# BEM-C202
# ENGINEERING MATHEMATICS II

**MM: 100** **Sessional: 30**
**Time: 3 hrs** **ESE: 70**
**L T P** **Credits 4**
**3 1 0**

**NOTE:** The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllabus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

## UNIT I

**Differential Equations:** Ordinary differential equations of first order, orthogonal trajectories, linear differential equations with constant coefficients, Simple applications, Euler- Cauchy equations, Equations of the form $y'' = f(y)$. Solution of second order differential equations by change of dependent and independent variables, Method of variation of parameters for second order differential equations.

## UNIT II

**Partial Differential Equations:** Introduction of partial differential equations, solution of Linear partial differential equations of second order with constant coefficients and their classification, Method of separation of variables.

## UNIT III

**Solution in Series:** Solution in series of second order linear differential equations, Bessel's and Legendre's equations and their solutions, Properties of Bessel function and Legendre's polynomials, Rodrigue's formula, Recurrence relations, Generating functions, Jacobi series, Integral representation of Bessel's functions.

## UNIT IV

**Fourier Series:** Fourier series, Dirichlet's condition and convergence, Change of interval, Half range series, Harmonic analysis.

## UNIT V

**Statistics:** Random variables, Probability mass function, Probability density function, Moments, Moment generating functions. Binomial, Poisson and Normal distributions. Correlation and Regression. Method of least squares and curve fitting - straight line and parabola.

## Text Books / References

1. Kreyszig E., Advanced Engineering Mathematics, John Wiley, New York, 1999
2. Simmons, G.F., Differential Equations with Applications and Historical Notes, McGraw-Hill, 1991.
3. Grewal B.S., Higher Engineering Mathematics, Khanna, New Delhi, 2000
4. Jain R. K., Iyenger S.R.K., Advanced Engineering Mathematics, Narosa , 2002.
5. Miller and Freunds, Probability and Statistics for Engineers, PHI, 2011.
6. Kapur J. N. & Saxena H.C., Mathematical Statistics, S Chand, 2010.