JIS College of Engineering

(NAAC 'A' Accredited Autonomous Institution)

Syllabus for B. Tech (CIVIL ENGINEERING)
2ND YEAR 4TH SEM

Paper Name: Mathematics-III
Paper Code: M (CE) 401
Contact: 3L+1T
Credits: 4

Course contents

Fourier Series: Introduction, Periodic functions, Even and odd functions, Special waveforms, Euler's formulae for Fourier's coefficients, Dirichlet's conditions and sum of the Fourier series, Half range Fourier series, Parseval's identity (Statement only).   4L

Fourier Transform: Fourier Transform and its properties, Inverse Fourier Transform (Statement only), Fourier Transform of derivatives (Statement only), Convolution theorem (Statement only). Related problems.   4L

Calculus of Complex variable: Functions, Limit and Continuity, Analytic functions, Cauchy-Riemann equations (Statement only) and related problems, Analytic continuation, Complex integration and Cauchy's theorem (Statement only), Cauchy's integral formula (Statement only), Taylors and Laurent series, Zeros of an analytic function, Poles, Essential singularities, Residue theorem (Statement only) and its application to evaluation of definite integrals (Elementary cases only), Introduction to Conformal Mapping.   10L

Probability: Axiomatic definition of probability, Conditional probability, Independent events, Related problems, Baye's theorem (Statement only) & its application. One dimensional random variable, Probability distributions - discrete and continuous, Expectation, Binomial, Poisson, Uniform, Exponential and Normal distribution, Problems on Binomial, Poisson and Normal distribution only.   10L

Partial Differential Equations: Solution of one dimensional wave equation, One dimensional heat-conduction equation, Laplace equation in two dimension by the methods of 1: Separation of variables 2:Integral Transforms (Laplace and Fourier Transforms).   6L

Series solution of Ordinary Differential equation: Introduction, validity of series solution of an ordinary differential equation, general method to solve equation of the type:
$P_0(x)y'' + P_1(x)y' + P_2(x)y = 0$, related problems, Bessel's equation, properties of Bessel's function, Recurrence formula for Bessel's function of first kind, Legendre's equation, Legendre function; Recurrence formula for Legendre function ($P_n(x)$); Orthogonality relation.   6L