



# ARSD College, University of Delhi

## Lesson Plan (LAB)

<b>Course Name :B.Sc.(hons)Chem</b>						
Semester	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical (P)	Credit (C)
IV	BMATH408	Partial Differential Equations	0	0	4	2
Teacher/Instructor(s)		PREETI JAIN and CHHATRA PAL				
Session		2021-22				

### Course Description:

This course includes a variety of methods to solve partial differential equations with basic applications to real life problems by using software “Maxima.” It provides a solid foundation to further in mathematics, sciences, and engineering through mathematical modeling.

### List of Experiments:

Details of the Lab Course		
Session	Name of Experiment	Contact Hours
1	Solution of Cauchy problem for first order PDE.	6
2	Plotting the characteristics for the first order PDE.	6
3	Plot the integral surfaces of a given first order PDE with initial data.	6
4	Solution of wave equation for any two functions: (i) $u(x, 0) = \phi(x), u_t(x, 0) = f(x), x \in \mathbb{R}, t > 0.$ (ii) $u(x, 0) = \phi(x), u_t(x, 0) = f(x), u(0, t) = 0, x > 0, t > 0.$ (iii) $u(x, 0) = \phi(x), u_t(x, 0) = f(x), u_x(0, t) = 0, x > 0, t > 0.$ (iv) $u(x, 0) = \phi(x), u_t(x, 0) = f(x), u(0, t) = 0, u(l, t) = 0, 0 < x < l, t > 0.$	8
5	Solution of one-dimensional heat equation $u_t = k u_{xx}$ , for a homogeneous rod of length $l$ . That is - solve the IBVP: $u_t = k u_{xx}, \quad 0 < x < l, \quad t > 0,$ $u(0, t) = f(x), \quad u(l, t) = 0, \quad t \geq 0,$ $u(x, 0) = \phi(x), \quad 0 \leq x \leq l.$	8
6	Solving systems of ordinary differential equations.	6
7	Draw the various sequence of functions on the given interval and discuss the pointwise convergence	8
8	Discuss the uniform convergence of sequence of functions discussed in practical no.7	8
<b>Total</b>		<b>56</b>
<b>Suggested Books:</b>		
		<b>Year of</b>

Sl. No.	Name of Authors/Books/Publishers	Publication/Reprint
1.	Myint-U, Tyn and Debnath, Lokenath (2007). Linear Partial Differential Equations for Scientist and Engineers (4th ed.). Birkhäuser Boston. Indian Reprint.	2007

**Evaluation Scheme:**

No.	Component	Duration	Marks
1.	Internal Assessment		25
	<ul style="list-style-type: none"> <li>• Quiz/Viva</li> <li>• Observation &amp; Record</li> <li>• Attendance</li> <li>• Model Exam</li> </ul>		
2.	End Semester Examination	3 hr	50