University of Asia Pacific (UAP)

Department of Computer Science and Engineering (CSE)

B.Sc. in CSE Program

Course Outline – Physics for Computer Science Lab

Part A – Introduction

1. **Course No. / Course Code:** PHY 102
2. **Course Title:** Physics for Computer Science Lab
3. **Course Type:** Sessional
4. **Level/Term and Section:** 1st year 1st Semester
5. **Academic Session:** Fall 2024
6. **Course Instructor:** Shuva Saha, Lecturer, Department of BS&H, UAP.
7. **Pre-requisite (If any):** N/A
8. **Credit Value:** 1.5
9. **Contact Hours:** 3.0
10. **Total Marks:** 100
11. **Course Objectives and Course Summary:**

The objectives of this course are to:

1. Understand the principles of operation of a range of instruments and will be able to carry out measurements using them;
2. Analyze the problems encountered in experimental physics;
3. Evaluate the results after solving the problems;
4. Applying their understandings in resolving similar complications.
5. Create own design, maintaining the basic principles of Physics.

12. **Course Learning Outcomes: At the end of the Course, the Student will be able to –**

CLO 1	Have better and longer lasting **understanding** of physical principles

CLO 2	Get an exercise in **solving** problems based on real physical situations.
CLO 3	Experience and appreciate of the various methods **used** in experimental physics.
CLO 4	Have better **understanding** of and competence in the use of standard apparatus.

13. Mapping / Alignment of CLOs with Program Learning Outcomes (PLO) (Optional):

CLO No.	Corresponding PLOs (Appendix-1)	Bloom's taxonomy domain/level (Appendix-2)	Delivery methods and activities	Assessment Tools
CLO1	1	Remember (Cognitive)	Lecture with practical demonstration, group discussion	Written lab quiz, Individual lab report, viva, class performance
CLO2	1	Understand (Cognitive)	Lecture with practical demonstration, group discussion	Written lab quiz, Individual lab report, viva, class performance
CLO3	4	Apply (Cognitive)	Lecture with practical demonstration, group discussion	Written lab quiz, Individual lab report, viva, class performance
CLO4	5	Analyze (Cognitive)	Lecture with practical demonstration, group discussion	Written lab quiz, Individual lab report, viva, class performance

Part B – Content of the Course

14. Course Content:

1. Determination of the acceleration due to gravity "g" by a compound pendulum.
2. Determination of the spring constant and effective mass of a loaded spring.
3. Determination of the line frequency by Lissajous figures using an oscilloscope and a function generator and verification of the calibration of the Time/Div knob at a particular position for different frequencies.
4. Determination of the specific resistance of a wire using a meter bridge.
5. Determination of the resistance of the galvanometer by half deflection method.

6. Determination of the threshold frequency of a Photo cathode and verification of the Plank's constant.
7. Determination of the radius of curvature of a lens by Newton's rings.
8. Determination of the specific rotation of a sugar solution by means of polarimeter.
9. Determination of the variation of the frequency of the tuning fork with the length of a sonometer (n-l curve) under given tension and hence determination of the unknown frequency of a tuning fork.
10. To determine the velocity of sound by acoustic transducer.
11. To verify the law of Malus.
12. Determination of the specific heat capacity of a liquid by the method of cooling.

15. Alignment of topics of the courses with CLOs:

SL. No	Topics / Content	Course Learning Outcome (CLO)
1	Determination of the acceleration due to gravity "g" by a compound pendulum.	**CLO 1-4**
2	Determination of the spring constant and effective mass of a loaded spring.	**CLO 1-4**
3	Determination of the line frequency by Lissajous figures using an oscilloscope and a function generator and verification of the calibration of the Time/Div knob at a particular position for different frequencies.	**CLO 1-4**
4	Determination of the specific resistance of a wire using a meter bridge.	**CLO 1-4**
5	Determination of the resistance of the galvanometer by half deflection method.	**CLO 1-4**
6	Determination of the threshold frequency of a Photo cathode and verification of the Plank's constant.	**CLO 1-4**
7	Determination of the radius of curvature of a lens by Newton's rings.	**CLO 1-4**
8	Determination of the specific rotation of a sugar solution by means of polarimeter.	**CLO 1-4**
9	Determination of the variation of the frequency of the tuning fork with the length of a sonometer (n-l curve) under given	**CLO 1-4**

	tension and hence determination of the unknown frequency of a tuning fork	
10	To determine the velocity of sound by acoustic transducer.	**CLO 1-4**
11	To verify the law of Malus.	**CLO 1-4**
12	Determination of the specific heat capacity of a liquid by the method of cooling.	**CLO 1-4**

16. Class Schedule/Lesson Plan/Weekly plan:

Topics	Specific Outcome(s)	Time Frame	Suggested Activities	Teaching Strategy(s)	Alignment with CLO
Basic Introductory class	To provide an overview of the course	Week 1	An overview of the course outline and discussing the week-by-week development of the topics in the syllabus	Lecture, Multimedia	CLO 1
Determination of the acceleration due to gravity "g" by a compound pendulum.	Explore the basic ideas of acceleration due to gravity, pendulum, and oscillation	Week 2	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4
Determination of the spring constant and effective mass of a loaded spring.	Obtain details ideas on spring constant, restoring force, Hooks law and effective mass	Week 3	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4
Determination of the line frequency by Lissajous figures using	Details about the oscilloscope	Week 4	Lecture, Practical demonstration	Lecture with practical demonstration,	CLO 1-4

an oscilloscope and a function generator and verification of the calibration of the Time/Div knob at a particular position for different frequencies.	and digital function generator			group discussion	
Determination of the specific resistance of a wire using a meter bridge.	Practical knowledge on meter bridge & its principle	Week 5	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4
Determination of the resistance of the galvanometer by half deflection method.	Able to know about the working principle & functions of Galvanometer	Week 6	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4
Determination of the threshold frequency of a Photo cathode and verification of the Plank's constant.	To be able to verify the photoelectric effect & Planck's constant value	Week 7	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4
Determination of the radius of curvature of a lens by Newton's rings.	Fundamental knowledge of interference phenomena	Week 8	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4
Determination of the specific rotation of a sugar solution by means of a polarimeter.	Fundamental knowledge of optical activity phenomena	Week 9	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4
Determination of the variation of the frequency of the tuning fork with the length of a sonometer (n-l curve) under given tension and hence determination of	To gain the advance knowledge of oscillations, stationary waves and resonance	Week 10	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4

the unknown frequency of a tuning fork.					
To determine the velocity of sound by acoustic transducer.	To gain the details of the sound velocity	Week 11	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4
To verify the law of Malus.	Gain details on polarization & verify Malus law	Week 12	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4
Lab Viva	Final Examination	Week 13	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4
Lab Final Examination	Final Examionation	Week 14	Lecture, Practical demonstration	Lecture with practical demonstration, group discussion	CLO 1-4

17. **Teaching-Learning Strategies:** Lecture with practical demonstration, group discussion
18. **Assessment Techniques of each topic of the course:** Written lab quiz, Individual lab report, Lab viva, class performance

Part C – Assessment and Evaluation

19. Assessment Strategy

Bloom's Catergory Marks (Out of 100)	**Lab Final (50)**	**Lab Viva (20)**	**Lab Report (20)**	**Lab performance (10)**
Remember	20	10		
Understand	20	10	10	
Apply	10		10	
Analyze				10
Evaluate				

Create				

20. Evaluation Policy

Grades will be calculated as per the university grading structure and individual student will be evaluated based on the following criteria with respective weights.

1. Lab performance 10%
2. Lab report 20%
3. Lab Viva 20%
4. Lab Final Examination 50%

UAP Grading Policy

Numeric Grade	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	D	2.00
Less than 40%	F	0.00

Part D – Learning Resources

21. Text Book

1. Practical Physics for Degree Students, Dr. Giasuddin Ahmed and Md. Sahabuddin Ahmed.

22. Reference Books & Materials

1. Practical Physics for Degree Students, Dr. Giasuddin Ahmed and Md. Sahabuddin Ahmed.