SEMESTER- IV

MJC-07: Partial Differential Equations

Course Outcomes

After the completion of the course, the student will be able to:

CO1: Formulate, classify and transform partial differential equations into canonical form.
CO2: Solve linear and non-linear partial differential equations using various methods.
CO3: Solve some physical problems.

MJC-07: Partial Differential Equations (5 credits) Full Marks- 100		
Unit	**Topics to be covered**	**No. of Lectures**
1	Partial differential equations – Basic concepts and definitions, Formation of PDEs, Classification of First order PDEs, Lagrange's and Charpit's method for solving PDEs.	14
2	Homogeneous and non-homogeneous Partial differential equation of second and higher order with constant coefficients, Partial differential equations reducible to equations with constant coefficients.	12
3	Partial differential equations of second order with variable coefficients, Monge's Methods, Classification of second order linear equations as hyperbolic, parabolic or elliptic, Reduction of second order linear equations to canonical forms.	10
4	Fourier series in $(c, c + 2\pi)$, Dirichlet's condition (without proof), Euler's formulae, Fourier series for even and odd functions, Fourier series of arbitrary interval $(0, 2L)$ and $(-L, L)$, Fourier Half range sine and cosine series, Method of Separation of variables, Solution of the Wave, Heat and Laplace equations and their applications.	14
	TOTAL	50

Book References:

1. Sneddon, Ian N. (2006). Elements of Partial Differential Equations. Dover Publications. Indian Reprint.
2. Raisinghania, M. D. (2018).Advanced Differential Equations (19th ed.). S. Chand Publication.
3. Raisinghania, M.D. (2020). Ordinary and Partial Differential Equations (20th ed.). S. Chand Publication.
4. Amarnath T. An elementary course in Partial differential equations (2nd ed.). Narosa Publication.