PRASAD V POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY (AUTONOMOUS) **Regulation- PVP14 Common to all branches** I B. Tech / II Semester **Engineering Mathematics – II** Credits: 3

Course Code(s): CE2T1, ME2T1, CS2T1, IT2T1, AE2T1, EE2T1, EC2T1

Lecture: 3 periods/week Tutorial: 1 period /week

Internal assessment: 30 marks Semester end examination: 70 marks

COURSE OBJECTIVES:

After completion of this course engineers will be able to apply the concepts of matrices, Laplace transforms, Fourier series, Fourier transforms.

COURSE OUTCOMES:

At the end of the course student will be able to

- 1. Solve linear system of equations.
- 2. Determine the eigen values and eigen vectors of given square matrix and able to find inverse, power of a matrix using Cayley-Hamilton theorem.
- **3.** Find Laplace transforms, inverse Laplace transforms of the given functions and able to apply Laplace transforms to solve differential equations with initial conditions.
- 4. Write given function in terms of sine and cosine terms in Fourier series and also to get knowledge in Fourier transforms.
- 5. Solve finite difference equations using Z-transforms.

UNIT – I

Matrices and Linear systems of equations: Rank-Echelon form, Normal form - Solution of Linear System of equations - Direct Methods- Gauss Elimination - Gauss Jordon and Gauss Seidal Methods.

UNIT – II

Eigen values - Eigen vectors: Eigen values - Eigen vectors - Properties - Cayley-Hamilton Theorem -Inverse and powers of a matrix by using Cayley-Hamilton theorem.

UNIT – III

Laplace transforms and Inverse Laplace transforms:

Laplace transforms: Laplace transforms of standard functions -Shifting Theorems, Transforms of derivatives and integrals - Unit step function -Dirac's delta function.

Inverse Laplace transforms: Convolution theorem - Application of Laplace transforms to ordinary differential equations Partial fractions.

UNIT – IV

Fourier Series and Fourier transforms:

Fourier series: Determination of Fourier coefficients - Fourier series - even and odd functions - Fourier series in an arbitrary interval-Half-range sine and cosine series.

Fourier transforms: Fourier integral theorem (only statement) - Fourier sine and cosine integrals -Fourier transform - sine and cosine transforms - properties - inverse transforms - Finite Fourier transforms.

UNIT - V

Z-transform - properties - Damping rule - Shifting rule - Initial and final value theorems -Inverse Z-transform - Convolution theorem – Solution of difference equation by z-transforms.

Text Books

- 1. Higher Engineering Mathematics Khanna Publishers B.S. Grewal 42nd Edition.
- 2. Advanced Engineering Mathematics Wiley Erwin Kreyszig- 8th Edition.
- 2. Engineering Mathematics Vol-II, Iyengar, T.K.V, Krishna Gandhi, et.al S.Chand Co. New Delhi.