The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus
General Physics-1 (0302101)

1	Course title	**General Physics-1**
2	Course number	**0302101**
3	**Credit hours (theory, practical)**	**3 theory**
	Contact hours (theory, practical)	**3 theory**
4	Prerequisites/corequisites	**No prerequisites**
5	Program title	**BSc. In Physics**
6	Program code	
7	Awarding institution	**The University of Jordan**
8	Faculty	**Faculty of Science**
9	Department	**Department of Physics**
10	Level of course	**1st year**
11	Year of study and semester (s)	**1st Semester 2015/2016**
12	Final Qualification	**Bachelor**
13	Other department (s) involved in teaching the course	**-**
14	Language of Instruction	**English**
15	Date of production/revision	**September 2015/January 2016**

16. Course Coordinator:

Dr. Hanan Sa'adeh
Office hours: Announced on the website: eacademic.ju.edu.jo/hanan.saadeh/default.aspx
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17. Other instructors:

Faculty Members of the Department of Physics

18. 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.

19. Course aims and outcomes:

A- Aims:
1- Understanding the the fundamental concepts in physics.
2- Utilizing 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- Intended Learning Outcomes (ILOs):
Upon successful completion of this course students will be able to
1- Use vectors in calculations.
2- Explain and describe one-dimensional and two-dimensional motions.
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.
6- Apply knowledge of linear motion, forces, energy, circular motion, and conservation of energy and momentum to explain natural physical processes and related technological advances.

20. Topic Outline and Schedule:

Ch. #	Topics	# of hrs	Suggested Problems
2	**Motion in One Dimension** 2.1 Position, Velocity, and Speed 2.2 Instantaneous Velocity and Speed 2.4 Acceleration 2.5 Motion Diagrams 2.6 Analysis-Model: Particle Under Constant Acceleration 2.7 Freely Falling Objects 2.8 Kinematic Equations Derived from Calculus	4	1, 3, 4, 19, 21 28, 38, 51
3	**Vectors** 3.1 Coordinate Systems 3.2 Vector and Scalar Quantities 3.3 Some Properties of Vectors 3.4 Components of a Vector and Unit Vectors 7.3 The Scalar Product of Two Vectors 11.1 The Vector Product and Torque	3	3.4, 3.25, 3.32 7.5, 7.12, 7.13 11.1, 11.6, 11.10
4	**Motion in Two Dimensions** 4.1 The Position, Velocity, and Acceleration Vectors 4.2 Two-Dimensional Motion with Constant Acceleration 4.3 Projectile Motion 4.4 Uniform Circular Motion 4.5 Tangential and Radial Acceleration	4	1, 6, 20, 27, 40
5	**The Laws of Motion** 5.1 The Concept of Force 5.2 Newton's First Law and Inertial Frames 5.3 Mass 5.4 Newton's Second Law 5.5 The Gravitational Force and Weight 5.6 Newton's Third Law 5.7 Analysis Models Using Newton's Second Law 5.8 Forces of Friction	4	3, 18, 19, 32, 37 56, 61, 65
6	**Circular Motion and Other Applications of Newton's Laws** 6.1 Extending the Particle in Uniform Circular Motion Model 6.2 Non-uniform Circular Motion	2	1, 9, 19, 16, 54, 57

7	**Energy of a System** 7.1 Systems and Environment 7.2 Work Done by a Constant Force 7.4 Work Done by a Varying Force 7.5 Kinetic Energy and the Work-Kinetic Energy Theorem 7.6 Potential Energy of a System 7.7 Conservative and Non-Conservative forces 7.8 Relationship Between Conservative Forces and Potential Energy	3	5, 15, 17, 29, 43, 49
8	**Conservation of Energy** 8.1 Analysis Model: Non-isolated System (Energy) 8.2 Analysis Model: Isolated System (Energy) 8.3 Situations Involving Kinetic friction 8.4 Changes in Mechanical Energy for Non-Conservative Forces 8.5 Power	3	5, 6, 7, 22, 23, 63
9	**Linear Momentum and Collisions** 9.1 Linear Momentum 9.2 Analysis Model: Isolated System (Momentum) 9.3 Analysis Model: Non-Isolated System (Momentum) 9.4 Collisions in One Dimension 9.5 Collisions in Two Dimensions 9.6 The Center of Mass (No Integrals)	4	11, 13, 30, 33, 45 46, 48, 67
10	**Rotation of a Rigid Object about a Fixed Axis** 10.1 Angular Position, Velocity, and Acceleration 10.2 Analysis Model: Rigid Object Under Constant Angular Acceleration 10.3 Angular and Translational Quantities 10.4 Torque 10.5 Analysis Model: Rigid Object Under a Net Torque 10.7 Rotational Kinetic Energy 10.8 Energy Considerations in Rotational Motion	5	6, 19, 27, 30, 32 44, 45, 77
11	**Angular Momentum** 11.2 Analysis Model: Non-Isolated system (Angular Momentum) 11.3 Angular Momentum of a Rotating Rigid Object 11.4 Analysis Model: Isolated system (Angular Momentum)	3	11, 12, 18, 27, 45

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:
Lecturing
Solving Problems
Class Demonstrations

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:
Exams
Discussion in the class

23. 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:

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

24. Required equipment:

Text Book, Lecture Notes, Scientific Calculator.

25. References:

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

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

B- Recommended books, materials, and media:

1. F. Sears, M. Zemansky's "University Physics with Modern Physics", 13th Edition (Pearson, Addison Wesley, 2012).
2. David Halliday, Robert Resnick, and Jearl Walker, "EXTENDED PRINCPLES OF PHYSICS", 9 th 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).

26. Additional information:

Name of Course Coordinator: Dr. Hanan Sa'adeh Signature: ---------- Date: 14/1/2016

Head of curriculum committee/Department: ---------- Signature: ----------

Head of Department: ---------- Signature: ----------

Head of curriculum committee/Faculty: ---------- Signature: ----------

Dean: ---------- -Signature: ----------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File