PROGRAME NAME: B.Sc.(H) Mathematics
COURSE NAME: Partial Differential Equations
SEMESTER DURATION: January to May

Week	Topic(s)	Teaching Methodology Adopted/ Continuous Internal Evaluation
1.	Introduction, Classification, Construction of first order partial differential equations (PDE).	Presentations
2.	Method of characteristics and general solution of first order PDE.	Lectures/Discussions
3.	Canonical form of first order PDE, Method of separation of variables for first order PDE.	Lectures
4.	The vibrating string, Vibrating membrane, Gravitational potential, Conservation laws.	Presentations/lectures
5.	Reduction to canonical forms.	Case Study/Practicals
6.	Equations with constant coefficients, General solution.	Practicals
7.	The Cauchy problem for second order PDE.	Lectures
8.	Homogeneous wave equation.	Demonstration/Lectures

9.	Initial boundary value problem, Non-homogeneous boundary conditions	Lectures
10.	Finite string with fixed ends, Non – homogeneous wave equation, Goursat problem	Practicals
11.	Method of separation of variables for second order PDE.	Practicals
12.	Vibrating string problem.	Case study/Lectures
13.	Existence (omit proof) and uniqueness of vibrating string problem.	Assignments
14.	. Heat conduction problem. Existence (omit proof) and uniqueness of the solution of heat conduction problem. Non – homogeneous problem	Assignments

Course Objectives: The main objectives of this course are to teach students to form and solve partial differential equations and use them in solving some physical problems.

Course Learning Outcomes: The course will enable the students to:
   i)   Formulate, classify and transform partial differential equations into canonical form.
   ii)   Solve linear and non-linear partial differential equations using various methods; and apply these methods in solving some physical problems.