APPLIED DIFFERENTIAL EQUATIONS

Course Code: **MM24004GE** Total Credits: **02**
Semester: MA/M.Sc. **4th Semester** Total Marks: **50**
Continuous Assessment: **Marks 10**, Theory: **Marks 40** Time Duration: **1½ hrs**

Course objectives: To develop basic foundation of differential equations for their utility in other disciplines, like economics, management, life sciences and Information technology.

Course Outcomes: This course shall help the students in developing techniques and tools for applications in other disciplines using differential equations.

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Unit –I

Introduction: order and degree of a differential equation, formation and solution of a differential equation, variable separable method, homogeneous and Bernoulli's differential equations, exact differential equations, integrating factors, linear differential equations with constant coefficients, particular integrals. Applications of first order differential equations in growth and decay of populations, simple models on tumor dynamics and Leslie Matrices.

Unit -II

Radioactivity and carbon dating, Newton' s law of cooling, second order differential equations, diffusion equation including Laplace, Heat and wave equations. Differential equations in epidemics and models on interaction among species like Lotka-Voltera system.

Books Recommended:

1. Zafar Ahsan, Differential Equations and their Applications, 2nd Ed., PHI, New Delhi, 2004.
2. H.T.H. Piaggo, Differential Equation, PHI New Delhi, 2004.
3. MA Khanday, Introduction to Modeling and Biomathematics, Dilpreet Publishers, New Delhi, 2016
4. Richard Courant, Edward James, McShane, Sam Sloan, Marvin Jay GReenberg, Differential and Integral Calculuss, Ishi Press, 2010.