ABOUT THE DEPARTMENT

The Department of Mathematics was established in the year 1975 with under graduate programme and upgraded as PG Department in the year 1986. The Department consists of 10 teaching staff. The Department has been producing exemplary results and university rank holders right from its inception. The Department is constantly concentrating on the overall development of students. So far forty-three batches of UG students and thirty-three batches of PG students have successfully finished their courses and professionally placed as Auditors, Income tax officers, Assistant commissioner of police, Lawyers, Project leaders, HR in various MNC. Many students have joined in prestigious institutions like M.I.T., I.I.T., C.M.I., M.K.U., Sourashtra College, etc., for their higher studies and have been well placed in various fields in India and abroad. The Department library consists of approximately 1500 books which is useful for lending purpose to students and staff. Department is equipped with 2 computers and one printer. We have well-furnished classrooms and a separate room with LCD Projector for conducting seminars. The Department motivates the students to take part in all the job oriented competitive examinations like UPSC., SSC., TNPSC., RRB., NET, SLET, Bank exams etc., The Department has separate library (Donors book bank) with more than 200 books related to job oriented competitive examinations donated by the Staff members of the Department and Alumni. The Department is providing RO water to all students which is sponsored by our Alumni.

VISION

Aims to create an erudite, disciplined and well-rounded mathematician by imparting high quality subject knowledge and life values to excel both academically and professionally.

MISSION

- To guide, teach mathematical knowledge and support the students towards mathematical excellence by embracing them into our group of mathematicians, share our ideas, grow in knowledge and thus improving their capabilities and apply all learned concepts to excel in all fields.
- To develop quantitative, computational, reasoning, problem solving skills and critical thinking for the upcoming mathematicians to model, formulate and solve real life applications.
- To encourage the students with strong foundational skills and abilities to pursue higher studies and research.

GRADUATE ATTRIBUTES

1. **(KB) A knowledge base for Mathematics**: Demonstrated competence in university level Mathematics, fundamentals of Mathematics, and specialized Mathematics knowledge appropriate to the program.

2. **(PA) Problem analysis**: An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve Mathematical problems in order to reach substantiated conclusions

3. **(Inv.) Investigation**: An ability to conduct investigations of complex problems by methods that include appropriate analysis and interpretation of data and synthesis of information in order to reach valid conclusions.

4. **(Tools) Use of mathematical tools**: An ability to create, select, apply, adapt, and extend appropriate techniques, resources to a range of mathematical activities, from simple to complex, with an understanding of the associated limitations.

5. **(Team) Individual and teamwork**: An ability to work effectively as a member and leader in teams, preferably in a multi–disciplinary setting.

6. **(Comm.) Communication skills**: An ability to communicate mathematical concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and documentation, and to give and effectively respond to clear instructions.

7. **(Prof.) Professionalism**: An understanding of the roles and responsibilities of the professional Mathematician in society, especially the primary role of protection of the public and the public interest.

8. **(Ethics) Ethics and equity**: An ability to apply professional ethics, accountability, and equity.

9. **(LL) Life–long learning**: An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO 1	To gain knowledge in foundational areas of Mathematics
PEO 2	To communicate mathematics accurately, precisely and effectively
PEO 3	To develop mathematical thinking
PEO 4	To apply mathematical knowledge
PEO 5	To be able to solve mathematical problems using technology
PEO 6	To develop teaching skills, subject knowledge in the course of their study which will help them to shine in various fields including education, IT sector etc.,

PROGRAMME OUTCOMES (POs)

Postgraduate **M.Sc. Mathematics** is a **2 – year** degree programme with 4 semesters consisting of the following Programme Outcomes (POs). The students will be able to

PO 1	apply knowledge of mathematics to become competent professionals.
PO 2	identify and solve complex scientific problems using mathematical skills
PO 3	apply the mathematical concepts for the analysis and interpretational data
PO 4	enhance and adopt skills required for higher order employment or jobs through activities such as seminars, workshops and conferences.
PO 5	select, design and apply appropriate computational techniques to solve and models physical problems.
PO 6	Skill Development and Employable Abilities: Adequate training in relevant skill sector and creating employable abilities among the under graduates.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

On completion of **M.Sc. Mathematics Programme**, the students are expected to

PSO1	understand the mathematical concepts and applications in various fields.
PSO2	handle the advanced techniques in various fields to solve variety of problems related to real life problems.
PSO3	have necessary skills and expertise in the field of research and developments through seminars and dissertation.
PSO4	learn abstract algebraic structures and topological structures.
PSO5	learn methods of finding optimal solutions of physical and industrial problems.
PEO 6	develop teaching skills, subject knowledge in the course of their study which will help them to shine in various fields including education, IT sector etc.,

DISTRIBUTION OF CREDITS (PG PROGRAMME)

	SEMESTER	COURSES	NUMBER OF COURSES	HOURS	CREDITS	TOTAL CREDITS
	I-II	**CORE**	**8**	**6**	**4**	**32**
	III-IV	**CORE**	**8**	**6**	**5**	**40**
	I-II	**ELECTIVE**	**2**	**6**	**4**	**8**
	IV	**ELECTIVE**	**1**	**6**	**5**	**5**
	III	**NON MAJOR ELECTIVE (NME)**	**1**	**6**	**5**	**5**
	III	**INTERNSHIP**	**1**		**1**	**1**
TOTAL CREDITS						**91**

M.Sc. MATHEMATICS – COURSE STRUCTURE

SEMESTER – I

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	24PMSC11	**Core – 1:** Algebra – I	6	3	25	75	100	4
2	24PMSC12	**Core – 2:** Analysis – I	6	3	25	75	100	4
3	24PMSC13	**Core – 3:** Discrete Mathematics	6	3	25	75	100	4
4	24PMSC14	**Core – 4:** Topology	6	3	25	75	100	4
5	24PMSE11	**Elective – 1:** * Graph Theory and Applications	6	3	25	75	100	4
6	24PMSE12	**Elective – 2:** * Differential Geometry	6	3	25	75	100	4
		TOTAL	**30**					**20**

***One elective be chosen from Elective 1 and Elective 2**

SEMESTER – II

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	24PMSC21	**Core – 5:** Algebra – II	6	3	25	75	100	4
2	24PMSC22	**Core – 6:** Analysis – II	6	3	25	75	100	4
3	24PMSC23	**Core – 7:** Differential Equations	6	3	25	75	100	4
4	24PMSC24	**Core – 8:** Numerical Analysis	6	3	25	75	100	4
5	24PMSE21	**Elective – 3:** * Advance Mechanics	6	3	25	75	100	4
6	24PMSE22	**Elective – 4:** * Fuzzy sets and their Applications	6		25	75		4
7	24PMSE23	**Elective – 5:** * **Theory** - Visual Basic	4		25	75		3
8	24PMSEP1	**Elective – 5: * LAB** – Visual Basic Lab	2		40	60		1
9		**Internship**	-	-	-	-	-	-
		TOTAL	30					20

***One elective to be chosen from Elective 3, Elective 4 and Elective 5**

SEMESTER – III

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1		**Core – 9:** Algebra – III	6	3	25	75	100	5
2		**Core – 10:** Analysis – III	6	3	25	75	100	5
3		**Core – 11:** Functional Analysis – I	6	3	25	75	100	5
4		**Core – 12:** Statistics – I	6	3	25	75	100	5
		NME:*						
5		Business Statistics / Mathematics for Competitive Examinations	6	3	25	75	100	5
6		Internship	-	-	40	60	100	1
		TOTAL	**30**					**26**

***One NME course to be chosen from TWO courses**

SEMESTER – IV

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1		**Core – 13:** Complex analysis	6	3	25	75	100	5
2		**Core – 14:** Number theory	6	3	25	75	100	5
3		**Core – 15:** Operations Research	6	3	25	75	100	5
4		**Core – 16:** Statistics II	6	3	25	75	100	5
		ELECTIVE:*						
5		Advanced Topology / Functional Analysis II	6	3	25	75	100	5
		TOTAL	30					25

***One elective course to be chosen from TWO courses**

COURSE STRUCTURE – SEMESTER I

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	24PMSC11	**Core – 1:** Algebra – I	6	3	25	75	100	4
2	24PMSC12	**Core – 2:** Analysis – I	6	3	25	75	100	4
3	24PMSC13	**Core – 3:** Discrete Mathematics	6	3	25	75	100	4
4	24PMSC14	**Core – 4:** Topology	6	3	25	75	100	4
5	24PMSE11	**Elective – 1:*** Graph theory and Applications	6	3	25	75	100	4
6	24PMSE12	**Elective – 2:*** Differential Geometry						
		TOTAL	**30**					**20**

***One elective be chosen from Elective 1 and Elective 2**

CA – Class Assessment (Internal)

SE – Summative Examination

SBS – Skill Based Subject

NME – Non – Major Elective

T – Theory

P – Practical

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSC11	ALGEBRA – I	CORE – 1	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION :

In general, this course describes different algebraic structures and counting principle in different way and application of Sylow's theorems and ideals and maximal ideals of the given ring R and uniqueness of prime factorization of an element of an Euclidean ring and Fermat two square theorems and theorems about Unique factorization theorem.

COURSE OBJECTIVES :

Groups and Rings is a very important branch of Mathematics. To introduce the concepts and to develop working knowledge on Groups, Normal Subgroups, Automorphism groups, Finite groups and Rings.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the concepts counting principle and Sylow's theorem	**Upto K5**
CO 2	analyze finite Abelian groups	**Upto K5**
CO 3	explain rings and its applications	**Upto K5**
CO 4	provide information about Euclidean rings	**Upto K5**
CO 5	concentrate on Polynomial rings	**Upto K5**

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

ALGEBRA – I

UNIT– I:
Another Counting Principle, Sylow's Theorem
(Sections 2.11, 2.12)

UNIT– II:
Direct Products, Finite Abelian Groups
(Sections 2.13, 2.14)

UNIT– III:
Ideals and Quotient Rings, More Ideals and Quotient Rings, The Field of Quotients of an Integral Domain
(Sections 3.4, 3.5, 3.6)

UNIT– IV:
Euclidean Rings, A particular Euclidean Rings
(Sections 3.7, 3.8)

UNIT– V:
Polynomials over Commutative Rings
(Sections 3.11)

TEXT BOOK:
Topics in Algebra by I.N. Herstein, Second Edition, John Wiley and Sons, 1999

Unit – I	:	Chapter 2 : 2.11, 2.12
Unit – II	:	Chapter 2 : 2.13, 2.14
Unit – III	:	Chapter 3 : 3.4, 3.5, 3.6
Unit – IV	:	Chapter 3 : 3.7, 3.8
Unit – V	:	Chapter 3 : 3.11

REFERENCE BOOKS :

1. ***Modern Algebra*** by Vikas Khanna – Vikas Publications
2. ***Modern Algebra*** (Abstract Algebra) by A.R. Vasishtha - Krishna Prakashan Mandir

Mapping of CO with PSO :

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**2**	-	-	-	-	-
CO2	-	**3**	-	-	-	-
CO3	-	-	-	-	**2**	**1**
CO4	-	-	-	**3**	-	-
CO5	-	-	-	-	-	**3**

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: **Prof. E. B. BALARAMAN**

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSC12	ANALYSIS – I	CORE – 2	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

NATURE OF COURSE	Employability	Skill Oriented	Entrepreneurship
	✓	✓	

COURCE DESCRIPTION:

This course is designed to explain various concepts used to learn Analysis.

COURCE OBJECTIVES :

- To discuss main concepts of Analysis
- To recall the facts about numerical sequences and series
- To explain tests used to test series.
- To define the basic terms of limits of function and describe connectedness.
- To discuss differentiation

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	to prove theorems using relevant definitions	Upto K5
CO 2	to describe the concepts of convergent, Cauchy sequence and provide the proof of numbers	Upto K5
CO 3	to compare and identify suitable test to test series.	Upto K5
CO 4	to apply connectedness concepts to prove theorems.	Upto K5
CO 5	to prove theorem based on the Derivative of Real Function.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

ANALYSIS – I

UNIT– I:
Compact sets – Perfect sets – Connected sets

UNIT– II:
Convergent sequences – Subsequences – Cauchy sequences – Upper and lower limits Some special sequences – Series of Non negative terms – The Numbers

UNIT– III:
The Root and Ratio test – Power series – Summation by parts – Absolute Convergence – Addition and Multiplication of series – Rearrangements

UNIT– IV:
Limits of Function – Continuous Function – Continuity and Connectedness – Monotonic Function – Infinite Limits – Limits at Infinity

UNIT– V:
The Derivative of Real Function – Mean value theorem – The Continuity derivatives – Hospital's Rule – Derivatives of Higher Order – Taylor's theorem – Differentiation of Vector Valued Function

REVIEW: Finite, countable, uncountable sets and Metric spaces
(NOT FOR EXAMINATION)

TEXT BOOK:
Principles of Mathematical Analysis by Walter Rudin - Third Edition, 1976.

UNIT I	(Sec 2.31 – 2.47)
UNIT II	(Sec 3.1 – 3.32)
UNIT III	(Sec 3.33 3.55)
UNIT IV	(Sec 4.1 – 4.34)
UNIT V	(Sec 5.1 – 5.19)

REFERENCE BOOKS :

1. ***Mathematical Analysis*** by Tom M Apostal, Narosa Publishing House, 1985
2. ***Methods of Real Analysis*** by Richard R Goldberg, Blaisdell Publishing company, 2009.

Mapping of CO with PSO :

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**2**	**-**	**-**	**-**	**-**	**-**
CO2	**-**	**3**	**-**	**-**	**-**	**-**
CO3	**-**	**-**	**-**	**-**	**2**	**1**
CO4	**-**	**-**	**-**	**3**	**-**	**-**
CO5	**-**	**-**	**-**	**-**	**-**	**3**

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Dr. T. R. DINAKARAN

Passed in the BoS Meeting held on 09/03/2024 Signature of the Chairman

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSC13	DISCRETE MATHEMATICS	CORE – 3	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE ESCRIPTION :

The content of Discrete Mathematics includes the mathematics of making social decisions and proofs, learn about induction, strong induction and other types of proofs.

COURSE OBJECTIVE :

To enable the students to understand the concepts of connectives, truth tables, PCNF and PDNF, Grammar and Language, Lattices and to gain knowledge about special lattices and Boolean expressions and to apply the knowledge gained in solving problems.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the concepts of connectives, truth tables, tautologies and contradiction, equivalence of formulas.	Upto K5
CO 2	gain knowledge about Principal Conjunctive and Disjunctive Normal Forms.	Upto K5
CO 3	understand Grammar and Language and analyzes Polish Expressions and Complications.	Upto K5
CO 4	gain knowledge about Lattices, Direct Product of Lattices.	Upto K5
CO 5	understand the concepts of Special Lattices, Boolean Algebra and Boolean Functions and applies them to find the values of Boolean Expressions.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

DISCRETE MATHEMATICS

UNIT– I:
Statement and notations – connectives – negation, conjunction, disjunction – statement formulae – truth tables – conditional and bi conditional – well-formed formulae – tautologies – equivalence of formulae.

UNIT– II:
Duality law – tautological implications – normal forms – conjunctive normal form – principal disjunctive normal forms – rules of inference.

UNIT– III:
Grammar and Languages – polish expressions and complications

UNIT– IV:
Lattices – definition and properties of lattices – lattices algebraic system – sub-lattices – direct product and homomorphism

UNIT– V:
Some special lattices – Boolean algebra – definition and examples – Boolean functions – values of Boolean expressions and Boolean functions

TEXT BOOK:
Discrete Mathematical Structures with applications to Computer Science by J.P. Tremblay and R.Manohar. McGraw Hill International Editions

Unit I : 1.1, 1.2.1 to 1.2.4, 1.2.6 to 1.2.9
Unit II : 1.2.10, 1.2.11, 1.3.1 to 1.3.4
Unit III : 3.3, 3.4
Unit IV : 4.1.1 to 4.1.4
Unit V : 4.2.1, 4.2.2, 4.3.1, 4.3.2

REFERENCE BOOK:
1. ***Discrete Mathematics*** by Seymour Lipschutz, Marc Lars Lipson, McGraw Hill Education (INDIA)Private limited
2. ***Discrete Mathematics (second edition)*** by Kenneth A. Ross and Charles R.B. Wright Prentice-Hall International Editions

Mapping of CO with PSO :

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	-	-	-	-
CO2	-	2	-	-	-	-
CO3	-	-	3	-	-	-
CO4	2	-	-	-	-	-
CO5	-	2	-	-	2	-

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. E. B. BALARAMAN

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSC14	TOPOLOGY	CORE – 4	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION;

To enable the students to acquire the knowledge of topology.
To understand the concepts of various topologies and its applications.

COURSE OBJECTIVES :

- To define various topological on the spaces.
- To explain continuous functions, product topology and metric topology.
- To discuss the connected spaces and compact spaces and theorems.
- To explain the definition of various axioms and theorems.
- To say about the normal spaces and Urysohn theorem.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	identify the category of various topology on the given spaces	Upto K5
CO 2	describe the continuous function and product topology concepts.	Upto K5
CO 3	find the given spaces are connected or not and also to identify the compact spaces.	Upto K5
CO 4	prove theorems based on countability axioms and separation axiom.	Upto K5
CO 5	explain the normal spaces concepts an d to prove the urysohnmetrization theorem and lemma.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

TOPOLOGY

UNIT– I:
Topological spaces – basis for a topology – the order topology – the product topology on XxY – the subspace topology – closed sets and limit points.

UNIT– II:
Continuous functions – the product topology – the metric topology.

UNIT– III:
Connected spaces – connected subspaces of the real line – Compact spaces – compact subspaces of the real line.

UNIT– IV:
The countability axioms – the separation axioms.

UNIT– V:
Normal spaces, the Urysohn lemma, the Urysohnmetrization Theorem.

TEXT BOOK:
Topology (Second edition) by James R Munkress, Prentice – Hall of India Pvt Ltd, New Delhi.

UNIT I	Chapter 2 (sec 12 to 17)
UNIT II	Chapter 2(Sec 18,19 and 20)
UNIT III	Chapter 3 (Sec 23,24,26 and 27)
UNIT IV	Chapter 4 (Sec 30,31)
UNIT V	Chapter 4 (Sec 32,33 and 34)

REFERENCE BOOK:
Introduction to Topology and Modern Analysis by George F Simmons, McGraw Hill Book Company Limited.

Mapping of CO with PSO :

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**-**	**-**	**-**	**-**	**-**
CO2	**-**	**2**	**-**	**-**	**-**	**-**
CO3	**-**	**-**	**3**	**-**	**2**	**1**
CO4	**2-**	**-**	**-**	**3**	**-**	**-**
CO5	**-**	**2**	**-**	**-**	**3**	**-**

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. M. N. SAROJA

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSE11	GRAPH THEORY AND APPLICATIONS	ELECTIVE – 1	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION :

This course enables the students to study the advanced concepts in graph theory. Some classical problems are also introduced such as Chinese Postman problem, Travelling salesman problem and Personnel assignment problem.

COURCE OBJECTIVES :

- To discuss main concepts of Graph Theory
- To discuss about trees, cut edges, bonds and Cayley's formula.
- To explain Euler tours, Hamiltonian cycles.
- To define Matchings and coverings.
- To discuss Chromatic number and Vizing theorem

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	solve shortest path problems	Upto K5
CO 2	describe the concepts of trees, cut vertices and blocks	Upto K5
CO 3	solve theorems in Eulerian and Hamiltonian graphs.	Upto K5
CO 4	identify matchings and coverings	Upto K5
CO 5	find the chromatic number of a graph.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

GRAPH THEORY AND APPLICATIONS

UNIT– I:

Graphs and simple graphs, Graph isomorphism, The incidence and adjacency matrices, Sub graphs, Vertex degrees, Paths and connection, cycles, The shortest path problem, Sperner's Lemma

UNIT– II:

Trees, Cut edges and Bonds, Cut vertices, Cayley's formula, The connector problem, Connectivity, Blocks, Construction of Reliable communications Network.

UNIT– III:

Euler tours, Hamilton cycles, The Chinese postman problem, The travelling salesman problem

UNIT– IV:

Matchings, Matchings and coverings in Bipartite graphs, Perfect matching, The personnel assignment problem

UNIT– V:

Edge Chromatic number, Vizing's theorem, Chromataic number, Brook's theorem

TEXT BOOK:

Graph Theory with Applications by J.A. Bondy and U.S.R. Murty

UNIT – I Chapter 1 (Section 1.1 to 1.9)
UNIT – II Chapter 2 & 3 (Section 2.1 to 2.5 & 3.1 to 3.3)
UNIT – III Chapter 4 (Section 4.1 to 4.4)
UNIT – IV Chapter 5 (Section 5.1 to 5.4)
UNIT – V Chapter 6 (Section 6.1 & 6.2) , Chapter 8 (Sections 8.1 & 8.2)

REFERENCE BOOKS:

1. ***A first look at Graph Theory*** by J. Clark and D.A. Holton Allied Publishers
2. ***Graph Theory*** by G. Harary,

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**2**	-	-	-	-	-
CO2	-	**3**	-	-	-	-
CO3	-	-	-	-	**2**	-
CO4	-	-	-	**3**	-	-
CO5	-	-	-	-	-	**3**

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. **N. H. SARAVANAN**

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSE12	DIFFERENTIAL GEOMETRY	ELECTIVE – 2	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION :

Students in this course will learn how the concepts of calculations can be applied to understand the geometry of mathematical surfaces such as plane, sphere, helix, hyperspaces, developable and curvatures.

COURSE OBJECTIVES :

- To define space curves, tangent, normal, curvature and torsion, involutes and evolutes.
- To explain the intrinsic properties and theorems and surfaces of revolution.
- To discuss the isometric correspondence and properties of geodesics.
- To define the geodesics curvature and Gauss-bonnet theorem.
- To discuss various curvatures and developable curves.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	explain the definitions of tangent, normal, torsion and involutes and evolutes.	Upto K5
CO 2	describe the intrinsic properties and surfaces of revolution.	Upto K5
CO 3	explain the geodesics concepts and their properties.	Upto K5
CO 4	prove the theorems based on geodesics curvature and Gauss-Bonnet theorem.	Upto K5
CO 5	identify the developable curves associated with space curves and on surfaces.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

DIFFERENTIAL GEOMETRY

UNIT– I:
Introductory remarks about space curves-definitions –arc length-tangent, normal and binormal - curvature and torsion of a curve given as the intersection of two surfaces-contact between curves and surfaces – tangent surfaces, involutes and evolutes.

UNIT– II:
Intrinsic equations, fundamental existence theorem for space curves-helices. Definition of a surface, surfaces of revolution, helicoids.

UNIT– III:
Metric direction coefficients, families of curves isometric correspondence, intrinsic properties, geodesics, canonical geodesics equations, normal properties of geodesics.

UNIT– IV:
Existence theorems, geodesic curvature, Gauss – Bonnet theorem, Gaussian Curvature.

UNIT– V:
The Second fundamental form, principal curvatures –lines of curvature, developables. Developables associated with a space curves – developables associated with curves on surfaces-minimal surfaces – ruled surfaces.

TEXT BOOK :
An introduction to Differential Geometry by T J Willmore, Oxford University press.

UNIT I	Chap 1 (Sec 1 to 7)
UNIT II	Chap 1 (Sec 8,9) Chap 2 (Sec 1 to 4)
UNIT III	Chap 2 (Sec5 to 12)
UNIT IV	Chap 2 (Sec 13,15,16 and 17)
UNIT V	Chap 3 (Sec1 to 8)

REFERENCE BOOKS:
1) ***Differential Geometry*** by Mittal and Agarwal – Kedharnath Publication, Meerut
2) ***Differential Geometry*** by Somasundaram – Narosa Publications

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	-	-	-	-	-
CO2	-	**2**	-	-	-	-
CO3	-	-	**3**	-	-	-
CO4	**2**	-	-	**3**	-	-
CO5	-	**2**	-	-	**2**	-

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. N. H. SARAVANAN

COURSE STRUCTURE – SEMESTER II

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	24PMSC21	**Core – 5:** Algebra – II	6	3	25	75	100	4
2	24PMSC22	**Core – 6:** Analysis – II	6	3	25	75	100	4
3	24PMSC23	**Core – 7:** Differential Equations	6	3	25	75	100	4
4	24PMSC24	**Core – 8:** Numerical Analysis	6	3	25	75	100	4
5	24PMSE21	**Elective – 3:** Advance Mechanics	6	3	25	75	100	4
6	24PMSE22	**Elective – 4:** Fuzzy sets and their Applications	6	3	25	75	100	4
7	24PMSE23	**Elective – 5: Theory** - Visual Basic	4		25	75		3
8	24PMSEP1	**Elective – 5: LAB** – Visual Basic Lab	2		40	60		1
9		**Internship**	-	-	-	-	-	-
		TOTAL	30					20

***One elective be chosen from Elective 3, Elective 4 and Elective 5**

CA – Class Assessment (Internal)

SE – Summative Examination

SBS – Skill Based Subject

NME – Non – Major Elective

T – Theory

P – Practical

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSC21	ALGEBRA – II	CORE – 5	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	Skill Oriented	Entrepreneurship
	✓	✓	

COURSE DESCRIPTION:

This course is designed to explain various concepts, basic definition about Vector spaces, system of linear equations, properties of matrices. It is useful in Physics, Social sciences and Engineering.

COURSE OBJECTIVES :

Linear Algebra is a very important branch of Mathematics. In this course, the student learns about Vector Spaces, Inner Product Spaces, Linear Transformation on these spaces and their canonical forms and types of linear transformations.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the concepts of Linear independence, bases and Dual spaces.	Upto K5
CO 2	discuss about Algebra of Linear Transformations and Characteristics roots and Matrices.	Upto K5
CO 3	study Canonical forms Triangular forms and Nilpotent Transformations.	Upto K5
CO 4	analyze rational canonical forms Trace and transpose and Determinants.	Upto K5
CO 5	understand the concept of the Hermitian, Unitary and Normal Transformations.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

ALGEBRA – II

UNIT– I:
Dual spaces, Inner product spaces (Chapter 4: Sections 4.3,4.4)

UNIT– II:
The algebra of linear transformations, characteristic roots

UNIT– III:
Canonical forms, Triangular form, Nilpotent transformations

UNIT– IV:
Canonical forms : Rational canonical form, Trace and Transpose

UNIT– V:
Hermitian, Unitary and Normal Transformations

TEXT BOOK:
Topics in Algebra by I.N. Herstein, Second Edition, John Wiley and Sons, 1999

UNIT I	**:**	Chapter 4: Sections 4.3 to 4.4
UNIT II	**:**	Chapter 6: Sections 6.1 to 6.2
UNIT III	**:**	Chapter 6: Sections 6.4 to 6.5
UNIT IV	**:**	Chapter 6: Sections 6.7 to 6.8
UNIT V	**:**	Chapter 6: Sections 6.10

REFERENCE BOOKS :
1. ***Modern Algebra*** by Vikas Khanna – Vikas Publications
2. ***Modern Algebra (Abstract Algebra)*** by A.R. Vasishtha - Krishna Prakashan Mandir

Mapping of CO with PSO :

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**2**	**-**	**-**	**-**	**-**	**-**
CO2	**-**	**3**	**2**	**-**	**-**	**-**
CO3	**2**	**-**	**-**	**-**	**2**	**1**
CO4	**-**	**-**	**-**	**3**	**-**	**-**
CO5	**-**	**-**	**-**	**-**	**2**	**2**

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER : Prof. E. B. BALARAMAN

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSC22	ANALYSIS – II	CORE – 6	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION :

The aim of the course is to over the basic concepts like Topological concepts of real line, differentiation and integration with applications.

COURSE OBJECTIVE :

To introduce the concept of Riemann-Stieltjes integral, Sequence and series of functions, properties of functions which are represented by Power series.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	define properties of Riemann-Stieltjes integral and differentiation	Upto K5
CO 2	do extensions to complex-valued and vector-valued functions on intervals	Upto K5
CO 3	understand the concept of uniform convergence and continuity	Upto K5
CO 4	learn Equi continuous families of functions and Stone-Weierstrass theorem	Upto K5
CO 5	derive properties of functions by power series.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

ANALYSIS – II

UNIT– I:
Definition and existence of the integral – Properties of integral (Statement only)

UNIT– II:
Change of variable – Integration and differentiation – fundamental theorem of calculus – Integration by parts – Rectifiable curves.

UNIT– III:
Discussion of main problem – Uniform convergence, continuity, integration and differentiation.

UNIT– IV:
Equi continuous families of functions – Stone-Weierstrass theorem.

UNIT– V:
Power series – The exponential and Logarithmic functions – trigonometric functions – completeness of complex field – Parseval's theorem – Gamma function.

TEXT BOOK:
Principles of Mathematical Analysis (3rd edition) by Walter Rudin.
McGraw-Hill International Editions - 1964.

UNIT I: Chapter 6 - 6.1 to 6.18
UNIT II: Chapter 6 - 6.19 to 6.27
UNIT III: Chapter 7 - 7.1 to 7.18
UNIT IV: Chapter 7 - 7.19 to 7.33
UNIT V: Chapter 8 - 8.1 to 8.21

REFERENCE BOOKS:
1. ***Real Analysis – 3rd edition*** – H.L. Roydan – Prentice-Hall of India Pvt. Limited, 1998.
2. ***Mathematical Analysis – 2nd edition*** –Tom M Apostol - Narosa Publishing House, 1985.

Mapping of CO with PSO :

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	-	-	2	-	-	-
CO2	-	3	-	-	-	-
CO3	2	-	-	-	-	-
CO4	-	2	-	3	-	-
CO5	-	-	-	-	-	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: **Dr. T. R. DINAKARAN**

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSC23	DIFFERENTIAL EQUATIONS	CORE – 7	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

In mathematics, a differential equation is an equation that contains one or more function with its derivatives. The derivative of the function define the rate of change of a function at a point, It is mainly used in fields such as physics, biology, engineering etc., This course describes not only the theoretical part of differential equation but also the techniques and for obtaining solutions for various types of ordinary and partial differential equations.

COURSE OBJECTIVES :

- To enable the students to acquire the knowledge about Different differential equations.
- To understand the concept of Initial Value Problem and Its solution
- To study Legendre's , Euler's and Bessel's equation
- To get the knowledge about integral surfaces.
- To know different methods of solving non-linear partial

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	find the solution of homogeneous equation and the Relation between Wronskian and linear independence of the solution of the equation	Upto K5
CO 2	get the knowledge to find the regular singular points of the second order equation and Bessel's equation	Upto K5
CO 3	apply Lipschitz's theorem and find the Lipschitz's constant of the Initial Value Problem	Upto K5
CO 4	understand different methods of solving partial differential equations and find the integral surface passing through the given curve.	Upto K5
CO 5	get the knowledge to identify the compatible system of First order and its solution.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

DIFFERENTIAL EQUATIONS

UNIT– I:

Introduction-IVP for homogeneous equation- solutions of the homogeneous equation – Wronskian and Linear independence- Reduction of the order of a homogeneous equation- the non-homogenous equation – homogeneous equation with analytical coefficient.

UNIT– II:

Legender's equation-Introduction –The Euler equation- 2^{nd} order equation with regular singular points-an example-2^{nd} order equation with regular - Singular points –the general case (results only)-Exceptional cases (results only, theorem statements only)-Bessel equation- Bessel equation (continued).

UNIT– III:

Introduction-equations with variables separated-exact equations-the method of successive approximation-The Lipschitz's condition.

UNIT– IV:

Partial Differential equation- origin of 1^{st} order partial differential equation –Liner equations of the 1^{st} order –Integral surfaces passing through a curve.

UNIT– V:

Non linear partial differential equation of 1^{st} order-compatible system of first order-Charpit's method- special types of 1^{st} order equations.

TEXT BOOKS:

1. ***An Introduction to Ordinary Differential Equations*** by E.A Codington, Prentice Hall of India. 1987
2. ***Elements of Partial Differential Equations*** by I.N. Sneddon, Tata McGraw Hill book Company 1986.

UNIT I : Textbook 1, Chapter3 (sec 1 to 7).
UNIT II : Text book 1, Chapter 3 (sec 8), Chapter 4 (sec 1, 2, 3, 7, 8).
UNIT III : Text book 1, Chapter 5(sec 1, 2, 3, 4, 5).
UNIT IV : Text book 2, Chapter2 (sec2.4, 2.5).
UNIT V : Text book 2, Chapter 2 (sec.2.7, 2.9, 2.10)

REFERENCE BOOK:

Ordinary Differential Equations and Stability Theory by S.G. Deo and V. Raghavendra

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	-	-	-	-	-
CO2	-	3	-	-	-	-
CO3	-	-	-	-	2	1
CO4	-	-	-	3	-	-
CO5	-	-	-	-	-	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. E. B. BALARAMAN

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSC24	NUMERICAL ANALYSIS.	CORE – 8	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION :

Numerical Analysis is the area of Mathematics that creates, analyses and implements algorithms for numerically solving Mathematical problems. It has very broad applications in Mathematics, Physics, engineering, finance and life sciences.

COURSE OBJECTIVE:

To enable the students to acquire the knowledge of numerical analysis.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	list out and discuss various iteration methods based on first degree and second degree equations.	Upto K5
CO 2	compute Eigen values and Eigen vectors of a square matrix and its bounds.	Upto K5
CO 3	acquire the knowledge of interpolation of polynomials.	Upto K5
CO 4	discuss Numerical differentiation and Numerical integration.	Upto K5
CO 5	form difference equations and to discuss Numerical methods.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

NUMERICAL ANALYSIS

UNIT– I:

Iteration methods based on first degree equation; Iteration methods based on second degree equation except multipoint iteration method – Rate of convergence

UNIT–II:

Introduction – Iteration methods before successive over relaxation method, Eigen values and Eigen vectors – Bounds on Eigen values

UNIT– III:

Introduction—Lagrange Interpolation – Hermite interpolation – piecewise and spline interpolation

UNIT– IV:

Introduction – Numerical differentiation – Methods based on Interpolation (Methods based on finite differences and Methods based on undetermined coefficients not included) – Partial Differentiation – Numerical integration (open type integration rules not included), Methods on integration--composite Integration methods--Romberg method

UNIT– V:

Introduction – Difference equations – Numerical methods (Euler's method only)

TEXT BOOK:

Numerical methods for scientific and engineering computation by M.K. Jain, S.R.K, R.K. JAIN, fifth edition, New age international Publishers, 2008.

(Note: Section B of the question paper for the end semester examination will contain only problems, scientific calculator is allowed)

UNIT I	: Chapter 2: sections 2.3 to 2.5
UNIT II	: Chapter-3: section 3.1 before SOR method, 3.4 to 3.6
UNIT III	: Chapter 4: sections 4.1, 4.2(Lagrange method), 4.5, 4.6 (only linear and quadratic interpolation)
UNIT IV	: Chapter 5: Section 5.1, 5.2, 5.5 to 5.7, 5.9, 5.10
UNIT V	: Chapter 6: section 6.1 to 6.3 (Euler's method only).

REFERENCE BOOK :

Introductory Methods of Numerical Analysis by S.S. Sastry, PHI Learning Pvt., Ltd.,

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**-**	**3**	**-**	**-**	**-**
CO2	**-**	**3**	**-**	**-**	**-**	**-**
CO3	**2**	**-**	**3**	**-**	**-**	**-**
CO4	**-**	**3**	**-**	**3**	**-**	**-**
CO5	**-**	**-**	**-**	**-**	**-**	**2**

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. G. R. SHYAMALA

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSE21	ADVANCED MECHANICS	ELECTIVE – 3	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	Skill Oriented	Entrepreneurship
	✓	✓	

COURCE DESCRIBCTION:

This course deals with basics laws ,various technique and principles of Mechanics. This course is designed to explain various concepts used to learn Classical Mechanics.

COURCE OBJECTIVES:

- To introduce the basic laws.
- To explain various techniques used to solve problems.
- To define Hamilton's principle.
- To discuss the classification of orbits.
- To list Keplers problem.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	list out different types constraints with examples	Upto K5
CO 2	illustrate various principle and apply calculus of variation techniques to solve problems.	Upto K5
CO 3	derive Lagrange equation..	Upto K5
CO 4	apply viral theorem to derive special cases.	Upto K5
CO 5	recognize and solve problem based on power law potential.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

ADVANCED MECHANICS

UNIT – I:
Mechanics of a particle – Mechanics of a system of particles – Constraints.

UNIT – II:
D'Alembert's principle – Lagrange's equation – Velocity dependent potentials – the Dissipation function – Hamilton's principle – some techniques of calculus of variations

UNIT – III:
Derivation of Lagrange's equation from Hamilton principle – Extension of Hamilton's principle to Non - Holonomic system.

UNIT – IV:
Reduction to an equivalent on body problem – the equation of motion and first integral – equivalent one dimensional problem – classification of orbit- the viral theorem.

UNIT – V:
The differential equation for the orbit and integrable power law potentials – The Kepler problem- Inverse square law of force – The motion in time in Kepler problem – The Laplace –Runge – Lenz vector

TEXT BOOK:
Classical Mechanics by H. Goldstein, Second edition, Addison Wesly, New York, 1980.

UNIT I : Chapter 1 (Sec 1.1 – 1.3)
UNIT II : Chapter 1 (Sec 1.4, 1.5) Chapter 2 (Sec 2.2,2.2)

UNIT III : Chapter 2 (Sec 2.3, 2.4)
UNIT IV : Chapter 3 (Sec3.1 – 3.4)
UNIT V : Chapter 3 (Sec 3.5, 3.7 – 3.9)

REFERENCE BOOK:
Classical Mechanics by UBADYAYA –Himalaya publishing House (2019), New Delhi.

Mapping of CO with PSO :

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	-	-	-	-	-
CO2	-	3	-	-	-	-
CO3	-	-	-	-	2	1
CO4	-	-	-	3	-	-
CO5	-	-	-	-	-	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: **Prof. M. K. ESWARLAL**

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSE22	FUZZY SETS AND THEIR APPLICATIONS	ELECTIVE – 4	6	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION :

To master the various fundamental concept of fuzzy logic and fuzzy sets. This will help the students to get sufficient knowledge to analyze and design the various intelligent control system.

COURSE OBJECTIVES :

- To enable the students to acquire the knowledge of fuzzy logic .
- To understand the concepts of fuzzy numbers, fuzzy relations and fuzzy applications in science and engineering.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	list out different types operations with examples	Upto K5
CO 2	illustrate various arithmetic operations on intervals and fuzzy numbers	Upto K5
CO 3	list out various fuzzy relations	Upto K5
CO 4	list out various fuzzy propositions.	Upto K5
CO 5	recognize applications of fuzzy theory in various fields.	Upto K5

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

FUZZY SETS AND THEIR APPLICATIONS

UNIT – I:

Fuzzy sets – Basic types – Fuzzy sets – Basic concepts – Additional properties of α – cuts – Representation of fuzzy sets – Extension principle for fuzzy sets – Types of operations – fuzzy complements

UNIT – II:

Fuzzy numbers – Linguistic variables – arithmetic operations on intervals – arithmetic operation on fuzzy number

UNIT – III:

Crisp versus fuzzy relations – projections and cylindric extensions –Binary fuzzy relations on a single set – Fuzzy equivalence relations – Fuzzy compatibility relations – Fuzzy ordering relations

UNIT – IV:

Classical logic – An over view - multivalued logic – Fuzzy propositions – Fuzzy quantifiers – Linguistic Hedges – Inference from conditional fuzzy propositions – inference from conditional and quantified propositions – Inference from quantified propositions

UNIT – V:

Introduction – Civil Engineering – Computer Engineering- Reliability theory – Medicine – Fuzzy Regressions – Interpersonal Communications.

TEXT BOOK:

Fuzzy sets and Fuzzy logic – Theory and applications – Second edition, by George J. Klir and B. Yuan. Publisher – Prentic Hall; US edition – 1995

UNIT I: Chapter 1 Section 1.2 to 1.4; Chapter Sections 2.1 to 2.3; Chapter 3 Sections 3.1 to 3.2
UNIT II: Chapter 4: Sections 4.1 to 4.4
UNIT III: Chapter 5 Sections 5.1 to 5.7
UNIT IV: Chapter 8 full
UNIT V: Chapter 16; Sections 16.1, 16.2, 16.5 to 16.7; Chapter 17 Sections 17.1 to 17.3 and Sections 17.5 , 17.6

(All units are from the text books)

REFERENCE BOOK:

Fuzzy Set Theory by Zimmermann – Springer Science – Business India

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	2	-	-	-
CO2	-	3	-	-	-	-
CO3	2	-	3	-	-	-
CO4	-	2	-	3	-	-
CO5	-	-	-	-	-	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: **Prof. N.H.SARAVANAN**

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSE23	VISUAL BASIC	ELECTIVE – 5	4	-	3

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	Skill Oriented	Entrepreneurship
	✓	✓	✓

COURSE DESCRIPTION :

This is an introductory course dealing with the concepts of object oriented computer programming of windows applications. This course is offered in a lecture / lab format. Students will develop solutions and create programmes to solve business problem

COURSE OBJECTIVE:

To enable the students to understand the concepts of variables, loops, functions, arrays, fundamentals of graphics, file handling and to apply the knowledge gained in writing programs.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the concept of tool box, message box, input box, variables, data types and constants.	**Upto K5**
CO 2	gain knowledge about displaying information, controlling program flow and built-in functions.	**Upto K5**
CO 3	understand arrays, control arrays and common dialogue boxes.	**Upto K5**
CO 4	analyze mouse activities and file handling.	**Upto K5**
CO 5	gain knowledge about overview of COM/OLE and SQL base and database objects and understands the related topics.	**Upto K5**

K1 – KNOWLEDGE (REMEMBERING), K2 – UNDERSTAND, K3 – APPLY
K4 – ANALYSE, K5 – EVALUATE

VISUAL BASIC

UNIT – I:

Customizing a form and writing simple programs: Starting a new project-the properties window-common form properties-scale properties-color properties-making a form responsive. First step in building the user interface: The tool box-creating controls-the name property-properties of command buttons-simple event procedures for command buttons-access keys-image controls-text boxes-labels-navigating between controls-message boxes.

First step in programming: Variables-setting properties with code-data types-constants-input boxes.

UNIT – II:

Displaying information: Displaying information on a form-the format function-picture boxes- rich text boxes-the printer object. Controlling program flow: Determine loops-indeterminate loops-making decision –select case-nested if-then-the goto. Built-in functions: String functions-numeric functions-date and time functions. Writing your own functions and procedures: Function procedures-sub procedures.

UNIT – III:

Organizing information via code: Lists: one dimensional arrays-fixed versus dynamic arrays-static arrays-the erase statement. Organizing information via controls: control arrays-list and combo boxes-the flex grid control-Finishing the interface: the toolbox revisited frames-timers-option buttons-check boxes-scroll bars-common dialog boxes-the the Microsoft windows common controls-menus-MDI forms.

UNIT – IV:

An introduction to graphics: Fundamentals of graphics-screen scales-the line and shape controls-graphics via code-line and boxes-circles-ellipse and pie chart.

Monitoring mouse activity: The mouse event procedures-dragging and dropping operations for controls. Basic file handling: File commands-sequential file-random access files-binary files-sharing files. File system controls and file system objectives: File system controls.

UNIT – V:

Communicating with other windows applications: Overview of COM/OLE using the OLE client control at design time – OLE automation – OLE drag and drop. Survey of database development using VB: Using the data control – SQL base-database objects – useful method and events for the data control.

TEXT BOOK:

Visual Basic 6 from ground up by Gary Comell (2010), Tata Mc Graw-hill Pearson Education, Asia, 2002.

REFERENCE BOOKS:

1. ***Visual Basic Programming*** by Dr. A Murugan, Dr. K. Shyamala & Grasha Jacab – Margham Publications.
2. ***Visual Basic 6 Programming*** by Content Development, McGraw Hill Publication

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	2	-	-	-
CO2	-	3	-	-	-	-
CO3	2	-	3	-	-	-
CO4	-	2	-	3	-	-
CO5	-	-	-	-	-	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. N.H. SARAVANAN

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24PMSEP1	VISUAL BASIC LAB	ELECTIVE – 5 LAB	-	2	1

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION :

This is an introductory course dealing with the concepts of object oriented computer programming of windows applications. This course is offered in a lecture / lab format. Students will develop solutions and create programmes to solve business problem

COURSE OBJECTIVE:

To enable the students to understand the concepts of variables, loops, functions, arrays, fundamentals of graphics, file handling and to apply the knowledge gained in writing programs.

VISUAL BASIC LAB

AREA OF PROGRAM:

1. Simple programs using text box, label and command button.
2. Implementation of string and data function
3. Programs using input box, message box
4. Design of a calculator
5. Design of font style
6. Design of text editor
7. Animation using timer control
8. Screen saver program
9. Pop up menu creation
10. Dynamic loading of controls
11. Program using OLE
12. Programs using data control.
13. Designing a calendar

COURSE DESIGNER: **Prof. N. H. SARAVANAN**