Course Specification
(Bachelor)

Course Title: :	**General Physics**
Course Code:	**PHY 1101**
Program:	**Bachelor of Science in Physics.** **Bachelor of Science in Applied Mathematics.** **Bachelor of Science in Chemistry.** **Bachelor of Science in Biology**
Department:	**Physics**
College:	**Science**
Institution:	**Imam Mohammad Ibn Saud Islamic University**
Version:	4
Last Revision Date:	***29/09/2024***

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A. General information about the course:

1. Course Identification

1. Credit hours: (4)					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 1/ Year1)					
4. Course General Description:					
This course covers topics like kinematics and the study of work and energy and. Students will gain with a deep understanding of these concepts and topics. A laboratory portion of this course will provide hands-on experience with these topics.					
5. Pre-requirements for this course (if any)**:**					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					

- **Provide the basic concepts and build a strong foundation in the principles of classical mechanics.**
- **Analyze different physical situations and phenomena in terms of the fundamental laws of classical mechanics.**
- **Understand how these principles are applied in the world around us.**
- **Gain an understanding of the classical laws of physics and how they are applied to real world problems.**
- **Observe and analyze physical data relevant to some of the experiments in mechanics.**
- **Develop critical thinking and analytical problem-solving skills.**

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	90	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**	0
4.	**Tutorial**	30
5.	**Others (specify)**	0
Total		90

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	**Describe the concepts and principles in introductory dynamics in one and two dimensions.**	**K1, K2**	• Lectures. • Tutorials. • Class discussions.	▪ Exams. ▪ Participation. ▪ Discussions.
1.2	**Outline physical phenomena using Newton's laws of motion.**	**K1, K2**	• Lectures. • Tutorials. • Class discussions.	▪ Exams. ▪ Homework. ▪ Quizzes.
1.3	**Describe physical phenomena using energy and work concepts.**	**K1, K2**	• Lectures. • Class discussions. • Tutorials.	▪ Participation. ▪ Exams. ▪ Discussions. ▪ Homework.
2.0	**Skills**			
2.1	**Explain and summarize the basic knowledge gained from studying mechanics.**	**S1, S2**	• Lectures. • Class discussions. • Tutorials.	▪ Exams. ▪ Discussions. ▪ Participation.
2.2	**Explain and summarize the basic knowledge gained from studying mechanics.**	**S1, S2**	• Lectures. • Class discussions. • Tutorials.	▪ Exams. ▪ Discussions. ▪ Participation.
2.3	**Develop the students ability to solve and analyze problems in physics related the topics covered by the course.**	**S2, S3**	• Problem classes and group tutorial. • Homework assignments as well as problems solutions.	▪ Exams. ▪ Discussions. ▪ Homework.

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.4	**Explain and use information from the output of experiment to draw conclusions.**	**S2, S3**	• Experiments setting up, data recording and calculations based on lab manual and lectures (co-requisites).	▪ Compare with standard results. ▪ Feedback and explanations.
2.5	**Summarize conclusions and write reports.**	**S3, S4**	• Experiments setting up, data recording and calculations based on lab manual and lectures (co-requisites).	▪ Compare with standard results. ▪ Feedback and explanations.
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.**	**V1, V2, V3**	• Small team tasks • Open discussion at classroom. • Office hours.	▪ Participation. ▪ Homework. ▪ Mini-project(s).

C. Course Content

No	List of Topics	Contact Hours
1.	**Physics and Measurements:** Standards of length, mass, and time, dimensional analysis, conversion of units, estimates and order-of-magnitude calculations, significant figures.	**4**
2.	**Motion in One Dimension:** Displacement, velocity and acceleration, one dimensional motion with constant acceleration, freely falling objects.	**10**
3.	**Vectors:** Vector and scalar quantities, some properties of vectors, components of a vector and unit vectors.	**10**
4.	**Motion in Two Dimensions:** position vector, velocity vector, acceleration vector, two-dimensional motion with constant acceleration, projectile motion.	**12**
5.	**Newton's Laws of Motion:** The concept of force, Newton's first law, Newton's second law, the force of gravity and weight, Newton's third law, frictional force, some applications of Newton's laws.	**12**
6.	**Work and Energy:** Scalar product of two vectors, work done by a constant/variable force, kinetic energy and the work-kinetic energy theorem, potential energy, conservative and non-conservative forces, conservative forces and potential energy, conservation of mechanical energy, work done by non-conservative forces, power.	**12**

	List of Topics *(Laboratory)*	
1.	**Experiment 1:** Measurements and uncertainties. Virtual experience.	**3**
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**
Total		**90**

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**	**All the semester**	**30 %**
3.	**Midterm Exam 1**	**6thweek**	**10 %**
4.	**Midterm Exam 2**	**12thweek**	**10 %**
5.	**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 Reviewers, 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