Curriculum Plan: Generic IV (Maths) IV Year (Semester VIII) Elements of Partial Differential Equations (2025-26) EVEN SEM

Teacher Profile: Sanjay Kumar

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Marks Distribution	**Theory**	75 Marks
	Practical	50 Marks
	Internal Assessment	25
	Total Marks	150
Classes Assigned	**Lectures**	4 per week
	Practical (per week)	4 per week

Reference	**[1]**	**Myint-U, Tyn & Debnath, Lokenath. (2007). Linear Partial Differential Equations for Scientists and Engineers (4th ed.). Birkhäuser. Indian Reprint.**
	[2]	**Piaggio, H.T.H. (2004). Differential Equations. CBS Publishers & Distributors, Delhi.**
	[3]	**Sneddon, Ian N. (2006). Elements of Partial Differential Equations, Dover Publications. Indian Reprint.**

Week	**Topic**
1st week	Review of basic concepts: Origins of first-order PDEs.
2nd week	Lagrange's method for solving linear equations of first order.
3rd week	Integral surfaces passing through a given curve.
4th week	Surfaces orthogonal to a given system of surfaces, Nonlinear PDEs of the first order.
5th week	Compatible systems of first-order PDEs, Charpit's method for solving nonlinear PDEs.
6th week	Special types of first order PDEs, and solutions satisfying given conditions.
7th week	Jacobi's method for solving nonlinear PDE with three independent variables.
8th week	Origins of second-order PDEs, and solving linear PDEs with constant coefficients using methods of finding the complementary function and particular integral.
9th week	Monge's method of integrating nonlinear second-order PDE of type $Rr + Ss + Tt = V$ with variable coefficients.
10th week	Solution of one-dimensional diffusion equation by method of separation of variables.
11th week	Solution of one-dimensional wave equation by method of separation of variables.
12th week	D'Alembert's solution of the Cauchy problem for the one-dimensional wave equation
13th week	Solutions of homogeneous one-dimensional wave equations with initial boundary value problems.
14th week	Vibration of finite string with fixed ends.
15th week	Traffic flow model.