Course Specification
(Bachelor)

Course Title:	**General Physics**
Course Code:	**PHY 1103**
Program:	**B.Sc. in Computer Science (Computer Science, Information Technology, Information Management, Information Technology).**
Department:	**Physics**
College:	**Science**
Institution:	**Imam Mohammad Ibn Saud Islamic University**
Version:	3
Last Revision Date:	**29/09/2024**

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A. General information about the course:

1. Course Identification

1. Credit hours: 3 (2 Lectures, 1 Lab, 0 Tutorial)					
3 (2 Lectures, 1 Lab, 0 Tutorial)					
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:					
In this course, students will learn the fundamentals of electrostatics and develop problem-solving skills through practical applications of physical principles. Topics include vectors, electric fields, electric potential, capacitance, current, and resistance. The course also introduces laboratory techniques, emphasizing the connection between physics concepts and real-life applications. Each class includes a short lecture on procedures, concepts, formulas, and lab expectations. Attendance and participation are mandatory. Experiments are typically done in groups, but each student must submit an individual report. Lab topics include measurements and uncertainties, free fall, forces in equilibrium, simple pendulum, simple harmonic motion, conservation of mechanical energy, friction, Newton's second law, and Ohm's law.					
5. Pre-requirements for this course (if any)**: None**					
6. Co-requisites for this course (if any)**: None**					

7. Course Main Objective(s):

- **Build up basic skills necessary for solving problems with practical applications by using physical principles.**
- **Learn and understand the basic knowledge in electrostatics.**
- **Demonstrate the ability to formulate, interpret and draw inferences from their knowledge.**
- **Demonstrate competence with a wide variety of mathematical tools and techniques.**
- **Develop a good understanding and appreciation of electrostatics.**
- **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	60	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	-
4.	**Tutorial**	-
5.	**Others (specify)**	-
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Describe the concepts and principles in introductory study of physics.**		• Lectures. • Tutorials. • Class discussions.	▪ Exams. ▪ Participation. ▪ Discussions.
1.2	**Recognize the underlying physical principles behind various daily life phenomena.**		• Lectures. • Tutorials. • Class discussions.	▪ Exams. ▪ Homework. ▪ Quizzes.
1.3	**Recall the basics laws of electrostatics and mechanics.**		• Lectures. • Class discussions. • Tutorials.	▪ Participation. ▪ Exams. ▪ Discussions.

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
				▪ Homework.
1.4	**Define simple mathematical techniques for quantitative analysis in solving physics problems.**		• Lectures. • Class discussions. • Tutorials.	▪ Participation. ▪ Exams. ▪ Discussions. ▪ Homework.
2.0	**Skills**			
2.1	**Explain and summarize the basic knowledge gained from studying electrostatics and mechanics.**		• Lectures. • Class discussions. • Tutorials.	▪ Exams. ▪ Discussions. ▪ Participation.
2.2	**Develop the students ability to solve and analyze problems in physics related the topics covered by the course.**		• Problem classes and group tutorial.	▪ Exams. ▪ Discussions. ▪ Homework.
2.3	**Explain and use information from the output of experiment to draw conclusions.**		Experiments setting up, data recording and calculations based on lab manual and lectures (co-requisites).	▪ Compare with standard results. ▪ Feedback and explanations.
2.4	**Summarize conclusions and write reports.**		Experiments setting up, data recording and calculations based on lab manual and lectures (co-requisites).	▪ Compare with standard results. ▪ Feedback and explanations.
2.5	**Communicate in a clear and concise manner orally, and using IT for acquiring and analyzing information.**		• Lectures. • Class discussions. • Tutorials. • Encourage students to use electronic mail and internal network for submitting homework and assignments. • Use digital library.	▪ Exams. ▪ Participation and activities of students in the course community and blackboard. ▪ Homework.
3.0	**Values, autonomy, and responsibility**			

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	**Show the collaboration and inter-professionalism in class discussions or team works, as well as solve problems independently.**		• Small team tasks. • Open discussion at classroom. • Office hours.	▪ Participation. ▪ Homework. ▪ Mini-project(s).

C. Course Content

No	List of Topics	Contact Hours
1.	**Vectors:** Coordinate systems, vector and scalar quantities, some properties of vectors, components of a vector and unit vectors, the scalar product of two vectors, the cross product of two vectors.	4
2.	**Electric field:** Properties of electric charges, insulators and conductors, Coulomb's law, electric field created by one charge and group of charges, electric field lines, motion of charged particles in uniform electric field.	6
3.	**Electric potential:** Potential difference and electric potential, potential difference in a uniform electric field, electric potential and potential energy due to point charges.	5
4.	**Capacitance:** Definition of capacitance, calculating Capacitance for parallel plate capacitors, connection of capacitors, energy stored in a charged capacitor.	5
5.	**Current and resistance:** Electric current, resistance and Ohm's law, electrical energy and power.	5
6.	**Direct current circuits:** Electromotive force, resistors in series and parallel, Kirchhoff's rules, RC circuits.	5
	List of Topics (Laboratory)	
1.	**Experiment 1:** Measurements and uncertainties. Virtual experience.	2
2.	**Experiment 2:** Free fall.	3
3.	**Experiment 3:** Forces in equilibrium.	3
4.	**Experiment 4:** Simple pendulum.	3
5.	**Experiment 5:** Constant Spring.	3
6.	**Experiment 6:** Simple harmonic motion.	3
7.	**Experiment 7:** Free fall: Conservation of mechanical energy of a uniformly accelerated mass.	3
8.	**Experiment 8:** Describe the movement of an object moving at a constant speed and constant acceleration.	3
9.	**Experiment 9:** Friction and Newton's second law.	3
10.	**Experiment 10:** Ohm's Law.	3
11.	**Revision.**	1
	Total	**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Class Activities (class quizzes, homework, solving problems, etc.....)	weekly	10 %
2.	Laboratory	During the term	30 %
3.	Midterm Exam	8thweek	20 %
4.	Final Exam	16thweek	40 %

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

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	- Serway R.A. and Jewett J.W., ***Physics for Scientists and Engineers with Modern Physics,*** 9th Edition, Brooks/Cole, Belmont, CA, USA (2014).
Supportive References	- Halliday D. and Resnick R., ***Physics***, 9thEdition, John Wiley and sons (2011).
Electronic Materials	**https://units.imamu.edu.sa/colleges/en/science/Pages/default.aspx**
Other Learning Materials	- Laboratory Manual supplied by the Department of Physics. - Laboratory Manual is available at the website of the Department of Physics.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	- **Classrooms.** - **Labs.**
Technology equipment (projector, smart board, software)	- **Classroom equipped with a whiteboard and a projector.**
Other equipment (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 Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

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