



ARSD College, University of Delhi

Lesson Plan

Course Name : B.Sc. (Hons) Physics Lab						
Semester	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical (P)	Credit (C)
I	32221101	Mathematical Physics-I (Lab)			4	2
Teacher/Instructor(s)		Dr. Ashutosh Vishwa Bandhu, Dr. Rakesh Malik, Dr. Shankar Subramanian				
Session		2021-2022				

Course Objective

The aim of this Lab is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics. The course will consist of practical sessions and lectures on the related theoretical aspects of the Laboratory. Evaluation to be done not only on the programming but also on the basis of formulating the problem. Aim is to teach students to construct the computational problem to be solved.

List of Experiments:

Details of the Lab Course		
Session	Name of Experiment	Contact Hours
1	To calculate area of a rectangle. To check size of variables in bytes using <i>sizeof</i> operator.	4
2	To convert plane polar to Cartesian coordinates and vice versa	4
3	To find roots of a quadratic equation	4
4	To find largest of three numbers. To check whether a number is prime or not.	4
5	To list Prime numbers up to 1000	4

6	To find value of pi using Monte Carlo simulations	4
7	To approximate $\sin(x)$ and $\cos(x)$ by a finite number of terms of Taylor's series.	4
8	To find sum and average of a list of numbers, To find largest of a given list of numbers and its location in the list.	4
9	To sort numbers in ascending and descending order using Bubble sort and Sequential sort	4
10	To find the a given element in an array its position using Binary search,	4
11	To perform the matrix operations like sum, product and transpose.	4
12	To solve the given algebraic and transcendental equation using Bisection Method	4
13	To solve the given algebraic and transcendental equation using Newton Raphson Method	4
14	To find the value of unknown resistance using Least square fitting	4
15	To find velocity and acceleration from given position data using numerical differentiation.	4
Total		60

Suggested Books:

Sl. No.	Name of Authors/Books/Publishers	Year of Publication/Reprint
1.	Schaum's Outline of Programming with C++', J. Hubbard, McGraw-Hill Education.	2000
2.	Introduction to Numerical Analysis, S.S. Sastry, 5 th Edn., PHI Learning Pvt. Ltd.	2012
3.	Computational Physics, Darren Walker, 1 st Edn., Scientific International Pvt. Ltd	2015
4.	Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn., , Wiley India Edition	2007

Evaluation Scheme:

No.	Component	Duration	Marks
1.	Internal Assessment	-	25
	• Quiz/Viva		
	• Observation & Record		
	• Attendance		
2.	End Semester Examination	5 Hours	25

