BMAS 1102: ENGINEERING MATHEMATICS II

Course Objectives: To make the students understand the concepts of linear algebra and differential equations by giving more emphasis to their applications in engineering.

Credits: 04 **Semester II** **L–T–P: 3–1–0**

Module No.	Contents	Teaching Hours (Approx.)
1	**Linear Algebra**: Introduction, Types of matrices, Operations on matrices, Complex matrices, Elementary transformations, Rank of a matrix, Consistency and solution of system of linear equations, Eigen values and Eigen vectors. **Ordinary Differential Equations**: Introduction, Solution of n^{th} order linear differential equations with constant coefficients, Complementary function and particular integral, Euler-Cauchy Equations.	20
2	**Solution in Series:** Ordinary point, Regular singular point, Series Solution of linear differential equations of second order, Frobenius method. **Partial Differential Equations:** Introduction, Solution of linear partial differential equations of n^{th} order, Classification of linear partial differential equations of second order, Method of separation of variables.	20

Learning Outcomes:

After studying these topics, the student will be able to

- Know the rank of a matrix and its applications in solving systems of linear equations
- Understand complex matrices
- Find the eigen values and eigen vectors of a square matrix
- Solve ordinary and partial differential equations of higher orders
- Classify the linear partial differential equations as elliptic, parabolic and hyperbolic
- Solve the linear differential equations of second order in a series

Text Books:

- M. Goyal and N. P. Bali, A Text Book of Engineering Mathematics, Laxmi Publication, Delhi, 2014.
- B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 2014.

Reference Books:

- W. E. Boyce and R. D. Prima, Elementary Differential Equations, John Wiley & Sons, 2009.
- M. K. Jain, S. R. K. Iyengar and R. K. Jain, Advanced Engineering Mathematics, Narosa Publishing House, Delhi, 2002.