HSBS2001 MATHEMATICS-III (3-0-0)

Module 1: Laplace Transforms (8 Hours)
Laplace transforms, inverse transforms, linearity, shifting, transforms of derivatives and integrals, solution of ODEs, unit step function, Dirac's delta function, differentiation and integration of transforms, convolution, integral equations.

Module 2: Fourier series & Applied PDE's (8 Hours)
Fourier series: Euler's formula, 2π and arbitrary periodic functions, even and odd functions.
Elementary PDE's: Method of separation of variables (simple problems). One dimensional wave equation: solution by separation of variables, One dimensional heat equation: solution by Fourier series.

Module 3: Basic Probability (8 Hours)
Axiomatic definition of probability, Basic properties, conditioning and independence, Random variables (discrete and continuous), probability mass and density functions, cumulative distribution functions, moments of random variables, mean and variance.

Module 4: Probability Distributions (8 Hours)
Discrete Probability distributions: Binomial, Poisson and hyper-geometric distributions. Continuous Probability distributions: exponential, uniform and normal distributions.

Module 5: Applied Statistics (8 Hours)
Random sampling, estimation of parameters, maximum likelihood estimation, confidence intervals. Regression and correlation analysis: fitting of straight lines (method of lest squares), correlation coefficientwith basic properties.

Text Books:
1. Advanced Engineering Mathematics by E. Kreyszig, John Willey & Sons Inc. 10th Edition.
2. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers & Keying Ye, "Probability & Statistics for Engineers & Scientists", Eighth Edition, 2007, Pearson Education Inc., New Delhi.

Reference Books:
1. Ordinary and Partial Differential equations by J. Sinha Roy and S. Padhy, Kalyani Publishers.
2. Higher Engineering Mathematics by B. V. Ramana, McGraw Hill Education.
3. Engineering Mathematics by Pal and S. Bhunia, Oxford Publication.
   Stochastic Processes, 2nd Edition by Roy D. Yates, Rutgers and David J. Goodman, John Wiley and Sons, INC.