

**(Syllabus for BE III Sem. CS/IT/EC Branches )**

**COURSE OBJECTIVE-** The objective of this course is to fulfill the needs of Engineers to understand the Applications of Fourier Series, Fourier & Laplace Transforms and Statistical Techniques in order to acquire Mathematical knowledge and to Solving a wide range of Practical Problems Appearing in the CS/IT/EC discipline of Engineering.

**Course Contents**

**Fourier Series:** Fourier Series for Continuous & Discontinuous Functions, Expansion of odd and even periodic functions, Half-range Fourier series, Complex form of Fourier Series.

**Integral Transforms:**

**Fourier Transform:** Complex Fourier Transform, Fourier Sine and Cosine Transforms, Applications of Fourier Transform in Solving the Ordinary Differential Equation.

**Laplace Transform:** Introduction of Laplace Transform, Laplace Transform of elementary Functions, Properties of Laplace Transform, Change of Scale Property, First and Second Shifting Properties, Laplace Transform of Derivatives and Integrals. Inverse Laplace Transform & its Properties, Convolution theorem, Applications of Laplace Transform in solving the Ordinary Differential Equations.

**Random Variables:** Discrete and Continuous Random Variables, Probability Function, Distribution Function, Density Function, Probability Distributions, Mean and Variance of Random Variables.

**Distribution:** Discrete Distributions- Binomial & Poisson Distributions with their Constants, Moment Generating Functions, Continuous Distribution- Normal Distribution, Properties, Constants, Moments.  
Curve Fitting using Least Square Method.

**COURSE OUTCOMES-** The curriculum of the Department is designed to satisfy the diverse needs of students. Coursework is designed to provide students the opportunity to learn key concept of Applications of Fourier Series, Fourier & Laplace Transforms and Statistical Techniques.

**EVALUATION-** Evaluation will be continuous, an integral part of the class as well as through external assessment.

**Reference:**

1. Probability & Statistics by G Shanker Rao, University Press.
2. Mathematical Statistics by George R., Springer
3. Erwin Kreyszig: Advanced Engineering Mathematics, Wiley India.
4. H C Taneja: Advanced Engineering Mathematics, I.K. International Publishing House Pvt. Ltd.
5. S S Sastri: Engineering Mathematics, PHI
6. Ramana, B.V.: Advance Engg. Mathematics, TMH New Delhi
7. Engineering Mathematics By Samnta Pal and Bhutia, Oxford Publication
8. Probability and Statistics in Engineering, W.W. Hines et. al., Wiley India PVT Ltd.

**(Syllabus for BE III Sem. EX/EE/EI/BM Branches)**

**COURSE OBJECTIVE-** The objective of this course is to fulfill the needs of Engineers to understand the Applications of Fourier Series, Different Transforms, Complex Analysis & Vector Calculus in order to enable young technocrats to acquire Mathematical thinking of Formulating, Analyzing and Solving a wide range of Practical Problems Appearing in Science & EX/EE/EI/BM Engineering.

**Course Contents**

**Fourier Series:** Fourier Series for Continuous & Discontinuous Functions, Expansion of odd and even periodic functions, Half range Fourier series, Complex form of Fourier Series.

**Integral Transforms:**

**Fourier Transform-**Complex Fourier Transform, Fourier Sine and Cosine Transforms, Applications of Fourier Transform in Solving the Ordinary Differential Equation.

**Laplace Transform-** Introduction of Laplace Transform, Laplace Transform of elementary Functions, Properties of Laplace Transform, Change of Scale Property, First and Second Shifting Properties, Laplace Transform of Derivatives and Integrals. Inverse Laplace Transform & its Properties, Convolution theorem, Applications of Laplace Transform in solving the Ordinary Differential Equations.

**Functions of Complex Variables:** Analytic functions, Harmonic Conjugate, Cauchy-Riemann Equations, Line Integral, Cauchy's Theorem, Cauchy's Integral Formula, Singular Points, Poles & Residues, Residue Theorem, Application of Residues theorem for Evaluation of Real Integrals.

**Vector Calculus:** Differentiation of Vectors, Scalar and Vector Point functions, Gradient, Directional derivative, Divergence and Curl. Line Integral, Surface Integral and Volume Integral, Stoke's Theorem and Gauss divergence theorem.

**COURSE OUTCOMES-** The curriculum of the Department is designed to satisfy the diverse needs of students. Coursework is designed to provide students the opportunity to learn key concepts of Fourier Series, Different Transforms, Complex Analysis & Vector Calculus.

**EVALUATION-** Evaluation will be continuous, an integral part of the class as well as through external assessment.

**References:**

1. Erwin Kreyszig: Advanced Engineering Mathematics, Wiley India.
2. H C Taneja: Advanced Engineering Mathematics, I.K. International Publishing House Pvt. Ltd.
3. C B Gupta & S R Singh : Engineering Mathematics, Mc Graw Hill Education.
4. S S Sastri: Engineering Mathematics, PHI
5. Ramana: Advance Engg. Mathematics, TMH New Delhi
6. Engineering Mathematics By Samnta Pal and Bhutia, Oxford Publication