Sardar Vallabhbhai Patel Institute of Technology, Vasad

B. E. Semester III (All Branches)

Advanced Engineering Mathematics - 2130002

Syllabus for Mid Semester Exam 2017-18

Ordinary Differential Equations and Applications:

 First order differential equations: basic concepts, Geometric meaning of y' = f(x,y) Direction fields, Exact differential equations, Integrating factor, Linear differential equations, Bernoulli equations, Modeling , Orthogonal trajectories of curves.Linear differential equations of second and higher order: Homogeneous linear differential equations of second order, Modeling: Free Oscillations, Euler- Cauchy Equations, Wronskian, Non homogeneous equations, Solution by undetermined coefficients, Solution by variation of parameters, Modeling: free Oscillations resonance and Electric circuits, Higher order linear differential equations, Higher order homogeneous with constant coefficient, Higher order non homogeneous equations. Solution by [1/f(D)] r(x) method for finding particular integral.

Laplace Transforms and Applications:

Definition of the Laplace transform, Inverse Laplace transform, Linearity, Shifting theorem, Transforms of derivatives and integrals Differential equations, Unit step function Second shifting theorem,
Dirac's delta function, Differentiation and integration of transforms, Convolution and integral equations, Partial fraction differential equations, Systems of differential equations

Fourier Series and Fourier integral:

Periodic function, Trigonometric series, Fourier series, Functions of any period, Even and odd functions, Half-range Expansion, Forced oscillations, Fourier integral

Power Series:

Basic concept of Power Series, Classification of Singularities and its examples, Power series solution at ordinary point