PHY 236 Physics for Science and Engineering

Summer 2024

Course Credits: 4
Contact Hours: 56 hours
Instructor: TBA
Email:TBA

COURSE OBJECTIVES

This course is designed to enhance the amalgamation of physics with calculus, engineering, and chemistry. This course offers an in-depth exploration of advanced topics in modern physics, covering special relativity, elementary quantum mechanics, and atomic structure. The primary objective is to foster a strong foundational grasp of these principles and their extensive utilization across various scientific and engineering domains.

Upon Completion of this Course, students will be able to:

1. Understand and apply the principles of special relativity;
2. Describe the basic concepts of elementary quantum mechanics;
3. Analyze the structure of atoms and its significance in modern physics;
4. Integrate physics concepts with calculus, engineering, and chemistry;
5. Apply problem-solving skills to solve physics-related problems in various contexts.

PREREQUISITES

MAT 222 Multivariable Calculus

GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM	POINTS

Quizzes	20 Points
Midterm 1	15 Points
Midterm 2	15 Points
Project	20 Points
Final Exam	30 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F$.

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

Douglas C. Giancoli, ***Physics for Scientists & Engineers*****,** 5th Edition, Pearson, 2022.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Introduction, Measurement, Estimating Topic 2: Describing Motion: Kinematics in One Dimension Topic 3: Kinematics in Two or Three Dimensions; Vectors Topic 4: Dynamics: Newton's Laws of Motion Assessments: Quiz#1
Module 2	Topics: Topic 5: Using Newton's Laws: Friction, Circular Motion, Drag Forces Topic 6: Gravitation and Newton's Synthesis Topic 7: Work and Energy Topic 8: Conservation of Energy Assessments: Quiz#2 Project

Module 3	Topics: Topic 9: Linear Momentum Topic 10: Rotational Motion Topic 11: Angular Momentum; General Rotation Topic 12: Static Equilibrium; Elasticity and Fracture Assessments: Midterm#1 Project
Module 4	Topics: Topic 13: Fluids Topic 14: Oscillations Topic 15: Wave Motion Topic 16: Sound Assessments: Midterm#2 Project due
Module 5	Topics: Topic 17: Temperature, Thermal Expansion, and the Ideal Gas Law Topic 18: Kinetic Theory of Gases Topic 19: Heat and the First Law of Thermodynamics Topic 20: Second Law of Thermodynamics Assessments: Final Exam

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

1) Late assignments are not acceptable and are subjected to grade deductions.
2) Assignments submitted in the wrong format will be counted as not submitted.
3) Failure to submit or fulfill any required course component results in failure of the class.
4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACEDEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a

learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.