



# Course Specification

## (Bachelor)

Course Title: **General Physics Lab (1)**

Course Code: **PHY 1119**

Program: **B. Sc. in Engineering**

Department: **Physics**

College: **Science**

Institution: **Imam Mohammad Ibn Saud Islamic University**

Version: **1-Template 2024**

Last Revision Date: **26/09/2024**

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## A. General information about the course:

### 1. Course Identification

1. Credit hours: ( 1 )

#### 2. Course type

A. ☐ University ☐ College ☐ Department ☐ Track ☒ Others  
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: ( Level 1/ Year 1 )

#### 4. Course General Description:

This course introduces basic laboratory techniques and experimental methods in physics, focusing on connecting theoretical concepts with hands-on experiments. Each class includes a short lecture on the experiment's procedures, key concepts, formulas, and expectations. Topics include measurements and uncertainties, free fall, forces in equilibrium, simple pendulum, harmonic motion, conservation of mechanical energy, motion at constant speed and acceleration, friction, Newton's second law, and Ohm's law.

5. Pre-requirements for this course (if any):

6. Co-requisites for this course (if any):

Physics (1), PHY 1117

#### 7. Course Main Objective(s):

- Observe and analyze physical data relevant to some of the experiments in mechanics.
- Provide students with a thorough understanding of the basic concepts of physics and the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis.
- Develop the student's mathematical ability to manipulate formulae and derive correct numerical solutions that can be measured in the real world.
- Instruct students in the competent use of laboratory equipment to collect and record data, apply relevant mathematical models and perform required computations, and present the derived results as an application of a measured observation of the physical world.

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning		





No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>		
4	Distance learning		

### 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	0
2.	Laboratory/Studio	30
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
Total		30

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Outline and state non-accelerated and accelerated motions of an object through kinematics equations.		<ul style="list-style-type: none"> <li>Lectures.</li> <li>Tutorials.</li> <li>Class discussions.</li> </ul>	<ul style="list-style-type: none"> <li>Exams.</li> <li>Participation.</li> <li>Discussions.</li> </ul>
1.2	Describe and define the basics of Newton's law experiment for linear motion and simple harmonic motion and the concepts of mechanical energy.		<ul style="list-style-type: none"> <li>Lectures.</li> <li>Tutorials.</li> <li>Class discussions.</li> </ul>	<ul style="list-style-type: none"> <li>Exams.</li> <li>Homework.</li> <li>Quizzes.</li> </ul>
1.3	Define and recall the basic knowledge of electricity and Ohm's law.		<ul style="list-style-type: none"> <li>Lectures.</li> <li>Class discussions.</li> <li>Tutorials.</li> </ul>	<ul style="list-style-type: none"> <li>Participation.</li> <li>Exams.</li> <li>Discussions.</li> <li>Homework.</li> </ul>
2.0	Skills			
2.1	Analyze experiments according to the plan besides the learning from lab lecture.		<ul style="list-style-type: none"> <li>Lectures.</li> <li>Class discussions.</li> <li>Tutorials.</li> </ul>	<ul style="list-style-type: none"> <li>Exams.</li> <li>Discussions.</li> <li>Participation.</li> </ul>





Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.2	Explain and use information from the output of experiment to draw conclusions.		<ul style="list-style-type: none"> <li>Problem classes and group tutorial.</li> <li>Homework assignments as well as problems solutions.</li> </ul>	<ul style="list-style-type: none"> <li>Exams.</li> <li>Discussions.</li> <li>Homework.</li> </ul>
2.3	Summarize conclusions and write reports.		<ul style="list-style-type: none"> <li>Lectures.</li> <li>Class discussions.</li> <li>Tutorials.</li> <li>Encourage students to use electronic mail and internal network for submitting homework and assignments.</li> <li>Use digital library.</li> </ul>	<ul style="list-style-type: none"> <li>Exams.</li> <li>Participation and activities of students in the course community and blackboard.</li> <li>Homework.</li> </ul>
2.4	Communicate in a clear and concise manner orally, paper and using IT for acquiring and analyzing information.		<ul style="list-style-type: none"> <li>Lectures.</li> <li>Class discussions.</li> <li>Encourage students to use electronic mail and internal network for submitting homework and assignments.</li> <li>Use digital library.</li> </ul>	<ul style="list-style-type: none"> <li>Exams.</li> <li>Participation and activities of students in the course community and blackboard.</li> <li>Feedback and explanations.</li> </ul>
3.0	Values, autonomy, and responsibility			
3.1	Show the collaboration and inter-professionalism in class discussions or team works, as well as solve problems independently.		<ul style="list-style-type: none"> <li>Small team tasks</li> <li>Open discussion at classroom.</li> <li>Office hours.</li> </ul>	<ul style="list-style-type: none"> <li>Participation.</li> <li>Homework.</li> <li>Mini-project(s).</li> </ul>

### C. Course Content

No	List of Topics	Contact Hours
1.	<b>Experiment 1:</b> Measurements and uncertainties. Virtual experience.	3
2.	<b>Experiment 2:</b> Free fall.	3
3.	<b>Experiment 3:</b> Forces in equilibrium.	3
4.	<b>Experiment 4:</b> Simple pendulum.	3
5.	<b>Experiment 5:</b> Constant Spring.	3
6.	<b>Experiment 6:</b> Simple harmonic motion.	3
7.	<b>Experiment 7:</b> Free fall: Conservation of mechanical energy of a uniformly accelerated mass.	3
8.	<b>Experiment 8:</b> Describe the movement of an object moving at a constant speed and constant acceleration.	3





9.	<b>Experiment 9:</b> Friction and Newton's second law.	3
10.	<b>Experiment 10:</b> Ohm's Law.	3
<b>Total</b>		<b>30</b>

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	<b>Class Activities</b> (class quizzes, homework, solving problems, etc.....)	<b>weekly</b>	<b>35 %</b>
2.	<b>Midterm Exam 1</b>	<b>6<sup>th</sup> week</b>	<b>7.5 %</b>
3.	<b>Midterm Exam 2</b>	<b>12<sup>th</sup> week</b>	<b>7.5 %</b>
4.	<b>Final Exam</b>	<b>15<sup>th</sup> week</b>	<b>50 %</b>

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

## E. Learning Resources and Facilities

### 1. References and Learning Resources

<b>Essential References</b>	
<b>Supportive References</b>	
<b>Electronic Materials</b>	<a href="https://units.imamu.edu.sa/colleges/en/science/Pages/default.aspx">https://units.imamu.edu.sa/colleges/en/science/Pages/default.aspx</a>
<b>Other Learning Materials</b>	<ul style="list-style-type: none"> <li>Laboratory Manual supplied by the Department of Physics.</li> <li>Laboratory Manual is available at the website of the Department of Physics.</li> </ul>

### 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> <li>- <b>Classrooms.</b></li> <li>- <b>Labs.</b></li> </ul>
<b>Technology equipment</b> (projector, smart board, software)	<ul style="list-style-type: none"> <li>- <b>Classroom equipped with a whiteboard and a projector.</b></li> </ul>
<b>Other equipment</b> (depending on the nature of the specialty)	



## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students Second examiner	Indirect (The students complete the evaluation forms at the end of term. Final exam is evaluated by the second examiner)
Effectiveness of Students assessment	Instructors	Direct (exams, HW, project, ...)
Quality of learning resources	Faculty Students	indirect (surveys)
The extent to which CLOs have been achieved	Instructors Program Leaders	Direct (excel sheet)
Other		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	Quality Unit-Physics Department
<b>REFERENCE NO.</b>	Department council No. 06
<b>DATE</b>	26/09/2024

