Institute/School Name	Chitkara University, Himachal Pradesh/CSOET		
Program Name **Semester** **Batch**	B.E. (CSE) I 2021		
Course Code	PH111		
Course Name	Modern and Computational Physics Lab		
Lecture / Tutorial/Lab (per week)	0 -0 -2	**Course Credits**	1.0
Course Coordinator Name	Tapas Sharma		

1. Scope of the Course

a) The objective of laboratory is to realize theoretical concepts experimentally. The experiments are designed to cover different areas of Physics i.e., Optics, Lasers, and Modern Physics.
b) To give an overview of the concept of Lasers, optical fibres, Michelson's Interferometer, susceptibility and Polarisation in solution.
c) To compare the observed and theoretical results for various concepts and analyze the reasons of deviation.
d) To handle the various equipments available in lab to the Physics concepts and implement these concepts in day to day life.

2. Objectives of the course

The main objectives of the course that the students:

i. Should understand the basics of LASERs and their application in Fiber Optics communication.
ii. Learn the fundamentals of Semiconductors based on Quantum theory of Electrons and their basic Engineering application.
iii. Should assimilate the knowledge about magnetic characteristics of materials used for digital information storage.
iv. Should know the basic Principles of superconductivity and properties of superconductors.

3. **Course Learning Outcomes**

i. Possess an ability to apply knowledge of fundamental physical concepts and appropriate mathematics involved in the course.
ii. Possess an ability to analyse a physical problem, and suggest the possible solution of that problem.
iii. Apply fundamental principles of physics together with analytic tools to evaluate and describe physical situations appropriate to address a research problem.
iv. Possess an ability to explore physical systems by setting up experiments, collecting and analyzing data, identifying sources of uncertainty, and interpreting their results in terms of the fundamental principles and concepts of physics.
v. Possess an ability to evaluate and analyse scientific measurement and error analysis.
vi. Apply the fundamental concepts of physics to related engineering problems.

***4.* Text Books**

TB: Lab Manuals prepared by faculty of Physics.

***5.* Reference Books**

RB1: Practical physics by Squires, Cambridge University press.
RB2: Practical Physics C.L.Arora
RB3: Engg.Physics Practicals :Dr B Srinivasa Rao, Kesava Vamsi Krishnav, K.S Rudramba
RB4: Engg.Physics Theory and Practicals :AK Katiar, C.K Pandey
RB5: Introductory Engg.Physics with Laboratory manuals

6. Other readings and relevant websites

S.No.	**Link of Journals, Magazines, websites and Research Papers**
1.	http://vlab.amrita.edu/?sub=1&brch=192&sim=854&cnt=7
2.	http://www.arcelect.com/fibercable.htm
3.	https://www.newport.com/t/fiber-optic-basics
4.	http://vlab.amrita.edu/?sub=1&brch=189&sim=1106&cnt=1
5.	http://iiith.vlab.co.in/?sub=19&brch=208&sim=563&cnt=1
6.	http://www.explainthatstuff.com/fiberoptics.html
7.	http://iitk.vlab.co.in/?sub=27&brch=80&sim=223&cnt=535
8.	http://www.electronics-tutorials.ws/electromagnetism/hall-effect.html
9.	https://play.google.com/store/apps/details?id=com.apniPhysics.youtuber.DrSushilGuruji

7. Course Plan

S. No.	**Experiment Detail**
1	To determine attenuation & propagation losses in optical fibre**.**
2	To determine numerical aperture of an optical fibre**.**
3	To study the Hall effect in a semiconductor**.**
4	To determine Planck's constant by using light emitting diodes.
5	To find out the Mass Susceptibility of $FeCl_3$ by Quinke's Method.
6	To draw the B-H curve of a given magnetic material.
7	To determine the wavelength of light using Michelson's Interferometer.
8	To measure the specific rotation of cane sugar solution using Laurent's half shade polarimeter.
9	Study of Diffraction using Laser beam and thus to determine the wavelength/grating element.
10	To study the laser beam characteristics like wave length, aperture & divergence etc.
11	To determine the ionization potential of mercury using a gas filled diode**.**
12	To determine e/m ratio of electron by using Thomson method**.**
13	To study the variation of magnetic field with distance along the axis of a current carrying coil using Stewart and Gee's apparatus.

Note: Students have to perform a minimum of ten experiments from the above list.

8. Evaluation Scheme:

Component 1*	Continuous Evaluation	40
Component 2	Internal Viva – Voce	20
Component 3**	End Term	40
	Total	100

*Lab Performance will be evaluated periodically.

**The End Term examination for practical courses is held at the end of semester and includes conduct of experiment and an oral examination (viva voce).The mandatory requirement of 75% attendance in all lab classes is to be met for being eligible to appear in this component

This document is approved by

Designation	Name	Signature
Course Coordinator	Tapas Sharma	
HOD/Deputy Dean	Dr.Ashok Kumar	
Date	21-11-2021	

Department of Applied Sciences (Physics)

Modern and computational Physics Lab

S. No.	Experiment Detail	Abbreviation of experiment
1	To determine attenuation & propagation losses in optical fibre**.**	**AP**
2	To determine numerical aperture of an optical fibre**.**	**NA**
3	To study the Hall effect in a semiconductor**.**	**HE**
4	To determine Planck's constant by using light emitting diodes.	**PC**
5	To find out the Mass Susceptibility of $FeCl_3$ by Quinke's Method.	**QM**
6	To draw the B-H curve of a given magnetic material.	**BH**
7	To determine the wavelength of light using Michelson's Interferometer.	**MI**
8	To measure the specific rotation of cane sugar solution using Laurent's half shade polarimeter.	**LHSP**
9	Study of Diffraction using Laser beam and thus to determine the wavelength/grating element.	**DG**
10	To study the laser beam characteristics like wave length, aperture & divergence etc.	**LBC**
11	To determine the ionization potential of mercury using a gas filled diode**.**	**IP**
12	To determine e/m ratio of electron by using Thomson method**.**	**e/m**
13	To study the variation of magnetic field with distance along the axis of a current carrying coil using Stewart and Gee's apparatus.	**SG**

Grid for allotment of experiments

Group	1	2	3	4	5	6	7	8	9	10	11	12
A	QM	AP	PC	HE	DG	LBC	BH	E/M	IP	NA	MI	LHSP
B	AP	PC	HE	DG	LBC	QM	E/M	IP	NA	MI	LHSP	BH
C	PC	HE	DG	LBC	QM	AP	IP	NA	MI	LHSP	BH	E/M
D	HE	DG	LBC	QM	AP	PC	NA	MI	LHSP	BH	E/M	IP
E	DG	LBC	QM	AP	PC	HE	MI	LHSP	BH	E/M	IP	NA
F	LBC	QM	AP	PC	HE	DG	LHSP	BH	E/M	IP	NA	MI
G	QM	AP	PC	HE	DG	LBC	BH	E/M	IP	NA	MI	LHSP
H	AP	PC	HE	DG	LBC	QM	E/M	IP	NA	MI	LHSP	BH
I	PC	HE	DG	LBC	QM	AP	IP	NA	MI	LHSP	BH	E/M
J	HE	DG	LBC	QM	AP	PC	NA	MI	LHSP	BH	E/M	IP
K	DG	LBC	QM	AP	PC	HE	MI	LHSP	BH	E/M	IP	NA
L	LBC	QM	AP	PC	HE	DG	LHSP	BH	E/M	IP	NA	MI

Tapas Sharma

COC