SEMESTER: I PART: OPEN ELECTIVE-1	COURSE CODE:22PMATO16-1 COURSE TITLE: BASIC MATHEMATICS	CREDIT: 3 HOURS: 3

COURSE OBJECTIVES

The objectives of the course are to know about the concepts of matrices and its applications, Ordinary and Partial Differential Equations, Laplace Transforms and Fourier Series.

Unit I: Matrices Hours: 9

Matrices – Simultaneous Linear equations– Cayley-Hamilton Theorem – Eigen values and Eigen vectors

Chapter 3 – Sections: 3.1 to 3.4 of Text Book 1

Unit II: Differential Equations Hours: 9

Equations of first order higher degree – Linear equations of higher Order – Homogeneous linear equations.

Chapter 6: Sections: 6.1 to 6.3 of Text Book 1

Unit III: Partial Differential Equations Hours: 9

Formation of Partial Differential Equations - First Order Partial Differential Equations – Some Standard forms – Lagrange's form.

Chapter 8: Sections: 8.1 to 8.4 of Text Book 1

Unit IV: Laplace transforms Hours: 9

Laplace transform – Inverse Laplace transform – Solution of Differential Equations using Laplace Transform.

Chapter 7: Section 7.1 – 7.3 of Text Book 1

Unit V: Fourier Series Hours: 9

Fourier Expansion – Fourier Co-efficients – Fourier series for Odd and Even Functions – Half Range Fourier Series.

Chapter 43 of Text Book 2

COURSE OUTCOME

After the successful completion of this course, the students will be able to:

1) Understanding about matrices and its applications.
2) Acquire the knowledge about the Differential Equations.
3) Formulate and solve the partial differential equations
4) Apply the results on Laplace transform and solution of Differential Equations using Laplace Transform.
5) Acquire the techniques of Fourier series.

Text Books

1) S. Arumugam and A. Thangapandi Isaac, Mathematics for Physical Sciences-Volume II, New Gamma Publishing House, Palayamkottai, 2000.
2) P.R. Vittal, Mathematical Foundations, Margham Publications, Chennai,2003.

Supplementary Readings

1) P. Balasubramaniyam, K. G. Subramanian, Ancillary Mathematics, Volume – I, Tata McGraw – Hill publishing company limited, New Delhi, 1996.
2) G. Britto Antony Xavier, V. Balaji, S.U. Vasantha Kumar, B. Govindan, Mathematical Sciences, Jayalakshmi Publications, 2-e, 2015.
3) P. DuraiPandian, S. UdayaBaskaran, Allied Mathematics, Volume – I, Muhil publishers, 1st Edition, Chennai, 1997.
4) P.Kandsamy and K. Thilagavathy, Allied Mathematics volume – I, Volume – II, S. Chand & Company, New Delhi, 2004.
5) Shanti Narayan, P.K.Mittal, Differential Calculus, S.Chand& Co, New Delhi, 2005. 5. A.Singaravelu, Allied Mathematics, Meenakshi Agency, Chennai, 2001.
6) P.R.Vittal, Allied Mathematics, Margham Publications, Chennai, 1999.

OUTCOME MAPPING

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3
CO2	3	3	3	3	2
CO3	2	3	3	3	3
CO4	3	2	3	3	3
CO5	2	3	3	3	2

SEMESTER: I PART: OPEN ELECTIVE- 2	COURSE CODE:22PMATO16-2 COURSE TITLE:MATHEMATICAL FOUNDATIONS	CREDIT:3 HOURS: 3

COURSE OBJECTIVES

1) To learn how to apply fundamental mathematical tools and techniques used in most
2) fields of science and mathematics
3) To learn the different types of functions and operators
4) To learn the conditional and bi conditional statements ,conjunction and disjunction
5) To learn the concepts of lattices and Boolean Algebra
6) To know the different kinds of Interpolation.

Unit I : **Hours: 9**

Relations – Equivalence Relation – Functions and Operators – One-to-one, Onto Functions –Special Types of Functions – Invertible Functions – Composition of Function – Mathematical Induction.

Unit II: **Hours: 9**

Logic: Introduction – TF – Statements – Connectives – Conjunction – Disjunction – Negation – Conditional Statements – Bi conditional Statements – The Truth Table of a Formula – Tautology.

Unit III: **Hours: 9**

Lattices – Some Properties of Lattices - New Lattices – Lattice Homomorphism's – Product Lattices of Two Lattices– Modular and Distributive Lattices – Boolean Algebra.

Unit IV: **Hours: 9**

Iterative Methods: Birge – Vieta – Graeffe's Root squaring methods - System of linear algebraic equations: Gauss Elimination, Jacobi iteration method - Gauss-Seidel iteration method.

Unit V: **Hours: 9**

Interpolation: Lagrange interpolation – Newton's Forward Difference Interpolation–Newton's Backward Difference Interpolation – Trapezoidal Rule - Simpson Rule - Romberg integration.

COURSE OUTCOMES

1) Students will be able to have knowledge of relations, functions, mathematical logic, lattices and numerical methods.
2) Understand the types of functions, conditional statements and tautology in Mathematical logic, properties of lattices, Boolean algebra, numerical techniques to find the roots and interpolation methods.

3) Apply mathematical induction, composition of functions, logical notation to write an argument, suitable method to solve linear equations and numerical integration, interpolation.
4) Analyze various types of function, statements using truth tables, use Boolean algebra to design and simplify logic circuits, numerical methods to find solutions of linear equations and system of equations using different methods.
5) Justify relations and functions, to construct mathematical arguments using logical connectives and quantifiers, lattices. Evaluate solutions of system of linear equations and numerical integration .

Text Books (In API Style)

1. Dr. M.K. Venkataraman, Dr. N. Sridharan, N. Chandrasekaran., Discrete Mathematics, The National

Publishing Company, Chennai. 2006.

Unit-I Chapter II (Sec 2, 5), Chapter III (Sec 1, 2, 3, 4, 5), Chapter IV (Sec 2) (Theorems are excluded).

Unit-II Chapter IX (Sec 1, 2, 3, 6, 7)

Unit-III Chapter X (Sec 1, 2, 3, 4, 5) (Definition and example only for Sec 5)

2. M.K. Jain, S.R.K. Iyengar, R.K. Jain., Numerical Methods for Scientific and Engineering

Computation, 4th Edition, New Age International (P) Limited, Publishers, 2003.

Unit-IV Chapter 2 (Sec 2.9,), Chapter 3 (Sec 3.2, 3.4).

Unit-V Chapter 4 (Sec 4.2, 4.4), Chapter 5 (Sec 5.9, 5.10).

Supplementary Readings

1) J.P. Trumblay, R. Manohar. Discrete Mathematical Structures with Applications to Computer Sciences, McGraw-Hill International Edition, 1987.
2) S.S. Sastry, Introductory Methods of Numerical Analysis, PHI Learning Private Limited, 4th Edition, New Delhi 2009
3) P. Kandasamy, K.Thilagavathy, K.Gunavathi, Numerical Methods, S. Chand & Company Ltd-2008.

OUTCOME MAPPING

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	2	2	3	3	3
CO4	3	3	3	2	3
CO5	2	3	3	3	2

SEMESTER: I PART: OPEN ELECTIVE - 3	COURSE CODE: 22PMATO16-3 COURSE TITLE: LaTeX	CREDITS: 3 HOURS: 3

COURSE OBJECTIVES

The main objectives of this course are to:

1) Introduce the Software knowledge in Latex
2) Learn Mathematics structures using Latex
3) Understanding the basic concepts and their properties are important for the development of the present and further courses.

UNIT – I **Hours: 9**

Text formatting – TEX and its offspring.

UNIT – II **Hours: 9**

What's different in LaTeX2∈ – Distinguishing LaTeX 2∈ – Basic of a LaTeX file.

UNIT – III **Hours: 9**

Commands and Environments – Command names and arguments – Declarations – Lengths – Special Characters.

UNIT – IV **Hours: 9**

Document layout and Organization – Document class – Page style Parts of the Document.

UNIT – V **Hours: 9**

Table of Contents – Fine tuning text – Footnotes and marginal notes.

Text Books

1) H. Kopka and P.W. Daly, A guide to Latex, 3rd Edition, Addison – Wesley, London, 1999.
2) Stefan Kottwitz,LaTeX Beginner's Guide: Create High Quality and Professional Looking Texts, Articles and Books for Business and Science Using Latex, Packt Publishing, 2011.

COURSE OUTCOMES

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

1) Remember to Download and install open course software LaTeX
2) Understanding and formatting LaTeX
3) Illustrate to learn to create Latex file
4) Apply and Analyze the LaTeX commands to large files
5) Able to learn mathematics derivations and structures using LaTeX.

OUTCOME MAPPING

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	2	3	2
CO3	3	2	3	3	3
CO4	3	3	3	2	3
CO5	2	3	3	3	2