Course Syllabus

1	**Course title**	General Physics-1	
2	**Course number**	0302101	
3	**Credit hours**	3 hours	
	Contact hours (theory, practical)	3 theory	
4	**Prerequisites/corequisites**	No prerequisites	
5	**Program title**	BSc. In Physics	
6	**Program code**	03	
7	**Awarding institution**	The University of Jordan	
8	**School**	Of science	
9	**Department**	Physics	
10	**Course level**	Undergrade	
11	**Year of study and semester(s)**	First year	
12	**Other department(s) involved in teaching the course**		
13	**Main teaching language**	English	
14	**Delivery method**	☒Face to face learning ☐Blended ☐Fully online	
15	**Online platforms(s)**	☒Moodle ☒Microsoft Teams ☐Skype ☐Zoom ☐Others…………	
16	**Issuing/Revision Date**	6/6/2024	

17 Course Coordinator:

Dr. Moneeb Shatanawi
Office hours: Announced on the website: eacademic.ju.edu.jo.
Office Tel.: 065355000 Ext.: 22040.
Email:

18 Other instructors:

Faculty Members of the Department of Physics.

19 Course Description:

Basic Principles of Mechanics: Motion in One Dimension, Vectors, Motion in Two Dimensions, The Laws of Motion, Circular Motion, Work and Kinetic Energy, Potential Energy and Conservation of Energy, Linear Momentum and Collisions, Rotation of a Rigid Object About a Fixed Axis, Angular Momentum.

20 Course aims and outcomes:

A- Aims:

1. To understand the fundamental concepts in physics.
2. To utilize physics concepts qualitatively as well as quantitatively.
3. To develop critical thinking and analytical problem-solving skills.
4. To gain an appreciation of how large a role physics plays in our daily life.

B- Students Learning Outcomes (SLOs):

For purposes of mapping the course SLOs to the physics program SLOs, at the successful completion of the physics program, graduates are expected to be able to:

SLO (1) Master professionally a broad set of knowledge concerning the fundamentals in the basic areas of physics: Quantum Mechanics, Classical Mechanics, Electrostatics and Magnetism, Thermal Physics, Optics, Theory of Special Relativity, Mathematical Physics, Electronics.

SLO (2) Apply knowledge of mathematics and fundamental concepts in the basic areas of physics to identify and solve physics related problems.

SLO (3) Utilize computers and available software in both data collections and data analysis.

SLO (4) Utilize standard laboratory equipment, modern instrumentation, and classical techniques to design and conduct experiments as well as to analyze and interpret data.

SLO (5) Develop a recognition of the need and ability to engage in life-long learning.

SLO (6) Demonstrate ability to use techniques, skills, and modern scientific tools necessary for professional practice.

SLO (7) Communicate clearly and effectively in both written and oral forms.

SLO (8) Apply proficiently team-work skills and employ team-based learning strategies.

SLO (9) Apply professional and ethical responsibility to society.

Upon successful completion of this course, students will be able to:

Program SLOs / Course SLOs	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)	SLO (7)	SLO (8)	SLO (9)
1. Use vectors in calculations.	✓	✓							
2. Explain and describe one-dimensional and two-dimensional motions.	✓	✓							

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3. Explain Newton's Laws of Motion and related applications.	✓	✓						
4. Understand the relationship of work, energy, and power.	✓	✓						
5. Use algebraic mathematics along with physical principles to effectively solve problems encountered in everyday life.	✓	✓						

21. Topic Outline and Schedule:

Week	Lecture	Topic	Intended Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	1.7 Vectors and Vector Addition	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	1.2	1.8 Components of Vectors	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	1.3	1.9 Unit Vectors	1, 2, 5	**Face to Face**			Discussion, Solving Suggested	Textbook

								Problems	
2	2.1	1.10 Products of Vectors	1, 2, 5	**Face to Face**				Discussion, Solving Suggested Problems	Textbook
	2.2	1.10 Products of Vectors	1, 2, 5	**Face to Face**				Discussion, Solving Suggested Problems	Textbook
	2.3	Problem Solving	1, 2, 5	**Face to Face**				Discussion, Solving Suggested Problems	Textbook
3	3.1	2.1 Displacement, Time, Average Velocity	1, 2, 5	**Face to Face**				Discussion, Solving Suggested Problems	Textbook
	3.2	2.2 Instantaneous Velocity	1, 2, 5	**Face to Face**				Discussion, Solving Suggested Problems	Textbook

	3.3	2.3 Average and Instantaneous Acceleration	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	4.1	2.4 Motion with Constant Acceleration	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
4	4.2	2.5 Freely Falling Bodies	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	4.3	2.6 Velocity and Position by Integration	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
5	5.1	3.1 Position and Velocity Vectors	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook

		3.2 The Acceleration Vector	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
	5.2								
	5.3	3.3 Projectile Motion	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
	6.1	3.4 Motion in a Circle	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
6	6.2	Motion in a Circle	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
	6.3	Problem Solving	1, 2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
7	7.1	4.1 Force and Interaction	1-2, 3, 5	**Face to Face**			Discussion, Solving	Textbook	

							Suggested Problems	
7.2		4.2 Newton's First Law	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
7.3		4.3 Newton's Second Law	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
8	8.1	4.4 Mass and Weight	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	8.2	4.5 Newton's Third Law	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	8.3	4.6 Free body Diagram	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested	Textbook

							Problems	
	9.1	13.1Newton's Law of Gravitation	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
9	9.2	13.2 Weight	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	9.3	Problem Solving	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
10	10.1	5.1 Using Newton's First Law: Particles in Equilibrium	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	10.2	5.2 Using Newton's Second Law: Dynamics of Particles	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook

		5.3 Frictional Forces	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
	10.3								
	11.1	5.4 Dynamics of Circular Motion	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
11	11.2	5.5 The Fundamental Forces of Nature	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
	11.3	Problem Solving	1-2, 3, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
12	12.1	6.1 Work	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
	12.2	6.2 Kinetic Energy and the	4, 5	**Face to Face**			Discussion, Solving	Textbook	

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		Work-Energy Theorem					Suggested Problems	
	12.3	6.3 Work and the Energy with Varying Force	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
13	13.1	6.4 Power	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	13.2	Problem Solving	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	13.3	Problem Solving	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
14	14.1	7.1 Gravitational Potential Energy	4, 5	**Face to Face**			Discussion, Solving Suggested	Textbook

							Problems	
	14.2	7.2 Elastic Potential Energy	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	14.3	7.3 Conservative and Non-Conservative Forces	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
15	15.1	7.4 Force and Potential Energy	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	15.2	Problem Solving	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	15.3	Problem Solving	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook

		8.1 Momentum and Impulse	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
16	16.1								
	16.2	8.2 Conservation of Momentum	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
	16.3	8.3 Momentum Conservation and Collisions	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
17	17.1	8.4 Elastic Collisions	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
	17.2	8.5 Center of Mass (No Integrals)	4, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
	17.3	Problem Solving	4, 5	**Face to Face**			Discussion, Solving	Textbook	

							Suggest ed Problem s	
18	18.1	9.1 Angular Velocity, and Acceleration	1,2, 5	**Face to Face**			Discussi on, Solving Suggest ed Problem s	Textbook
	18.2	9.2 Rotation with Constant Angular Acceleration	1,2, 5	**Face to Face**			Discussi on, Solving Suggest ed Problem s	Textbook
	18.3	9.3 Relating Linear and Angular Kinematics	1,2, 5	**Face to Face**			Discussi on, Solving Suggest ed Problem s	Textbook
19	19.1	9.4 Energy in Rotational Motion	1,2, 5	**Face to Face**			Discussi on, Solving Suggest ed Problem s	Textbook
	19.2	Problem Solving	1,2, 5	**Face to Face**			Discussi on, Solving Suggest ed	Textbook

						Problems	
	19.3	10.1 Torque	1,2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
20	20.1	10.2 Torque and Angular Acceleration for a Rigid Body	1,2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	20.2	10.4 Work and Power in Rotational Motion	1,2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
	20.3	10.5 Angular Momentum	1,2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook
21	21.1	10.6 Conservation of Angular Momentum	1,2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook

	21.2	10.1 Torque	1,2, 5	**Face to Face**			Discussion, Solving Suggested Problems	Textbook	
	21.3							Textbook	

22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
1st Exam	20%	Chapters 1, 2, and 3	1, 2	26/4/ 2024	Exam Builder
2nd Exam	30%	Chapters 4, 5, 13, 6 and 7	1, 2	21/5/ 2024	Exam Builder
Final Exam	50%		1, 2	13/6/2024	Exam Builder

23 Course Requirements

TextBook, Lecture Notes, Scientific Calculator

24 Course Policies:

A- Attendance policies:

Class attendance is mandatory.

A student whose absence exceeds 15% of lectures will be dismissed.

B- Absences from exams and handing in assignments on time:

Absence from exams without an acceptable excuse means ZERO.

No grades for homework assignments. Some suggested problems will be discussed in class for every chapter.

C- Health and safety procedures:

No special precautions.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

All these issues will be considered according to the regulations and laws adopted at the University of Jordan.

E- Grading policy + Weighting (i.e. weight assigned to exams as well as other student work)

First Exam: 20%

Second Exam: 30%

Final Exam: 50%

F- Available university services that support achievement in the course:

Class Room, Some Office Toys, Library

G- Statement on Students with disabilities

Students with disabilities who need special accommodations for this class are encouraged to meet with the instructor and/or their academic advisor as soon as possible. In order to receive accommodations for academic work in this course, students must inform the course instructor and/or their academic advisor, preferably in a written format, about their needs no later than the 4th week of classes.

25 References:

A- Required book (s), assigned reading and audio-visuals:

"University Physics with Modern Physics" F. Sears & M. Zemansky's, 14th edition, (Pearson, Pearson Education Limited, 2016).

B. Recommended books, materials, and media:

1. Raymond A. Serway and John W. Jewett Jr., "Physics For Scientists and Engineers with Modern Physics", 9th edition, (Thomson Learning, Belmont, CA, USA, 2014).

2. David Halliday, Robert Resnick, and Jearl Walker, "EXTENDED PRINCPLES OF PHYSICS", 9th Edition (John Wiley & Sons, Inc., 2011).

3. Bauer Westfall, "University Physics with Modern Physics", (McGraw Hill, 2011).

4. James S. Walker, "Physics" Fourth Edition, (Addison – Wesley, 2010).

5. Giancoli, "Physics for Scientists & Engineers with Modern Physics", Fourth Edition, (Pearson Education, 2009).

6. Ohanian and Market, "Physics for Engineers and Scientists", Extended Third Edition, (W. W. Norton & Company, 2007).

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26 Additional information:

Name of Course Coordinator: ---------------------------------Signature: ---------------------- Date: -------------------
Head of Curriculum Committee/Department: --------------------------- Signature: ---------------------------------
Head of Department: --- Signature: ----------------------------
Head of Curriculum Committee/Faculty: --------------------------------------- Signature: --------------------------------
Dean: --- Signature: ---