**Curriculum Plan: B. Sc. (Hons) Maths II Year (Semester IV), Partial Differential Equation** **(Including Practical), ODD SEM 2025-26**

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| **Teacher Profile:**  **Sanjay Kumar**  Department of Mathematics  Kalindi College, University of Delhi, Delhi- 110008  Mobile: +91-8800982887  **E- mail**: sanjaykumar@kalindi.du.ac.in | |  | **Marks Distribution** | **Theory** | 90 Marks | |
| **Practical** | 40 Marks | |
| **Internal Assessment** | Assignments 30 Marks | |
| **Classes Assigned** | **Lectures** | 3 per week | |
| **Practical Groups**  (per week per Student) | 2 per week | |
| **Reference** | **[1]** | Myint-U, Tyn & Debnath, Lokenath. (2007). Linear Partial Differential Equation for Scientists and Engineers (4th ed.). Springer, Third Indian Reprint, 2013. | | | | |
|  | **[2]** | Sneddon, Ian N. (2006). Elements of Partial Differential Equations, Dover Publications. Indian Reprint. | | | | |
| **Section** | **Week** | **Topic** | | | |  | |
| Session 1 | **1st week** | Basic concepts, classification, construction. | | | |  | |
|  | **2nd week** | Geometrical interpretation of first-order PDEs. | | | |
| Session 2 | **3rd week** | Method of characteristics and general solutions, Cauchy problem for a first-order PDE. | | | |  | |
| **4th week** | Canonical forms of first-order linear equations; Method of separation of variables. | | | |  | |
| **5th week** | Charpit’s method for solving non-linear PDEs. | | | |  | |
|  | **6th week** | Classification (hyperbolic, parabolic, and elliptic), reduction to canonical forms. | | | |  | |
|  | **7th week** | General solutions of second-order linear PDEs. | | | |  | |
| Session 3 | **8th week** | Higher order linear partial differential equations with constant coefficients. | | | |  | |
|  | **9th week** | Mathematical models: The vibrating string, vibrating membrane. | | | |  | |
|  | **10th week** | Conduction of heat in solids, the gravitational potential. | | | |  | |
|  | **11th week** | Conservation laws and the Burgers equation, Traffic flow. | | | |  | |
| Session 4 | **12th week** | Cauchy problem and wave equations: Solutions of homogeneous wave equations with initial boundary-value problems. | | | |  | |
|  | **13th week** | Cauchy problem and wave equations: Non-homogeneous boundary conditions. | | | |  | |
|  | **14th week** | Cauchy problem for non-homogeneous wave equations. | | | |  | |
|  | **15th week, 16th week** | Revision and assignment Problems | | | |  | |