RMA2A001 Mathematics-II 3-0-0

OBJECTIVE:

The objective of the course Mathematics-II is to familiarize the prospective engineers with techniques in Matrix algebra, Vector differential calculus, Vector integral calculus, Fourier series, Fourier transform, Fourier integral. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

Module-1 (8 hrs.)

Matrix Algebra, Solution of system of linear equations (Gauss Elimination), Rank and Inverse of matrices (Gauss-Jordan), Examples of Vector Spaces.

Module-2 (8 hrs.)

Eigen values and eigen vectors, Symmetric and skew-symmetric matrices, Orthogonal matrices, Complex matrices, Hermitian and skew matrices, Unitary matrices and similarity of matrices, Diagonalisation of Matrices

Module-3 (9hrs.)

Vector differential calculus: vector and scalar functions and fields, Derivatives, Curves, tangents and arc Length, gradient, divergence, curl

Module-4 (10 hrs.)

Vector integral calculus: Line Integrals, Green Theorem, Surfaceintegrals, Gauss theorem and Stokes Theorem (Without Proof)

Module – 5 (10 hrs.)

Fourier series, Fourier expansion of functions of any period, Even and odd functions, Half range Expansion, Fourier transform and Fourier Integral.

OUTCOMES

On completion of this course, student are able to :

- Apply the knowledge of matrix algebra for solving system of linearequations and compute the inverse of matrices.
- To develop the essential tool of matrices to compute eigen values and eigen vectors required for matrix diagonalization process.
- Illustrate the concept of vector differential calculus to understand the solenoidal and irrotational vectors
- Illustrate the concept of vector integral calculus and exhibit the inter dependence of line, surface and volume integrals.
- Know the use of periodic functions and Fourier series, Fourier intergral, Fourier transform to analyze circuit and system communication.

Text Book:

1. Advanced Engineering Mathematics by E. Kreyszig, Tenth Edition,Willey

References:

2. Higher Engineering Mathematics by B.V. Raman, , McGraw Hills Education

3. Engineering Mathematics by P. S. Das & C. Vijayakumari, Pearson.

4. Advance Engineering Mathematics by P.V.O'NEIL, CENGAGE.