BSCM1210   Mathematics — IV

Module-I   (20 hours)
Numerical Methods:
Approximation and round of errors, Truncation error and Taylor's series
Roots of equation: The bisection method, the false-position method, fixed point iteration, the Newton-Raphson method, Muller's method
Linear algebraic equation: LU decomposition, the matrix inverse, Gauss-Seidel method
Interpolation: Newton divided difference interpolation, Lagrange Interpolation, Newton's forward and backward interpolation.
Numerical integration: The trapezoidal rule, The Simpson's rules, Gauss quadrature
Ordinary differential equation: Euler's method, Improvement of Euler's method, Runge-Kutta methods

Module-II   (10 Hours)
Probability:
Probability, Random variables, Probability distributions, Mean and variance of distribution, Binomial, Poisson and Hypergeometric distributions, Normal distribution, Distribution of several random variables.

Module-III   (10 Hours)
Mathematical
Statistics:
Random sampling, Estimation of Parameters, Confidence Intervals, Testing of hypothesis, Acceptance sampling, Chi square test for goodness of fit , Regression Analysis, Fitting Straight Lines, Correlation analysis.
Text books:

1. S. C. Chapra and R. P. Canale, " *Numerical methods for Engineers"*, Fifth Edition, McGraw
   Hill Education
   Reading Chapters : 2, 3(3.1, 3.2), 4(4.2, 4.3), 5(5.1, 5.2, 5.3), 6(6.4), 9(9.1, 9.2), 10(10.2), 13(13.1,13.2,13.5), 16(16.1, 16.2), 17(17.3), 20(20.1, 20.2, 20.3)

2. E. Kreyszig," Advanced Engineering Mathematics:, Eighth Edition, Wiley
   India Reading Chapters: 22, 23(except 23.5 and 23.8)

Reference books:
1. Jay L. Devore, "Probability and Statistics for Engineering and Sciences",

Seventh Edition, Thomson/CENGAGE Learning India Pvt. Ltd
P. V.O'Neil, "Advanced Engineering Mathematics", CENGAGE Learning, New Delhi