Philadelphia University Faculty of Science Department of Scientific Basic Sciences	PHILADELPHIA UNIVERSITY THE WAY TO THE FUTURE	**Approval date:** **Issue:** **Credit hours**: 3
Academic year: 2025/2026	**Course Syllabus**	**Bachelor**

Course information

Course ID	Course title			Prerequisite
0216135	General Physics for health sciences			None
Course type	**Section**	**Instructor**	**Class time**	Room #
☐ University Requirement ☒ Faculty Requirement ☐ Major Requirement ☐Elective ☒Compulsory	1	Mustafa Al-Zyout	Sun. & Tue.: 09:45 – 10:35	61201
			Sun.: 21:10 – 22:00	online
	2	Mustafa Al-Zyout	Sat. & Mon.: 12:40 – 13:30	61202
			Sun.: 20:10 – 21:00	online

Instructor Information

Name	Office No.	Phone No.	Office Hours	E-mail
Mustafa Al-Zyout	819	06 4779000 ext.: 2341	Sat. & Mon.: 09:45 – 11:00 Sun. & Tues.: 12:30 – 13:30	mzyout@philadelphia.edu.jo

Course Delivery Method

Course Delivery Method			
☐ Physical	☐ Online	☒ Blended	
Learning Model			
Precentage	Synchronous	Asynchronous	Physical
		33 %	67 %

Course Description

This premedical general physics course introduces students to key mechanical concepts (force, gravitation, Newton's laws, elasticity, and fluid mechanics), temperature and gas laws, human metabolism, radiation, and temperature regulation in warm-blooded animals. It covers applications of physics in biology and medicine, including circulation, nerve cell structure, sound waves, optics (mirrors, lenses, eye defects), X-ray diffraction, and radioactivity. The course emphasizes medical applications, such as blood pressure measurement, centrifugation, electroencephalography, ultrasound, tomography, and radiation in medicine.

Course Learning Outcomes

Number	Outcomes	Corresponding Program outcomes
	Knowledge	
K1	Identify the base quantities in the SI system.	LO12 and LO14
K2	Describe the translational motion of a single particle in terms of position and inertial frames, inertia, velocity, acceleration; define work, energy, power, heat capacity, latent heat.	LO12 and LO14
K3	Identify some basic laws in physics in the areas of classical mechanics and thermodynamics; including: The laws of motion, The law of conservation of energy, The ideal gas law, and The laws of thermodynamics, Coulomb's law in electrostatics, Equations and principles of fluids, Ray optics, and more.	LO12 and LO14
	Skills	
S1	Apply basic mathematical tools commonly used in physics; including: basic algebra, vector algebra, differentiation and integration.	LO12 and LO14

S2	Calculate velocity, acceleration, work, energy, power, elastic constants of solids, Temperature, heat capacity, latent heat, pressure, thermal energy, electric forces and electric filed Potential, continuity equation, and more.	LO12 and LO14
S3	Apply some basic laws in physics in the areas of classical mechanics and thermodynamics; including: The laws of motion, The law of conservation of energy, The ideal gas law, The laws of thermodynamics, Mechanics of fluids, Light and geometrical optics.	LO12 and LO14
S4	Convert a temperature between any two temperature scales, including the Celsius, Fahrenheit, and Kelvin scales.	LO12 and LO14
S5	Apply the relationship between the temperature change and the length change, the area change or the volume change.	LO12 and LO14
S6	Apply the equation that relates stress to strain and elastic modulus.	LO12 and LO14
S7	Apply the equations and principles that control fluid mechanics.	LO12 and LO14
S8	Apply basic laws in physics in the area of light and geometrical optics.	LO12 and LO14
Competencies		
C1	Draw a vector, a free body diagram, a p-v diagram, Ray optics, Diffraction and reflection patterns, and more …	LO12 and LO14
C2	Convert a physical situation articulated in English to a mathematical formulation, and then analyzes it quantitatively.	LO12 and LO14
C3	Extend the basics of mechanics to thermodynamics and fluids mechanics.	LO12 and LO14
C4	Explain the importance of the application of physics in science, pharmacy and medicine.	LO12 and LO14
C5	Build a solid background for other studies related to physics or natural sciences.	LO12 and LO14

Learning Resources

Course textbook	D. Halliday, R. Resnick and *Jearl* Walker, Fundamentals of Physics, John Wiley and Sons (WIE); 10th edition , 2013.
Supporting References	Raymond A. Serway and John W. Jewett, Physics for Scientists and Engineers, Cengage Learning; 9th Edition, 2014.
	Roger A. Freedman and , Hugh D. Young, University Physics With Modern Physics, Pearson, ; 14th edition , 2015.
	John D. Cutnell and Kenneth W. Johnson, Physics 9e, John Wiley and Sons (WIE), 9 edition, 2012.
	Randall D. Knight , Physics for Scientists and Engineers: A Strategic Approach with Modern Physics, , Pearson, 2nd edition, 2007.
	Joseph W. Kane, and Morton M. Sternheim, Physics, John Wiley and Sons (WIE), 2nd edition, 1988.
Supporting websites	http://www.ux1.eiu.edu/~cfadd/1150/Hmwk/Ch02/Ch02.html
	http://faculty.etsu.edu/lutter/courses/phys2010/index.htm
	http://www.physics.umd.edu/courses/Phys121/Roberts/F06/lecture_notes.htm
	http://romano.physics.wisc.edu/winokur/phys207/
	http://www.sfu.ca/phys/100/
	http://theory.uwinnipeg.ca/physics/
	https://ocw.mit.edu/courses/physics/8-01-physics-i-fall-2003/
Teaching Environment	☒Classroom ☐ laboratory ☐Learning platform ☐Other

Meetings and subjects timetable

Week	Topic	Learning Methods	Tasks	Learning Material
1	Motion In a Straight Line 1.1 Units 1.2 Displacement, Average Velocity 1.3 Instantaneous Velocity 1.4 Acceleration	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.03

2	**motion in two dimensions** 2.1 An Introduction to Vectors	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.02
3	**Newton's Laws of Motion** 3.1 Force, Weight, and Gravitational mass 3.2 Density 3.3 Newton's first law 3.4 Equilibrium 3.5 Newton's third law 3.6 Newton's Second Law 3.7 The Significance of Newton's Laws of motion 3.8 Some examples of Newton's laws 3.9 Gravitational Forces 3.10 Weight 3.11 Effective Weight 3.12 Friction	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.05
4	**Static** 4.1 Torques 4.2 Equilibrium of rigid bodies 4.3 Center of gravity 4.5 Levers; Mechanical advantage 4.10 Pulley Systems	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.06
5	**Circular Motion:** 5.1 Centripetal Acceleration 5.3 Angular Variables 5.4 Torque, Angular Acceleration, and the Moment of Inertia	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.07 + Ch.08
6	**Work, Energy, And Power** 6.1 work 6.2 kinetic energy 6.3 potential Energy and Conservative Forces 6.4 Dissipative Forces 6.6 Solving Problems Using Work and Energy 6.9 Power	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.12
8	**Elastic Properties of Materials** 8.1 General Aspects of stress and strain 8.2 Young's Modulus 8.3 Bending Strength 8.4 Buckling Strength and Structural Design in Nature 8.5 Shearing and Twisting Torques	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.18
9	**Heat** 10.1 Temperature scales 10.3 Pressure	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.18
9	**Thermodynamics** 11.1 Mechanical Work 11.2 The First law of Thermodynamics 11.3 The second Law of Thermodynamics	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.19
10	**Thermal properties of Matter** 12.1 Thermal Expansion 12.2 Heat Capacity 12.3 Phase changes	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.19

	12.4 Heat Conduction 12.5 Heat Transfer by convection 12.6 Radiation			
11	The Mechanics of Nonviscous 13.1 Archimedes' Principle 13.2 Equation of Continuity; Streamline Flow 13.3 Bernoulli's Equation 13.4 Static Consequences of Bernoulli's Equation. 13.7 Dynamic Consequences of Bernoulli's Equation	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.20
12	Viscous Fluid flow 14.1 Viscosity 14.5 Viscous Drag Forces	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.21
13	Electric Forces, Fields, and Potential 16.1 Electric Forces 16.2 The electric Filed 16.4 The electric Potential	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.22
13	Direct Current 17.1 Electric Current 17.2 Resistance. 19.1 Magnetic Field	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.14
14	The description of wave motion 21.1 The Representation of Waves 21.2 The velocity of Waves	Lecture, problem solving based learning, collaborative learning	Quiz Homework	Ch.34
15	Sound 22.1 The nature and speed of sound 22.3 The Intensity of sound waves 22.6 Auditory response	Lecture, problem solving based learning, collaborative learning	Quiz Homework	
15	Nuclear Physics 30.1 Radioactivity	Lecture, problem solving based learning, collaborative learning	Quiz Homework	
16	Final Exam			

Course Contributing to Learner Skill Development

Using Technology
By the end of the course, students should be able to: • use computational software to organize, condition and present experimental data. • solve systems of equations (e.g., projectile motion) using computational software.
Communication skills
By the end of the course, students should be able to: • Giving seminars on physics topics • Teaching basic physics ideas • Preparing technical reports

Assessment Methods and Grade Distribution

Assessment Methods	Grade Weight	Assessment Time (Week No.)	Link to Course Outcomes
Mid Term Exam	30%	8	
Various Assessments *	30%	4-13	
Final Exam	40%	16	
Total	100%		

Alignment of Course Outcomes with Learning and Assessment Methods

Number	Learning Outcomes	Learning Method*	Assessment Method**
Knowledge			
K1	Identify the base quantities in the SI system.	lectures	• Quiz • Exam
K2	Describe the translational motion of a single particle in terms of position and inertial frames, inertia, velocity, acceleration; define work, energy, power, heat capacity, latent heat.	lectures	• Quiz • Exam
K3	Identify some basic laws in physics in the areas of classical mechanics and thermodynamics; including: The laws of motion, The law of conservation of energy, The ideal gas law, and The laws of thermodynamics, Coulomb's law in electrostatics, Equations and principles of fluids, Ray optics, and more.	lectures	• Quiz • Exam
Skills			
S1	Apply basic mathematical tools commonly used in physics; including: basic algebra, vector algebra, differentiation and integration.	lectures	• Quiz • Exam
S2	Calculate velocity, acceleration, work, energy, power, elastic constants of solids, Temperature, heat capacity, latent heat, pressure, thermal energy, electric forces and electric filed Potential, continuity equation, and more.	lectures	• Quiz • Exam
S3	Apply some basic laws in physics in the areas of classical mechanics and thermodynamics; including: The laws of motion, The law of conservation of energy, The ideal gas law, The laws of thermodynamics, Mechanics of fluids, Light and geometrical optics.	lectures	• Quiz • Exam
S4	Convert a temperature between any two temperature scales, including the Celsius, Fahrenheit, and Kelvin scales.	lectures	• Quiz • Exam
S5	Apply the relationship between the temperature change and the length change, the area change or the volume change.	lectures	• Quiz • Exam
S6	Apply the equation that relates stress to strain and elastic modulus.	lectures	• Quiz • Exam
S7	Apply the equations and principles that control fluid mechanics.	lectures	• Quiz • Exam
S8	Apply basic laws in physics in the area of light and geometrical optics.	lectures	• Quiz • Exam
Competencies			
C1	Draw a vector, a free body diagram, a p-v diagram, Ray optics, Diffraction and reflection patterns, and more …	lectures	• Quiz • Exam

C2	Convert a physical situation articulated in English to a mathematical formulation, and then analyzes it quantitatively.	lectures	• Quiz • Exam
C3	Extend the basics of mechanics to thermodynamics and fluids mechanics.	lectures	• Quiz • Exam
C4	Explain the importance of the application of physics in science, pharmacy and medicine.	lectures	• Quiz • Exam
C5	Build a solid background for other studies related to physics or natural sciences.	lectures	• Quiz • Exam

Course Polices

Policy	Policy Requirements
Passing Grade	The minimum passing grade for the course is (50%) and the minimum final mark recorded on transcript is (35%).
Missing Exams	• Missing an exam without a valid excuse will result in a zero grade to be assigned to the exam or assessment. • A Student who misses an exam or scheduled assessment, for a legitimate reason, must submit an official written excuse within a week from the an exam or assessment due date. • A student who has an excuse for missing a final exam should submit the excuse to the dean within three days of the missed exam date.
Attendance	The student is not allowed to be absent more than (15%) of the total hours prescribed for the course, which equates to six lectures days (M, W) and seven lectures (S,T,R). If the student misses more than (15%) of the total hours prescribed for the course without a satisfactory excuse accepted by the dean of the faculty, s/he will be prohibited from taking the final exam and the grade in that course is considered (zero), but if the absence is due to illness or a compulsive excuse accepted by the dean of the college, then withdrawal grade will be recorded.
Academic Honesty	Philadelphia University pays special attention to the issue of academic integrity, and the penalties stipulated in the university's instructions are applied to those who are proven to have committed an act that violates academic integrity, such as: cheating, plagiarism (academic theft), collusion, and violating intellectual property rights.

Program Learning Outcomes to be Assessed in this Course

Number	Learning Outcome	Course Title	Assessment Method	Target Performance level
1	LO12	G. physics for health sciences	Exam	80% of students score 70% or higher on the performance assessment scale.
2	LO14	G. physics for health sciences	Exam	80% of students score 70% or higher on the performance assessment scale.

Description of Program Learning Outcome Assessment Method

Number	Detailed Description of Assessment
LO12	A Multiple-choice assessment within the final exam
LO14	A Multiple-choice assessment within the final exam

Rubric to Assess Term Paper			
Grading Scale / Indicators			
Assessment Dimensions 100 %	**Exemplary 8 → 10**	**Satisfactory 6 →Less than 8**	**Unsatisfactory 4 →Less than 6**
Aims & Purpose 10 %	• Covers a significant contemporary topic that is much related to the course outcomes. • Employs an original approach to study the selected topic.	• Covers a topic that is much related to the course outcomes. • Employs a logical approach to study the selected topic.	• Purpose of term paper is not clear. • A poor approach is used to study the selected topic.
Completeness 30 %	• All required elements and components of term paper (Abstract, Introduction, Main Body, Conclusions,	• All required elements and components of term paper (Abstract, Introduction, Main	• Some required elements are missing.

	and Resources) are evidently addressed and included. • All issues related to the topic are noticeably addressed, and outlined.	Body, Conclusions, and Resources) are included. • All issues related to the topic are discussed.	• Not all issues related to the topic are discussed
Content & Organization 25 %	• Sections are well organized and clearly presented. • Sections and sequenced concepts are creatively and logically ordered, with clear transition sentences. • Presentation of the term paper elements shows an accurate and through understanding of all aspects of the chosen topic. • Reveals the student ability to powerfully use Technology in preparing written document.	• Sections are organized and clearly presented. • Sections are logically ordered. • Presentation of the elements of term paper shows an understanding of all aspects of the chosen topic. • Reveals the student ability to use Technology in preparing written document.	• Sections are poorly organized • Sections are illogically ordered. • Presentation of the elements of term paper shows that student has gained the minimum understanding of the basic aspects of the selected topic • Provides no evidence for familiarity with using Technology in preparing written document
Writing Quality 10 %	• Almost entirely free of spelling, punctuation, and grammatical errors. • Sections are well written with strong sentence structure. • Ideas and concepts are presented in a coherent and clear manner.	• A few spelling, punctuation, and grammatical errors are detected. • Sections are clearly written with good sentence structure. • Ideas and concepts are presented in a clear manner.	• Several spelling, punctuation, and grammatical errors are detected. • Sections are unclearly written with weak sentence structure.
Resources 10 %	• Good quality significant recourses are effectively utilized in writing the Term Paper. • Resources are clearly and correctly listed and cited.	• Some of the recourses utilized in writing the Term Paper are significant. • Resources are clearly and correctly listed and cited.	• Most of the recourses utilized in writing the Term Paper are insignificant. • Resources are incorrectly listed and cited.
Overall Layout 10 %	• Gives clear evidence of the excellent effort put in preparing the Term Paper. • Reveals the writer ability to powerfully use Technology in preparing written document. • Has attractive visual appeal.	• Gives evidence of the effort put in preparing the Term Paper. • Reveals the writer ability to use Technology in preparing written document	• Shows no evidence for the effort put in preparing the Term Paper. • Provides no evidence for familiarity with using Technology in preparing written document.