association of attributes
CO2[K3]: calculate probability of various events using theory of probability
CO3[K3]: calculate coefficient of association between attributes
CO4[K4]: analyze the independence and association of attributes
CO5[K5]: determine the consistency of attributes

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	-	-
CO2[K3]	3	2	1	1	-	1	1
CO3[K3]	3	2	2	1	-	2	1
CO4[K4]	3	3	1	1	-	2	1
CO5[K5]	3	3	1	1	-	2	1
Weightage of the course	15	12	06	05	-	07	04
Weighted percentage of Course contribution to POs	2.5	2.47	3.19	1.28	0	3.11	2.42

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(12 hrs)**

Probability and Expected Value: Introduction – Probability Definition – Calculation of Probability – Addition Theorems of Probability – Bayes' Theorem – Conditional Probability.

UNIT II **(12 hrs)**

Mathematical Expectation – Random Variable and Probability Distribution - Miscellaneous Examples.

UNIT III **(12 hrs)**

Association of Attributes: Introduction – Difference Between Correlation and Association – Notations – Consistency of Data - Association and Disassociation - Methods of Studying Association: Comparison of Observed and Expected Frequencies Methods – Proportion Method – Yule's Coefficient of Association – Coefficient of Colligation.

UNIT IV **(12 hrs)**

Coefficient of Contingency – Miscellaneous examples.

UNIT V **(12 hrs)**

Association of Three Attributes – Partial Association – Illusory Association.

TEXTBOOKS

1. Sharma, A.K. *Text Book of Probability and Theoretical Distribution*. New Delhi:Discovery Publishing House, 2005. **(UNITS I & II)**
2. Sharma, A.K. *Text Book of Sampling and Attributes*. New Delhi: DiscoveryPublishing House, 2005. **(UNITS III, IV & V)**

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1. Arumugam, S. and Thangapandi Isaac, A. *Statistics*. Palayamkottai: New Gamma Publishing House, 2009.
2. Gupta, S.C. and Kapoor, V.K. *Elements of Mathematical Statistics*. New Delhi: Sultan Chand and Sons, 2006.
3. Kapur, J.N. and Saxena H.G. *Mathematical Statistics*. New Delhi: S.Chand & Company LTD, 1989.

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3. https://youtu.be/VVYLpmKRfQ8
4. https://youtu.be/UftY0e2ilM4
5. https://youtu.be/GSEu5hn2q98

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - V
MAJOR ELECTIVE COURSE - II: DISCRETE MATHEMATICS (21UMAO54)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to some mathematical tools for solving problems arising from Computer Science.

Course Outcomes (CO)

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

CO1[K2]: explain the basic concepts related to functions, semigroups, monoids, recurrence relation and logic

CO2[K3]: compute the inverse of functions and the composition of two or more functions

CO3[K3]: solve the recurrence relations using the generating function

CO4[K4]: analyze the axioms and properties of the algebraic structures semigroup and monoids

CO5[K5]: assess the truth values of statements with reference to propositional logic

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	-	-
CO2[K3]	3	2	2	1	-	1	-
CO3[K3]	3	2	2	1	-	1	-
CO4[K4]	3	2	2	1	-	1	1
CO5[K5]	3	2	2	1	-	1	1
Weightage of the course	15	10	09	05	-	04	02
Weighted percentage of Course contribution to POs	2.5	2.06	4.79	1.28	0	1.78	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I **(12 hrs)**

Functions: Function and Operators – One-to-one, Onto Functions – Special Types of Functions – Invertible Functions – Composition of Functions.

UNIT II **(12 hrs)**

Recurrence Relations and Generating Functions: Recurrence-An Introduction – Polynomials and their Evaluations – Recurrence Relations – Solution of Finite Order Homogeneous (linear) Relations – Solution of Non-homogeneous Relations – Generating Functions – Some Common Recurrence Relations – Primitive Recursive Functions – Recursive and Partial Recursive Functions.

UNIT III **(12 hrs)**

Algebraic Systems: Binary Operation – Algebraic Systems – Semigroups and Monoids – Homomorphism and Isomorphism of Semigroups and Monoids – Properties of Homomorphism – Subsemigroups and Submonoids.

UNIT IV **(12 hrs)**

Logic: Introduction – TF Statements – Connectives – Atomic and Compound Statements – Well-Formed (Statement) Formulae – The Truth Table of a Formula – Tautology – Tautological Implications and Equivalence of Formulae.

UNIT V **(12 hrs)**

Replacement Process – Functionally Complete Sets of Connectives and Duality Law – Normal Forms – Principal Normal Forms – Theory of Inference.

TEXTBOOK

1. Venkataraman, M.K., Sridharan, N. and Chandrasekaran, N. *Discrete Mathematics.* Chennai: The National Publishing Company, 2011.

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Books

1. Trembley, J.P. and Manohar, R. *Discrete Mathematical Structures with Applications to Computer Science*. New Delhi: Tata McGraw Hill Publishing Company Limited, 2008.
2. Ralph P.Grimaldi. *Discrete and Combinational Mathematics An Applied Introduction*. New Delhi: Pearson Education Pte. Ltd., Fourth Edition, 1999.
3. Sharma, J.K. *Discrete Mathematics.* New Delhi: Macmillan India Ltd, Second Edition, 2005.

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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - V
MAJOR ELECTIVE COURSE - II: INTEGRAL TRANSFORMS (21UMAO55)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to some important integral transforms that can be used to solve boundary value and initial value problems in mathematical science.

Course Outcomes (CO)

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

CO1[K2]: explain the general form and properties of various integral transforms

CO2[K3]: find the Fourier, Hilbert and Z-Transform of given functions

CO3[K3]: solve the boundary value and initial value problems using the integral transforms

CO4[K4]: analyze the properties of integral transforms

CO5[K5]: determine the appropriate integral transform that simplifies the computational techniques considerably

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	-	-
CO2[K3]	3	2	2	1	-	1	-
CO3[K3]	3	2	2	1	-	1	-
CO4[K4]	3	2	2	1	-	1	1
CO5[K5]	3	2	2	1	-	1	1
Weightage of the course	15	10	09	05	-	04	02
Weighted percentage of Course contribution to POs	2.5	2.06	4.79	1.28	0	1.78	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I **(12 hrs)**

Fourier Transform: Introduction – Classes of Functions – Fourier Series and Fourier Integral Formula – Fourier Transforms – Linearity Property of Fourier Transforms – Change of Scale Property – The Modulation Theorem – Evaluation of Integrals by Means of Inversion Theorems – Fourier Transform of Some Particular Functions – Convolution or Faltung of Two Integrable Functions – Convolution or Falting or Faltung Theorem for FT – Parseval's Relations for Fourier Transforms – Fourier Transform of the Derivative of a Function – Fourier Transform of Some More Useful Functions.

UNIT II **(12 hrs)**

Fourier Transforms of Rational Functions – Other Important Examples Concerning Derivative of FT – The Solution of Integral Equations of Convolution Type – Fourier Transform of Functions of Several Variables – Application of Fourier Transform to Boundary Value Problems.

UNIT III **(12 hrs)**

Hilbert and Stieltjes Transforms: Introduction – Definition of Hilbert Transform – Some Important Properties of Hilbert Transforms – Relation between Hilbert Transform and Fourier Transform – Finite Hilbert Transform – One-sided Hilbert Transform – Asymptotic Expansions of One-sided Hilbert Transform – The Stieltjes Transform – Some Deductions – The Inverse Stieltjes Transform – Relation between Hilbert Transform and Stieltjes Transform.

UNIT IV **(12 hrs)**

Hankel Transforms: Introduction – The Hankel Transform – Elementary Properties – Inversion Formula for Hankel Transform – The Parseval Relation for Hankel Transforms – Illustrative Examples.

UNIT V **(12 hrs)**

The Z-Transform: Introduction – Z-Transform: Definition – Some Operational Properties of Z-Transform – Application of Z-Transforms.

TEXTBOOK

1. Baidyanath Patra. *An Introduction to Integral Transforms*. Newyork: CRC Press Taylor & Francis Group, Broken Sound Parkway NW, 2018.

REFERENCES

Books

1. Lokenath Debnath and Dambaru Bhatta. *Integral Transforms and Their Applications*. Newyork: Chapman & Hall/CRC Taylor & Francis Group, Broken Sound Parkway NW, Second Edition, 2007.
2. Balaji, G. *Transforms and Partial Differential Equations*. Chennai:G.Balaji Publishers, Thirteenth Edition, 2017.

3. Ronald N.Bracewell. *The Fourier Transform and Its Applications*. Mc Graw-Hill Higher Education, Third Edition, 2000.

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2. https://www.math.tamu.edu/~alexeip/PSZ.pdf
3. https://www.et.byu.edu/~vps/ME505/IEM/09%2004.pdf
4. https://nptel.ac.in/courses/111/102/111102129/
5. https://www.pdfdrive.com/an-introduction-to-integral-transforms-d187713205.html
6. https://www.zuj.edu.jo/download/the-fourier-transform-and-its-applications-bracewell-pdf/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - V
MAJOR ELECTIVE COURSE - II: CODING THEORY (21UMAO56)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT.MARKS : 40**
CREDITS : 3 **EXT.MARKS : 60**
DURATION : 60 hrs **MAX. MARKS:100**

Preamble

This course introduces the learners to the concepts of source coding and various coding techniques that can be used to transmit information more reliably.

Course Outcomes (CO)

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

CO1[K2]: explain the fundamental concepts of coding theory, types of error and control code techniques

CO2[K3]: apply the concepts of perfect codes, hamming codes, extended codes and golay codes for error detection and correction

CO3[K3]: compute a generator matrix, a parity check matrix and generator polynomial for various codes

CO4[K4]: analyze the theoretical principles of source coding and the notion of various decoding techniques

CO5[K5]: determine the basis for the linear code

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	-	-
CO2[K3]	3	2	2	1	-	1	-
CO3[K3]	3	2	2	1	-	1	-
CO4[K4]	3	2	2	1	-	1	1
CO5[K5]	3	2	2	1	-	1	1
Weightage of the course	15	10	09	05	-	04	02
Weighted percentage of Course contribution to POs	2.5	2.06	4.79	1.28	0	1.78	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Introduction to Coding Theory: Basic assumptions – Correcting and detecting error patterns – Information rate – Effects of error correction and detection – Finding the most likely code word transmitted.

UNIT II **(12 hrs)**

Linear Codes: Linear codes – Two important subspaces – Independence, Basis, Dimension – Matrices – Bases for $C = < S >$ and $C^{\perp}$ – Generating matrices and Encoding.

UNIT III **(12 hrs)**

Parity-check matrices – Equivalent codes – Distance of a linear code – Cosets – MLDfor linear codes – Reliability of IMLD for linear codes.

UNIT IV **(12 hrs)**

Perfect and Related Codes: Some bounds for codes – Perfect codes – Hamming codes – Extended codes – The Extended Golay code – Decoding the extended Golay code – The Golay code.

UNIT V **(12 hrs)**

Cyclic Linear Codes: Polynomials and Words – Introduction to cyclic codes – Polynomial Encoding and Decoding – Finding cyclic codes – Dual cyclic codes.

TEXTBOOK

1. Hoffman, D.G., Leonard, D.A., Linder, C.C., Phelps, K.T., Rodger, C.A. and Wall, J.R. *Coding Theory - The Essentials.* New York: Marcel Dekker, Inc., 1991.

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1. Ron M. Roth. *Introduction to Coding Theory.* Cambridge, UK: Cambridge University Press, 2006.
2. Ranganathan, H. *Information Coding Techniques.* Chennai: Charulatha Publications, First Edition, 2004.
3. Garrett Birkhoff & Thomas C.Bartee. *Modern Applied Algebra*. New Delhi: CBS Publishers & Distributors, 1999.

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2. https://www.win.tue.nl/~henkvt/images/CODING.pdf
3. https://www.youtube.com/watch?v=J7uBimjj4Jo
4. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.125.100&rep=rep1&type=pdf

5. https://books.google.co.ck/books?id=UTxjBX9lKoMC&printsec=frontcover#v=onepage&q&f=false

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF INFORMATION TECHNOLOGY
UG Programme – B.Sc. Mathematics
SEMESTER - V
SKILL ENHANCEMENT COURSE – V: PRACTICAL - HTML (21UMAS5P)
(For those who have joined from June 2021 and later)

HOURS/WEEK: 2 **INT. MARKS : 50**
CREDITS : 2 **EXT. MARKS : 50**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course aims to introduce the students to basic tags involved in web page designing and to explore their creative designing skills.

Course Outcomes (CO)

On Successful completion of the course, the learners will be able to
CO1[K1]: state the basic web programming concepts
CO2[K2]: illustrate the various types of lists
CO3[K3]: apply the mapping concepts with the help of image map
CO4[K4]: classify the form tags involved in designing a web page
C05[K6]: create and develop own web site using frames and images

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	-	2	-	1	-
CO2[K2]	2	2	-	2	-	1	-
CO3[K3]	2	2	-	1	1	1	1
CO4[K4]	2	2	-	2	1	1	1
CO5[K6]	1	1	-	1	2	1	1
Weightage of the course	09	09	-	08	04	05	03
Weighted percentage of Course contribution to POs	1.5	1.85	0	2.05	4.17	2.22	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

1. To design the simple web page using HTML tags.
2. To create the Time table using Table tags.
3. To design the web page for displaying student bio data.
4. To design the web page for Menu card using Lists

5. To design the web page for map using Image map tag.
6. To prepare the Advertisement using Marquee Tags
7. To create the simple image gallery using frames tag.
8. To create the any application form using forms tag.
9. To create the college website using HTML tags.
10. To create the tourism website using frames tags.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - VI
CORE COURSE - XIII: LINEAR ALGEBRA (21UMAC61)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 40**
CREDITS : 5 **EXT. MARKS : 60**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the abstract concepts of the algebraic system vector space and the general theory of matrices.

Course Outcomes (CO)

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

CO1[K2]: explain the basic concepts and general theory of vector spaces, inner product spaces and matrices

CO2[K3]: apply the abstract concepts to produce proofs of results that arise in the context of linear algebra

CO3[K3]: compute the inverse of a matrix using Cayley – Hamilton theorem and find eigen values and eigen vectors of a matrix

CO4[K4]: analyze the properties of vectors in an inner product space

CO5[K5]: determine the basis of a vector space

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	-	1	-	-	-
CO2[K3]	3	2	1	1	-	-	-
CO3[K3]	3	2	1	2	-	2	1
CO4[K4]	3	3	2	2	-	2	1
CO5[K5]	3	3	2	2	-	2	1
Weightage of the course	15	12	06	08	-	06	03
Weighted percentage of Course contribution to POs	2.5	2.47	3.19	2.05	0	2.67	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(15 hrs)**

Vector Spaces: Introduction – Definition and Examples – Subspaces –

Linear Transformation.

UNIT II **(15 hrs)**

Span of a Set – Linear Independence – Basis and Dimension – Rank and Nullity – Matrix of a Linear Transformation.

UNIT III **(15 hrs)**

Inner Product Spaces: Introduction – Definition and Examples – Orthogonality – Orthogonal Complement.

UNIT IV **(15 hrs)**

Theory of Matrices: Introduction - Algebra of Matrices – Types of Matrices – The Inverse of a Matrix – Elementary Transformations – Rank of a Matrix – Simultaneous Linear Equations – Characteristic Equations and Cayley Hamilton Theorem.

UNIT V **(15 hrs)**

Eigen Values and Eigen Vectors. **Bilinear Forms:** Introduction – Bilinear Forms – Quadratic Forms.

TEXTBOOK

1. Arumugam, S. and Thangapandi Issac, A. *Modern Algebra*. Chennai: Scitech Publications (India) Pvt Ltd, 2008.

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1. Bhattacharya, P.B., Jain, S.K., and Nagpaul, S.R. *First Course in Linear Algebra*. NewDelhi: New Age International (P) Ltd, Publishers, 2001.
2. Kumaresan, S. *Linear Algebra: A Geometric Approach*. NewDelhi: PHI Learning Private Limited, 2017.
3. Sharma, S.D. *Modern Algebra*. Meerut: Kedar Nath Ram Nath & Co. Publishers,1997.

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3. https://ocw.mit.edu/ans7870/18/18.013a/textbook/HTML/chapter04/section06.html
4. https://www.youtube.com/watch?v=ffXZBZB0hOY
5. https://byjus.com/maths/eigen-values/#:~:text=Eigenvectors%20are%20the%20vectors%20(non,any%20linear%20transformation%20is%20applied.&text=In%20a%20brief%2C%20we%20can,a%20scalar%20multiple%20of%20x.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - VI
CORE COURSE - XIV: COMPLEX ANALYSIS (21UMAC62)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT.MARKS : 40**
CREDITS : 5 **EXT.MARKS : 60**
DURATION : 75 hrs **MAX.MARKS:100**

Preamble

This course familiarizes the learners with the fundamental concepts and theory for functions of a complex variable.

Course Outcomes (CO)

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

CO1[K2]: explain the basic concepts and properties of functions of a complex variable

CO2[K3]: apply the abstract concepts to produce proofs of results that arise in the context of complex analysis

CO3[K3]: compute the value of the integral, residues and poles for complex valued functions

CO4[K4]: analyse the properties of bilinear transformations and series expansion of analytic functions in the region of convergence

CO5[K5]: determine the continuity, differentiability, analyticity of complex functions

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	-	-
CO2[K3]	3	2	1	2	-	-	-
CO3[K3]	3	2	1	2	-	1	1
CO4[K4]	3	2	1	2	-	1	1
CO5[K5]	3	2	2	2	-	1	1
Weightage of the course	15	10	06	09	-	03	03
Weighted percentage of Course contribution to POs	2.5	2.06	3.19	2.31	0	1.33	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(15 hrs)**

Analytic Functions: Functions of a Complex Variable – Limits– Theorems on Limit – Continuous Functions–Differentiability – The Cauchy – Riemann Equations – Analytic Functions – Harmonic Functions – Conformal Mapping.

UNIT II **(15 hrs)**

Bilinear Transformations: Elementary Transformations – Bilinear Transformations – Cross Ratio – Fixed Points of Bilinear Transformations – Some Special Bilinear Transformations. **Mapping by Elementary Functions:** The Mapping $w=z^2$, $w=z^n$, $w=e^z$, $w=\sin z$, $w=\cos z$.

UNIT III **(15 hrs)**

Complex Integration: Definite Integral – Cauchy's Theorem – Cauchy's Integral Formula – Higher Derivatives.

UNIT IV **(15 hrs)**

Series Expansions: Taylor's Series – Laurent's Series – Zeros of an Analytic Function – Singularities.

UNIT V **(15 hrs)**

Calculus of Residues: Residues – Cauchy's Residue Theorem – Evaluation of Definite Integrals.

TEXTBOOK

1. Arumugam, S., Thangapandi Isaac, A. and Somasundaram, A. *Complex Analysis.* Chennai: Scitech Publications (India) Pvt Ltd, 2011.

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1. Narayanan, S. and ManicavachagomPillay, T.K. *Complex Analysis.* Viswanthan, S. (Printers and Publishers) Pvt. Ltd, Fifth Edition.
2. Duraipandian, P. and KayalalPachaiyappa. *Complex Analysis.* New Delhi: S.Chand and Company Pvt. Ltd, 2014.
3. Shanti Narayan and Vittal, P.K.Theory of Functions of a Complex Variable. New Delhi: S.Chand & Company Ltd, Eighth Edition, 2005.

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1. https://www.mathcity.org/ media/msc/notes/complex-analysis-m-usman-hamid.pdf
2. https://www.mathcity.org/ media/msc/notes/complex-analysis-quick-review-akhtar-abbas.pdf
3. https://www.math.columbia.edu/~rf/complex2.pdf
4. https://www.researchgate.net/publication/280722238 Complex Analysis Problems with solutions

5. https://www.youtube.com/watch?v=uliv9TzeD6o

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - VI
CORE COURSE - XV: GRAPH THEORY (21UMAC63)
(From 2021-2022 Batch onwards)

HOURS/ WEEK: 5 **INT. MARKS : 40**
CREDITS : 5 **EXT. MARKS : 60**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the graph theoretical concepts that help to model real life problems.

Course Outcomes (CO)

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

CO1[K2]: explain the basic concepts of graph theory

CO2[K3]: apply the abstract concepts to produce proofs of results that arise in the context of graph theory

CO3[K3]: provide matrix representations, the chromatic index, chromatic polynomial of a graph and demonstrate various operations on graphs

CO4[K4]: examine the characterizations of various graphs

CO5[K5]: evaluate the realisation graph of a degree sequence and determine the Eulerian / Hamiltonian graphs

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	-	-
CO2[K3]	3	2	1	1	-	-	-
CO3[K3]	3	3	1	2	-	1	1
CO4[K4]	3	3	2	2	1	1	1
CO5[K5]	3	3	1	2	1	1	1
Weightage of the course	15	13	06	08	02	03	03
Weighted percentage of Course contribution to POs	2.5	2.67	3.19	2.05	2.08	1.33	1.82

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(15 hrs)**

Graphs and Subgraphs: Introduction – Definition and Examples –

Degrees – Sub graphs – Isomorphism – Ramsey Numbers – Independent Sets and Coverings – Intersection Graphs and Line Graphs – Matrices – Operations on Graphs.

UNIT II **(15 hrs)**

Degree Sequences: Introduction – Degree Sequences – Graphic Sequences. **Connectedness:** Introduction – Walks, Trails and Paths – Connectedness and Components – Blocks – Connectivity.

UNIT III **(15 hrs)**

Eulerian and Hamiltonian Graphs: Introduction – Eulerian Graphs – Hamiltonian Graphs. **Trees**: Introduction – Characterisation of Trees – Centre of a Tree.

UNIT IV **(15 hrs)**

Matchings: Introduction – Matchings – Matchings in Bipartite Graphs. **Planarity:** Introduction – Definition and Properties – Characterization of Planar Graphs – Thickness, Crossing and Outer Planarity.

UNIT V **(15 hrs)**

Colourability: Introduction – Chromatic Number and Chromatic Index – The Five Colour Theorem – Four Colour Problem – Chromatic Polynomials.

TEXTBOOK

1. Arumugam, S. and Ramachandran, S. *Invitation to Graph Theory*. Chennai: Scitech Publications (India) Pvt. Ltd, 2009.

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1. Harary. *Graph Theory*. New Delhi: Narosa Publishing House, 2001.
2. Murugan, M. *Topics in Graph Theory and Algorithms*. Chennai: Muthali Publishing House, 2003.
3. Choudum, S. A. *A First Course in Graph Theory*. New Delhi: Macmillan India Limited, 1999.

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2. https://proofwiki.org/wiki/Dirac%27s_Theorem
3. https://proofwiki.org/wiki/Graph_is_Bipartite_iff_No_Odd_Cycles
4. https://www.youtube.com/watch?v=yklF3JDMxGk
5. https://www.youtube.com/watch?v=AtDgXyluW-Y

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - VI
CORE COURSE - XVI: VECTOR CALCULUS (21UMAC64)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to various differential operators defined on scalar or vector fields and its properties, some classical theory of space curves and surfaces using vector methods.

Course Outcomes (CO)

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

CO1[K2]: explain the basic concepts of vector differentiation and vector integration

CO2[K3]: compute the curl, divergence and line integral of vector valued functions

CO3[K3]: calculate the curvature and torsion of the given curve

CO4[K4]: analyze the properties of curl and divergence

CO5[K5]: evaluate Green's, Gauss's Divergence and Stoke's theorem for the vector valued functions

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	1	-	1	-	-	-
CO2[K3]	3	3	1	2	-	-	-
CO3[K3]	3	3	1	2	-	-	-
CO4[K4]	3	3	2	2	-	1	1
CO5[K5]	3	3	2	2	-	1	1
Weightage of the course	15	13	06	09	-	02	02
Weighted percentage of Course contribution to POs	2.5	2.67	3.19	2.31	0	0.89	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(15 hrs)**

Gradient, Divergence and Curl: Differentiation of Vectors – A Few Results on Differentiation of Vectors – Meaning of the Derivative of Position Vector – Physical Applications – Level Surfaces – The Vector Differential Operator – Gradient – Direction and Magnitude of Gradient.

UNIT II **(15 hrs)**

Divergence and Curl –Solenoidal – Irrotational – Formulae Involving Operator □ – Operators Involving □ Twice.

UNIT III **(15 hrs)**

Differential Geometry: Space Curve – Tangent at a Given Point – **Curvature:** Principal Normal –Binormal: Torsion Frenet's Formulae.

UNIT IV **(15 hrs)**

Vector Integration: Introduction – Line Integral – Volume Integral – Surface Integral.

UNIT V **(15 hrs)**

Gauss Divergence Theorem – Green's Theorem (in Space) – Green's Theorem – Stokes' Theorem – Green's Theorem (in Plane).

TEXTBOOK

1. Narayanan, S. and Manicavachagom Pillay, T.K. *Vector Calculus.* Chennai: S.Viswanathan (Printers & Publishers), Pvt, Ltd, 1997.

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1. Raisinghania, M.D., Saxena, H.C. and Dass, H.K. *Simplified Course in VectorAlgebra.* New Delhi: S. Chand & Company Ltd., 1999.
2. Shanti Narayan and Kapur, T.N. *A Text Book of Vector Calculus (with Applications)*. New Delhi: S. Chand & Company Ltd., 2000.
3. Arumugam, S. and Thangapandi Issac, A. *Analytical Geometry 3D, Vector Calculus & Trigonometry*. Palayamkottai: New Gamma Publishing House, 2006.

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2. https://mathinsight.org/stokes_theorem_examples
3. https://www.whitman.edu/mathematics/calculus_online/section16.03.html
4. https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.d.umn.edu/~vvanchur/2014PHYS4011/Chapter1.pdf&ved=2ahUKEwio5JvV8K_vAhU44zgGHZBGDdAQFjAQegQIEhAC&usg=AOvVaw2UAoQNpV1Tf88QxWY5Ylli&cshid=1615728348155
5. https://nptel.ac.in/courses/111/105/111105122/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - VI
CORE COURSE - XVII: PROJECT (21UMAJ61)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS: 50**
CREDITS : 3 **EXT. MARKS: 50**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners with the objectives and stages in formulating a Research Project and the methodologies of analyzing the data hypothesis, reporting findings and structuring manuscript.

Course Outcomes (CO)

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

CO1 [K2]: express their views with apt illustrations and critical support
CO2 [K3]: organize the views and format them into a research paper
CO3 [K4]: analyze the views which take about various approaches to the definition terms
CO4 [K5]: evaluate the findings of the study
CO5 [K6]: compile the Documentation as per the latest Research Methodology

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	2	2	2	2	-	1	1
CO2[K3]	2	2	2	2	2	1	1
CO3[K4]	2	2	2	1	-	1	1
CO4[K5]	2	2	2	1	2	1	1
CO5[K6]	2	2	2	1	-	1	1
Weightage of the course	10	10	10	07	04	05	05
Weighted percentage of Course contribution to POs	1.67	2.06	5.32	1.79	4.17	2.22	3.03

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

Guidelines

1. Students will work individually or in groups with maximum 5 members on a semester-long project.
2. Depending on the interest of the students, project research areas will be chosen.
3. Students must meet the guide periodically.
4. The project carries 100 marks of which 50 marks for Internal Assessment and 50 Marks for External Examination.
5. There will be two project review sessions.
6. A draft of the final project report should be submitted to the Project Guide for review atleast two weeks prior to the end of the semester.
7. The project report should be of minimum 25 pages (excluding bibliography & appendices).
8. Two copies of the final project report should be submitted.
9. The Head of the department and the Project Guide will evaluate the final Project Report.
10. The viva-voce board shall consist of the External Examiner, the Head of the Department and the Internal Examiner.

The following rubrics will be taken into account for the evaluation of Project work and viva-voce:

Internal Assessment (50 Marks)		**External Examination (50 Marks)**	
Project Report & Review	: 40 Marks	Project Report	: 20 Marks
Powerpoint Presentation	: 5 Marks	Viva Voce	: 30 Marks
Demo/Performance	: 5 Marks		

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - VI
MAJOR ELECTIVE COURSE - III: RESOURCE MANAGEMENT TECHNIQUES
(21UMAO61)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT.MARKS : 40**
CREDITS : 3 **EXT.MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the techniques and methods of managing various resources of a business effectively.

Course Outcomes (CO)

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

CO1[K2]: explain the basic concepts and solution procedure related to Transportation problem, Assignment problem, Sequencing problem and Inventory control problem

CO2[K3]: solve the Transportation problem, Assignment problem and Sequencing problem for optimum solution

CO3[K3]: compute the optimum value of the various costs and factors that are involved in inventory control

CO4[K4]: analyze the different models of sequencing and inventory control problems

CO5[K5]:evaluate the optimality of solutions of transportation and assignment problems

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	1	1	1	-	-	-
CO2[K3]	3	2	1	1	-	1	-
CO3[K3]	3	2	1	1	-	1	-
CO4[K4]	3	3	1	2	1	1	1
CO5[K5]	3	3	1	2	1	1	1
Weightage of the course	15	11	05	07	02	04	02
Weighted percentage of Course contribution to POs	2.5	2.26	2.66	1.79	2.08	1.78	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Transportation Problem: Introduction – LP Formulation of the Transportation Problem – Existence of Solution in T.P. – Duality in Transportation Problem -Transportation Table – Loops in Transportation Tables –Triangular Basis in a T.P. – Solution of a Transportation Problem – Finding an Initial Basic Feasible Solution.

UNIT II **(12 hrs)**

Test for Optimality –Economic Interpretation of $u_i's$ and $v_j's$– Degeneracy in Transportation Problem – Transportation Algorithm (MODI Method) – Stepping Stone Solution Method – Some Exceptional Cases – Time-Minimization Transportation Problem – TranshipmentProblems.

UNIT III **(12 hrs)**

Assignment Problem: Introduction – Mathematical Formulation of the Problem – Solution Methods of Assignment Problem – Special Cases in Assignment Problems – A Typical Assignment Problem – Dual of the Assignment Problem – The Travelling Salesman Problem.

UNIT IV **(12 hrs)**

Sequencing Problem: Introduction – Problem of Sequencing – Basic Terms Used in Sequencing – Processing n Jobs Through Two Machines – Processing n Jobs Through k Machines – Processing 2 Jobs Through k Machines – Maintenance Crew Scheduling.

UNIT V **(12 hrs)**

Inventory Control – I: Introduction– Types of Inventories – Reasons for Carrying Inventories -The Inventory Decisions – Objectives of Scientific Inventory Control - Costs Associated with Inventories – Factors Affecting Inventory Control – An Inventory Control Problem –The Concept of EOQ – Deterministic Inventory Problems with no Shortages - Deterministic Inventory Problems with Shortages.

TEXTBOOK

1. Kanti Swarup, Gupta, P.K. and Man Mohan. *Operations Research.* New Delhi: Sultan Chand and Sons, Sixteenth Edition, 2012.

REFERENCES

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1. Premkumar Gupta, Er. and Kira, D.S. *Problems in Operations Research.* New Delhi: S.Chand and Company Ltd, 2012.
2. Pannerselvam, R. *Operations Research.* New Delhi: Prentice Hall of India

Private Limited, Second Edition, 2006.
3. Kapoor, V.K. *Operations Research*. New Delhi: Sultan Chand & SonsEducational Publishers, 2000.

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3. https://thalis.math.upatras.gr/~tsantas/DownLoadFiles/Taha%20%20Operation%20Research%208Ed.pdf
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - VI
MAJOR ELECTIVE COURSE - III: PROJECT NETWORK TECHNIQUES
(21UMAO62)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT.MARKS : 40**
CREDITS : 3 **EXT.MARKS : 60**
DURATION : 60 hrs **MAX.MARKS: 100**

Preamble

This course introduces the learners to the network techniques and network methods for planning, scheduling and controlling a project.

Course Outcomes (CO)

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

CO1[K2]: explain the network techniques, network methods of project management and the various element of a network

CO2[K3]: compute event times, activity times and floats for each activity of the network

CO3[K3]: apply the network rules to draw the network diagram of a project whose activities inter-relationships are stated

CO4[K4]: analyse the kinds of time estimates in PERT system

CO5[K5]: determine the critical path of the given network

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	1	1	1	-	-	-
CO2[K3]	3	2	1	1	-	1	-
CO3[K3]	3	2	1	1	-	1	-
CO4[K4]	3	3	1	2	1	1	1
CO5[K5]	3	3	1	2	1	1	1
Weightage of the course	15	11	05	07	02	04	02
Weighted percentage of Course contribution to POs	2.5	2.26	2.66	1.79	2.08	1.78	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Project Management: Introduction – Project Planning – Scheduling – Controlling – Role of decision in project management – Techniques for Analysing Alternatives: Operation research. **Bar Charts and Milestone Charts:** Introduction – Development of Bar Chart – Illustrative Examples – Shortcoming of Bar Charts and Remedial Measures – Milestone Charts – Development of PERT network.

UNIT II **(12 hrs)**

Elements of Network: Introduction – Event – Activity – Dummy – Network Rules – Graphical Guidelines for Network – Common Partial Situation in Network – Numbering the Events – Cycles.

UNIT III **(12 hrs)**

PERT-Time Estimates: Introduction – Uncertainties: Use of PERT – Time estimates – Expected Time.**PERT-Time Computations:** Introduction – Earliest Expected Time – Formulation for T_E – Latest Allowable Occurrence Time – Formulation for T_L– Combined Tabular Computations for T_E and T_L.

UNIT IV **(12 hrs)**

PERT-Network Analysis: Slack – Critical Path – Illustrative Examples – Probabilities of Meeting Scheduled date.

UNIT V **(12 hrs)**

CPM-Network Analysis: Introduction – CPM: Process – CPM: Networks – Activity Time Estimate – Earliest Event Time – Latest Allowable Occurrence Time – Combined Tabular Computations for T_E and T_L – Starts and Finish times of activity – Float – Critical Activities and Critical Path.

TEXTBOOK

1. Punmia, B.C. and Khandelwel, K.K. *Project Planning and Control with PERT and CPM*. NewDelhi: Laxmi Publication (P) Ltd,Fourth Edition Reprint 2006.

REFERENCES

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1. Srinath, L. S. *PERT and CPM Principles and Applications,* New Delhi: Affiliated east-west press pvt. Ltd, Reprint 2000.
2. Baker, Bruce and Eris, and Rene, L. *An introduction to PERT-CPM*, Homewood III: R. D. Irwin, 1964.
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - VI
MAJOR ELECTIVE COURSE - III: MATHEMATICAL PROGRAMMING TECHNIQUES (21UMAO63)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT.MARKS : 40**
CREDITS : 3 **EXT.MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the problem types and solution tools of mathematical programming problems.

Course Outcomes (CO)

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

CO1[K2]: explain the techniques and the computational procedure for solving mathematical programming problems

CO2[K3]: solve integer programming problems and non-linear programming problems by various methods

CO3[K3]: apply dynamic programming and geometric programming approach to find solution of practical problems

CO4[K4]: analyse the different methods of dynamic programming and geometric programming approach

CO5[K5]: evaluate the optimality of solutions of integer programming problems and non-linear programming problems

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	1	1	1	-	-	-
CO2[K3]	3	2	1	1	-	1	-
CO3[K3]	3	2	1	1	-	1	-
CO4[K4]	3	3	1	2	1	1	1
CO5[K5]	3	3	1	2	1	1	1
Weightage of the course	15	11	05	07	02	04	02

Weighted percentage of Course contribution to POs	2.5	2.26	2.66	1.79	2.08	1.78	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(12 hrs)**

Integer Programming: Introduction – Pure and Mixed Integer Programming Problems – Gomory's All - I.P.P Method – Construction of Gomory's Constraints – Fractional Cut Method-All integer LPP – Fractional Cut Method-Mixed Integer LPP – Branch and Bound Method – Applications of Integer Programming.

UNIT II **(12 hrs)**

Dynamic Programming: Introduction – The Recursive Equation Approach – Characteristics of Dynamic Programming – Dynamic Programming Algorithm – Solution of Discrete D.P.P – Some Applications – Solution of L.P.P. by Dynamic Programming.

UNIT III **(12 hrs)**

Non-Linear Programing: Introduction – Formulating a Non-Linear Programming Problem (NLPP) – General Non-Linear Programming Problem – Constrained Optimization with Equality Constraints – Constrained Optimization with Inequality Constraints – Saddle Point Problems – Saddle Points and NLPP.

UNIT IV **(12 hrs)**

Non-Linear Programming – Methods: Introduction – Graphical Solution – Kuhn-Tucker Conditions with Non-Negative Constraints – Quadratic Programming – Wolfe' Modified Simplex Method – Beale's Method – Separable Convex Programming – Separable Programming Algorithm.

UNIT V **(12 hrs)**

Geometric Programming: Introduction – Geometric-Arithmetic Mean Inequality – Unconstrained Geometric Programming Problem – Constrained Geometric Programming Problem – Complementary Geometric Programming – Complementary G.P. Algorithm.

TEXTBOOK

1. Kanti Swarup, Gupta, P.K. and Man Mohan. *Operations Research.* New Delhi:Sultan Chand and Sons, Sixteenth Edition, 2012.

REFERENCES

Books

1. Premkumar Gupta, Er. and Kira, D.S. *Problems in Operations Research.* New Delhi: S.Chand and Company Ltd, 2012.
2. Pannerselvam, R. *Operations Research.* New Delhi: Prentice Hall of IndiaPrivate Limited, Second Edition, 2006.
3. Kapoor, V.K. *Operations Research*. New Delhi: Sultan Chand & SonsEducational Publishers, 2000.

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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - VI
SKILL ENHANCEMENT COURSE - VI: PRACTICAL - COMPUTATIONAL METHODS IN OCTAVE (21UMAS6P)
(From 2021-2022 Batch onwards)

HOURS/WEEK : 2 **INT. MARKS : 50**
CREDITS : 2 **EXT. MARKS : 50**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course equips the learners with the techniques and tools for solving numerical problems using the Octave language.

Course Outcomes (CO)

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

CO1[K2]: explain the script, syntax, commands, functions in Octave programming

CO2[K3]: apply the built – in math functions and extensive function libraries to write syntax of octave programming

CO3[K3]: solve linear and nonlinear problems numerically using octave programming

CO4[K4]: analyze the matrix – based syntax and functions for matrix operations in Octave programming

CO5[K5]: assess the compatibility of syntax and functions in Octave programming

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	2	1	-	2	-	-	-
CO2[K3]	2	1	1	2	-	-	-
CO3[K3]	3	2	1	2	-	2	-
CO4[K4]	3	2	1	2	-	2	1
CO5[K5]	2	1	1	2	-	2	1
Weightage of the course	12	07	04	10	-	06	02
Weighted percentage of Course contribution to POs	2	1.44	2.13	2.56	0	2.67	1.21

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

1. To manipulate operations on matrices.
2. To solve the system of linear equations.
3. To plot 2D and 3D graphs.
4. To solve quadratic equations.
5. To check the given string is palindrome or not.
6. To find the binomial coefficients nC_r.
7. To generate Fibonacci numbers.
8. To solve an algebraic equation using bisection method.
9. To solve an algebraic equation using Newton Raphson method.
10. To solve first order Ordinary Differential Equations.
11. To solve second order Ordinary Differential Equations.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Mathematics
SEMESTER - VI
COMPREHENSIVE EXAMINATION (21UMAE61)
(From 2021-2022 Batch onwards)

CREDIT: 1 **EXT. MARKS : 100**
MAX. MARKS: 100

Preamble

This course assesses the overall knowledge acquired by the student over 3 years of study in the UG programme focused on the field of Mathematics and its applications through the mode of viva voce.

Course Outcomes (CO)

On successful completion of the course, the learners should be able to
CO1[K1]: identify the various tools in techniques in Mathematics
CO2[K2]: interpret mathematical definitions and statements
CO3[K2]: explain the mathematical facts and concepts
CO4[K3]: articulate the mathematical problems and the methods of solving it
CO5[K4]: examine the results of mathematical problems

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	2	1	2	-	1	1
CO2 [K2]	2	2	1	2	-	1	1
CO3 [K2]	2	2	1	2	-	1	1
CO4 [K3]	2	2	1	2	-	2	2
CO5 [K4]	2	2	1	2	1	2	2
Weightage of the course	10	10	05	10	01	07	07
Weighted percentage of Course contribution to POs	1.67	2.06	2.66	2.56	1.04	3.11	4.24

Based on the level of contribution('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

Guidelines

1. Each student has to undergo a comprehensive viva exam at the end of the VI semester.

2. The comprehensive viva-voce will assess the overall knowledge of the students in the relevant field acquired over 3 years of study in the under-graduate programme
3. The viva-voce board shall consist of the External Examiner/Head of the Department and the Internal Examiner

Courses offered to Other Departments

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Physics/Chemistry
SEMESTER - I
ALLIED COURSE - I: MATHEMATICS - I (21UPHA11/21UCHA11)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 5 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to some mathematical tools and methods that can be apply to problems in Physics and Chemistry.

Course Outcomes (CO)

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

CO1[K2]: express the relation between roots and coefficients of polynomial equations

CO2[K2]: calculate the derivative, integral, Laplace transform of functions

CO3[K3]: solve algebraic and transcendental equations numerically

CO4[K4]: investigate homogeneous function and Euler's theorem

CO5[K5]: determine the appropriate Fourier series expansion for functions

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	-	1	-	1	-
CO2[K2]	3	2	1	1	-	1	-
CO3[K3]	3	2	1	1	-	1	-
CO4[K4]	3	2	1	1	-	1	1
CO5[K5]	3	2	1	-	1	1	1
Weightage of the course	15	10	04	04	01	05	02
Weighted percentage of Course contribution to POs							

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I **(18 hrs)**

Theory of Equations: Introduction – Formation of Equations – Relation between Roots and Coefficients. **Algebaric and Transcendental Equations:** Introduction – Errors in Numerical Computation – Iteration Method – Bisection

Method.

UNIT II **(18 hrs)**

Regula Falsi Method – Newton-Raphson Method. **Differentiation:** Higher Derivatives – n^{th} Derivative of some Standard Functions.

UNIT III **(18 hrs)**

Leibnitz's Theorem – Partial Differentiation – Homogeneous Function and Euler's Theorem.

UNIT IV **(18 hrs)**

Evaluation of Integrals: Evaluation of Definite Integrals – Integration by Parts. **Fourier Series:** The Cosine and Sine Series.

UNIT V **(18 hrs)**

Laplace Transform: Introduction – Laplace Transform – Inverse Laplace Transform.

TEXTBOOKS

1. Arumugam, S., Thangapandi Issac, A. and Somasundaram, A. *Numerical Methods*. Chennai: Scitech Publications (India) Pvt. Ltd, 2007. **(UNITS I & II)**
2. Arumugam, S. and Thangapandi Issac, A. *Calculus.* Palayamkottai: New Gamma Publishing House, 2014. **(UNITS II, III & IV)**
3. Arumugam, S. and Thangapandi Issac, A. *Ancillary Mathematics Paper II (Revised).* Palayamkottai: New Gamma Publishing House, 2004. **(UNIT V)**

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1. Narayanan, S. and Manicavachagom Pillay, T.K. *Calculus - Volume III*. Chennai: S.Viswanathan (Printers & Publishers), PVT., LTD, Revised 18th Edition, 2016.
2. Vittal, P.R. *Differential Equations, Fourier Series and Laplace Transforms, Probability*. Chennai: Margham Publications, Third Revised Edition, 2002.
3. Kalavathy, S. *Numerical Methods*. Chennai: Vijay Nicole Imprints Private Limited., 2004.

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2. https://www.cliffsnotes.com/study-guides/calculus/calculus/the-derivative/higher-order-derivatives
3. https://byjus.com/jee/higher-order-derivatives-of-functions-in-parametric-form/
4. https://theengineeringmaths.com/wp-content/uploads/2017/08/Chapter-1-Successive-Differentiation-.pdf

5. https://tutorial.math.lamar.edu/classes/calcii/integrationbyparts.aspx
6. https://khitguntur.ac.in/shmat/M-II%20Unit%203%20material.pdf
7. https://www.math.tamu.edu/~francis.narcowich/m414/m414_notes/m414_half_intervals.html
8. https://lecturenotes.in/m/28397-jay-bhatt-professor-of-mathematics-hgce-ch-5-laplace-transform?reading=true

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme – B.Sc. (COMPUTER SCIENCE/INFORMATION TECHNOLOGY)/BCA
SEMESTER- I
ALLIED COURSE-I: MATHEMATICAL FOUNDATIONS
(21UCSA11/21UITA11/21UCAA11)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT.MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to some concepts and notations that are useful in studying and describing objects and problems in branches of Computer Science and applications.

Course Outcomes (CO)

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

CO1[K1]: define the discrete objects in the context of mathematical structures for computer science and applications
CO2[K2]: recognize the properties of set operations and types of functions
CO3[K3]: calculate the rank, inverse matrix of a matrix
CO4[K4]: analyze the truth values of statements with reference to propositional logic
CO5[K5]: determine the appropriate algorithm to solve graph optimization problems

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	-	-	-	-	-
CO2[K2]	2	2	1	1	-	-	-
CO3[K3]	2	3	2	1	-	1	1
CO4[K4]	2	3	2	1	-	1	1
CO5[K5]	2	3	2	1	-	1	1
Weightage of the course	11	13	07	04	-	03	03
Weighted percentage of Course contribution to POs							

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(12 hrs)**

Set Theory: Introduction – Sets – Notation and Description of Sets – Subsets – Venn-Euler Diagram – Operations on Sets – Properties of Set Operations. **Relations:** Cartesian Product of Two Sets – Relations – Representation of a Relation – Operations on Relations – Equivalence Relations. **Functions:** Functions and Operators – One-to-one, Onto Functions – Special Types of Functions – Invertible Functions.

UNIT II **(12 hrs)**

Matrix Algebra: Introduction – Matrix Operations – The Inverse of a Square Matrix–Elementary Operations and Rank of a Matrix.

UNIT III **(12 hrs)**

Logic: Introduction – TF - Statements – Connectives – Atomic and Compound Statements – Well-Formed (Statement) Formulae – The Truth Table of a Formula –Tautology – Tautological Implications and Equivalence of Formulae – Replacement Process.

UNIT IV **(12 hrs)**

Graphs : Graph – Finite and Infinite Graphs – Directed and Undirected Graphs – Basic Terminologies – Matrix Representation of Graphs – Subgraph – Walks – Closed Walk – Open Walk – Path – Length of the Path – Circuit or Cycle or Elementary Cycle, Circular Path – Connected – Eulerian Graphs – Operations of Graphs – Hamiltonian Graph – Complete Undirected Graph – Weighted Graph – Graph Optimisation Problems.

UNIT V **(12 hrs)**

Trees : Acyclic Graph – Tree – Forest – Some Properties of Trees – Pendant Vertices in a Tree – Distance in a Tree – Eccentricity of a Vertex – Center of a Tree – Rooted Tree – Subtree – Binary Trees – Properties of Binary Trees – Counting Trees – Spanning Trees – Weighted Graph – Minimum Spanning Tree.

TEXTBOOKS

1. Venkataraman, M.K., Sridharan, N. and Chandrasekaran, N. *Discrete Mathematics.* Chennai: The National Publishing Company, 2011. **(UNITS I, II & III)**
2. Geetha, P. *Graph Theory.* Chennai: Scitech Publications (India) Pvt. Ltd, 2009. **(UNITS IV & V)**

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1. Shanker Rao, G. *Discrete Mathematical Structures.* New Delhi: New Age International (P) Limited Publishers, 2002.

2. Goudru, N.G. *Discrete Mathematical Structures.* Mumbai: Himalaya Publishing House, 2003.
3. Vatsa, B.S. and Suchi Vatsa. *Discrete Mathematics.* New Delhi: New Age International (P) Limited Publishers, Fourth Revised Edition, 2012.

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5. https://www.google.co.in/books/edition/DISCRETE_MATHEMATICS_AND_GRAPH_THEORY/1ZBeBAAAQBAJ?hl=en&gbpv=1&dq=discrete+mathematics+with+graph+theory&printsec=frontcover
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Physics/Chemistry
SEMESTER - II
ALLIED COURSE - II: MATHEMATICS - II (21UPHA21/21UCHA21)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 5 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to some mathematical tools and methods that can be apply to problems in Physics and Chemistry.

Course Outcomes (CO)

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

CO1[K2]: indicate the binomial series representation of functions and the exponential series

CO2[K2]: explain gradient of a scalar valued function, divergence and curl of a vector valued function and its properties, rank of a matrix

CO3[K3]: compute inverse of a matrix using Cayley-Hamilton theorem, eigen values and eigen vectors of a square matrix

CO4[K4]: appraise equivalent definitions of a group, properties of a group

CO5[K5]: determine the mathematical function that has the best fit to a series of data points

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	-	1	-	1	-
CO2[K2]	3	2	-	1	-	1	-
CO3[K3]	3	2	2	1	-	1	-
CO4[K4]	3	2	1	1	-	1	1
CO5[K5]	3	2	1	-	1	1	1
Weightage of the course	15	10	04	04	01	05	02
Weighted percentage of Course contribution to POs							

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I **(18 hrs)**

Summation of Series: Binomial Series – Exponential Series.

UNIT II **(18 hrs)**

Vector Calculus: Introduction – Vector Algebra – Differentiation of Vectors – Gradient – Velocity and Acceleration – Divergence and Curl.

UNIT III **(18 hrs)**

Matrices: Introduction – Matrices – Simultaneous Linear Equations – Cayley Hamilton Theorem – Eigen Values and Eigen Vectors.

UNIT IV **(18 hrs)**

Groups: Definition and Examples – Elementary Properties of a Group – Equivalent Definitions of a Group – Permutation Groups.

UNIT V **(18 hrs)**

Straight Lines: Equation of a Straight Line. **Curve Fitting:** Introduction – Linear Law – Method of Group Averages – Method of Least Squares.

TEXTBOOKS

1. Arumugam, S. and Thangapandi Issac, A. *Ancillary Mathematics Paper I (Revised)*. Palayamkottai: New Gamma Publishing House, 2002. **(UNITS I & V)**
2. Arumugam, S. and Thangapandi Issac, A. *Ancillary Mathematics Paper II (Revised).* Palayamkottai: New Gamma Publishing House, 2004. **(UNIT II)**
3. Arumugam, S. and Thangapandi Issac, A. *Ancillary Mathematics Paper III.* Palayamkottai: New Gamma Publishing House, 2006. **(UNITS III & IV)**
4. Arumugam, S., Thangapandi Issac, A., and Somasundaram, A. *Numerical Methods.* Chennai: Scitech Publications (India) Pvt. Ltd, Second Edition, 2007. **(UNIT V)**

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1. Manicavachagom Pillay, T.K., Natarajan, T. and Ganapathy, K.S. *Algebra– Volume II. Chennai:* S.Viswanathan (Printers & Publishers) Pvt. Ltd., 2006.
2. Arumugam, S. and Thangapandi Issac, A.*Modern Algebra*. Chennai: Scitech Publications (India) Pvt.Ltd, 2008.
3. Arumugam, S. and Thangapandi Issac, A. *Algebra Theory of Equations, Theory of Numbers and Trigonometry.* Palayamkottai: New Gamma Publishing House, 2011.

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4. https://www.sjsu.edu/me/docs/hsu- Chapter%203%20Vectors%20and%20Vector%20Calculus%20pdf.pdf
5. https://byjus.com/maths/eigen-values/
6. https://groupprops.subwiki.org/wiki/Equivalence_of_definitions_of_group
7. https://ncert.nic.in/ncerts/l/keep210.pdf
8. https://nptel.ac.in/content/storage2/courses/122104019/numerical-analysis/Rathish-kumar/least-square/r1.htm

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. (COMPUTER SCIENCE/INFORMATION TECHNOLOGY)/BCA
SEMESTER - II
ALLIED COURSE - II: OPERATIONS RESEARCH
(21UCSA21/21UITA21/21UCAA21)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the importance of Operations Research and some techniques to arrive at optimal solutions to complex decision-making problems.

Course Outcomes (CO)

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

CO1[K1]: state the scope, phases of operations Research and the classification of optimization models

CO2[K2]: explain the computational algorithms for various optimization methods

CO3[K3]: compute optimum solution of the linear programming, transportation, and assignment problems

CO4[K4]: examine the solutions of the optimization problems

CO5[K6]: formulate the mathematical expression of the linear programming model from the study of the situation and derive solutions to the problem

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	1	1	-	-	-	-	-
CO2[K2]	2	3	1	1	-	-	-
CO3[K3]	2	3	2	1	-	1	1
CO4[K4]	2	3	2	1	-	1	1
CO5[K6]	2	3	2	1	-	2	2
Weightage of the course	09	13	07	04	-	04	04
Weighted percentage of Course							

contribution to POs							

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(12 hrs)**

Origin and Development of OR: Introduction – Definitions – Scope of Operations Research – Phases of OR – Models in Operations Research – Advantages of a Model – Classification of Models. **Linear Programming:** Introduction –Formulation of LP Problems.

UNIT II **(12 hrs)**

Graphical Method: Procedure of Solving LPP by Graphical Method – General Formulation of LPP – Matrix Form of LPP – Some Important Definitions – Canonical or Standard Forms of LPP. **Simplex Method:** Introduction – Definition – Simplex Algorithm.

UNIT III **(12 hrs)**

Artificial Variables Technique: Introduction – The Big M Method – Two phase Simplex Method – Degeneracy – Unbounded Solution.

UNIT IV **(12 hrs)**

Transportation Problem: Introduction –Mathematical Formulation – Definitions – Optimal Solution – Optimality Test.

UNIT V **(12 hrs)**

Assignment Problem: Introduction – Definition – Hungarian Method Procedure – Unbalanced Assignment Problem–Maximisation in Assignment Problem.

TEXTBOOK

1. Kalavathy, S. *Operations Research.* NewDelhi: Vikas Publishing House Pvt Ltd, Second Edition, 2007.

REFERENCES

Books

1. Arumugam, S. and Thangapandi Issac, A. *Operations Researchs Volume (Linear Programming).* Palayamkottai: New Gamma Publishing House, 2003.
2. Sharma, S.D. *Operations Research.* Meerut: Kedar Nath Ram Nath & Co, 2000.
3. Panneerselvam, R. *Operations Research.* New Delhi: Prentice Hall of India Private Limited, Second Edition, 2006.

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3. https://youtu.be/BUGIhEecipE

4. https://www.google.co.in/books/edition/Operations_research/Ez_JBUtbglIC?hl=en&gbpv=1&dq=operation+research+by+gupta&printsec=frontcover
5. https://www.google.co.in/books/edition/Operations_Research/0EE8BAAAQBAJ?hl=en&gbpv=1&dq=operation+research+by+gupta&printsec=frontcover

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Computer Science
SEMESTER - III
ALLIED COURSE - III: NUMERICAL METHODS FOR SCIENTIFIC COMPUTATION (21UCSA31)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 10**

Preamble

This course introduces the learners to some basic techniques for the efficient numerical solution of problems in science and analyze approximation errors in the process of computation.

Course Outcomes (CO)

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

CO1[K2]: explain the methods of solving the problems in science numerically

CO2[K3]: apply numerical methods to obtain approximate solutions of algebraic, transcendental and differential equations

CO3[K3]: apply numerical techniques to compute numerical differentiation and integration of given functions

CO4[K4]: analyze error arising in numerical computation of solutions to mathematical and applied problems

CO5[K5]: determine the method of interpolation to estimate the unknown data value between known data values

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	2	2	1	1	-	-	-
CO2[K3]	2	2	1	1	-	1	1
CO3[K3]	2	2	1	1	-	1	1
CO4[K4]	2	3	2	1	-	1	1
CO5[K5]	2	3	2	1	-	1	1
Weightage of the course	10	12	07	05	-	04	04
Weighted percentage of Course contribution to POs							

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low,'-' No Correlation)

UNIT I **(12 hrs)**

Numerical Solutions of Algebraic and Transcendental Equation: Introduction – Horner's Method – Bolzano's Bisection Method – Fixed Point Iteration or Simple Iteration Method – Method of False Position (Regula Falsi Method) – Newton Raphson Method – Muller Method – Chebyshev Method.

UNIT II **(12 hrs)**

Solution of Simultaneous Linear Algebraic Equations and Eigen value Problems: Introduction **–** Direct Methods-Gauss Elimination Method – Gauss Jordan Elimination Method – Method of Triangular Decomposition or Factorization – Crout's Reduction Method – Iterative Methods of Solving Simultaneous Equations – Jacobi's Method – Gauss Seidel Iteration Method.

UNIT III **(12 hrs)**

Interpolation with Equal Intervals: Introduction – Gregory Newton's Forward Interpolation Formula for Equal Intervals – Gregory Newton's Backward Interpolation Formula for Equal Intervals – Central Difference Interpolation Formulae – Gauss's Forward Interpolation Formula – Gauss's Backward Interpolation Formula – Stirling's Interpolation Formula – Bessel's Interpolation Formula – Laplace Everett Interpolation Formula – Relation Between Bessel's and Laplace Everett Formula. **Interpolation with Unequal Intervals :** Introduction – Divided Differences – Properties of Divided Differences – Lagrange's Interpolation Formula for Unequal Intervals – Alternative Form of Lagrange's Formula.

UNIT IV **(12 hrs)**

Numerical Differentiation and Integration: Introduction – Values of the Derivatives of y, Based on Newton's Forward Interpolation Formula – Values of Derivatives of y, Based on Newton's Backward Interpolation Formula – Values of Derivatives of y, Based on Stirling's Formula – Numerical Integration – Newton's-Cote's Quadrature Formula – Trapezoidal Rule – Composite Trapezoidal Rule – Truncation Error in Trapezoidal Rule – Simpson's One Third Rule – Composite Simpson's One Third Rule – Truncation Error in Simpson's One Third Rule – Simpson's Three Eighths Rule – Composite Simpson's Three Eighths Rule – Weddle's Rule – Composite Weddle's Rule – Romberg's Method.

Unit V **(12 hrs)**

Numerical Solution of Ordinary Differential Equations: Introduction – Numerical Solution of a Differential Equation – Euler's and Runge Kutta's Methods – Comparison of Taylor Series Method and R.K.Method – Local and Global Truncation Errors.

TEXTBOOK

1. Veerarajan, T. and Ramachandran, T. *Numerical Methods With Programs in C*. New Delhi : Tata McGraw – Hill Publishing Company Limited, Second Edition, 2007.

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1. Kandasamy, P., Thilagavathy, K. and Gunavathi, K. *Numerical Methods*. New Delhi : S.Chand and Company Ltd, 2012.
2. Kalavathy, S. *Numerical Methods*. Chennai : Vijay Nicole Imprints Pvt Ltd, 2004.
3. Arumugam, S., Thangapandi Isaac, A. and Somasundaram, A. *Numerical Methods.* Chennai : Scitech Publications (India) Pvt Ltd, 2009.

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