

Open Elective Course

(For students of Science stream who have not chosen Mathematics as one of the Core Course)

MATOET3.1(A) Ordinary Differential Equations	
Teaching Hours: 3 Hours/Week	Credits: 3
Total Teaching Hours: 42 Hours	Max. Marks: 100 (SEE - 60 + I.A. - 40)

Course Learning Outcomes: This course will enable the students to:

- Understand the concept of the differential equation and their classification
- Know the meaning of the solution of a differential equation.
- To solve first-order ordinary differential equations.
- To solve linear differential equations.
- To solve exact differential equations.
- To find the solution to higher-order linear differential equations with constant coefficients.

Unit I: Recapitulation of Differential equations of first order and first degree, Linear differential equations, Exact differential equations, Necessary and sufficient condition for the equations to be exact. **14hrs**

Unit II: Differential equations of the first order and higher degree: Equations solvable for p , x , y . Clairaut's equation and singular solution. Orthogonal trajectories of cartesian and polar curves. **14hrs**

Unit III: Linear differential equations of second and higher order with constant coefficients. Complimentary function, Particular integral when the RHS is of the form e^{ax} , $\sin(ax+b)$, $\cos(ax+b)$, x^n , e^{ax} V and $x V$, where V is a function of x . **14hrs**

Reference Books:

1. M.D.Raisinghania, Ordinary Differential Equations & Partial Differential Equations, S. Chand & Company, NewDelhi, 2020.
2. J. Sinha Roy and S Padhy: A Course of Ordinary and Partial Differential Equation Kalyani Publishers, NewDelhi, 2014.
3. D Murray, Introductory Course in Differential Equations, Orient Longman(India), 2017.
4. W T Reid, Ordinary Differential Equations, John Wiley, NewDelhi, 2010.
5. M. L. Khanna, Differential Equations, Jai Prakash Nath & Co.Meerut, 1997.
6. Shepley L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons,1984.