

20PEB102					MATHEMATICS-I					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hours/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	0	4	4	25	50	25	-	-	100

COURSE OBJECTIVES

- To be able to analyse complex functions.
- To be able to formulate and solve various engineering problems.
- To understand the basic concepts of matrix and its application.
- To study the complex equations and apply them to solve complex functions.

Unit I

Hours: 10

Systems of Linear Equations and Matrices: Matrix, Some Definitions Associated with Matrices Systems of Linear Equations, Matrices and Elementary Row Operations, The Inverse of a Square Matrix, Matrix Equations, Rank of the Matrix, Applications of Systems of Linear Equations.

Linear Transformation: Linear Transformations, Composition of Linear transformation The Null Space and Range, Isomorphism, Inverse Linear Transformation, Matrix Representation of Linear Transformations, Similarity.

Eigen Value and Eigen Vectors: Eigen value and Eigen Vectors, Diagonalization, Cayley-Hamilton Theorem, Quadratic Form.

Unit II

Hours: 10

Vector Spaces: Euclidean Vector Space, Vector Spaces, Subspaces, Linear Combination, Span, Linear Dependence and Independence, Basis, Finite Dimensional Vector Space, Basis and Dimension for Solution Space of the Homogeneous Systems, Reduction and Extension of Basis, Coordinate Vector Relative to Basis, Change of Basis, Row Space, Column Space and Null Space, Rank and Nullity

Unit III

Hours: 09

Inner Product Spaces: Introduction, The Dot Product on R^n and Inner Product Spaces, Orthogonal Basis Orthonormal Bases, Gram-Schmidt Process, Orthogonal Complements, Application: Least Squares Approximation, Orthogonal Projection Diagonalization of Symmetric Matrices, Application: Quadratic Forms

Unit IV

Hours: 10

Complex Analysis: Complex numbers, Exponential, Trigonometric, De Moiré's Theorem, Roots of a complex number Function of a Complex variable, Analytic function, Cauchy Riemann equations, Laplace Equation, Harmonic Functions, Harmonic Conjugate functions and their Engineering Applications Conformal mapping and its type, Some standard & special conformal mappings, Definition of a Complex line integral, Cauchy's integral theorem, Cauchy's Integral formula, Residue theorem, Calculation of residues, Evaluation of real definite integrals.

MAX <40 Hrs>

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1- Demonstrate an understanding of matrix and calculus
- CO2- Apply the techniques of matrix to evaluate large amount of variables.
- CO3- Derive various technique to analyse complex function.
- CO4- Apply Theorems to solve complex functions.
- CO5- Analyze and evaluate the different structure and process using vector.
- CO6- Create an interest to solve various real-world problems with physical significance.

TEXT / REFERENCE BOOKS

1. Higher Engineering Mathematics, by B. S Grewal, Khanna Publication, Delhi
2. Higher Engineering Mathematics Vol. 1 by Dr. K.R.Kachot, Mahajan Publishing House
3. Higher Engineering Mathematics Vol. 2 by Dr. K.R.Kachot, Mahajan Publishing House
4. Complex Variables and Applications, by R. V. Churchill and J. W. Brown (7th Edition), McGraw-Hill.
5. Complex Analysis, by J. M. Howie, Springer-Verlag (2004)
6. Complex Variables-Introduction and Applications, by M. J. Ablowitz and A.S. Fokas, Cambridge University Press, 1998 (Indian Edition).
7. Introduction to Linear Algebra with Application, by Jim Defranza, Daniel Gagliardi, Tata McGraw-Hill
8. Elementary Linear Algebra, Applications version, by Anton and Rorres, Wiley India Edition.
9. Advanced Engineering Mathematics, by Erwin Kreysig, Wiley Publication.
10. Elementary Linear Algebra, by Ron Larson, Cengage Learning.
11. Calculus, Volumes 2, by T. M. Apostol, Wiley Eastern.
12. Linear Algebra and its Applications, by David C. Lay, Pearson Education

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 10 Questions of 2 marks each-No choice

20 Marks

PART B: 2 Questions from each unit with internal choice, each carrying 16 marks

80 Marks