PHYS 0174: Physics for Science and Engineering 1

Spring, 2025-2026

INSTRUCTOR: Peng ZENG

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OFFICE HOURS: Mon. 13:00-15:00, Thu. 13:00-15:00 or upon appointment

LECTURES: **Section 1:**
16:45-18:25 Mon. Room 210, SCUPI Building, South Jiang'an Campus;
16:45-18:25 Wed. Room 210, SCUPI Building, South Jiang'an Campus.

TEXTBOOK: Principles of Physics*, 12th Edition, International Adaption, Jearl Walker, 2023, John Wiley & Sons

BLACKBOARD: Please regularly log on and check https://learn.scupi.cn/.
Lecture notes, online quizzes, assignments, announcements, and your grades will be uploaded on the PHYS 0174 page of the Blackboard.

PREREQUISITE: Students are assumed to have a basic understanding of the principles and practices of Senior Secondary Physics and concurrently taking Calculus I.

DESCRIPTION:
Science and engineering are based on proper and accurate descriptions which can be called physics. This course aims to prepare students for further study in their majors. The course provides a conceptually based exposure to the fundamental principles, comprehensive knowledge and a sound understanding of physics together with a physicist's analytical, mathematical, and practical skills. The main topic of this semester will cover Newton's mechanics, including motion, forces, kinetics, gravitation and waves. Students cultivate their understanding of physics through classroom study, in-class activity, and hands-on, inquiry-based laboratory work as they explore concepts. With concurrently Calculus course students are undertaking, this course will also conduct calculus-based mathematical methods of classical mechanics. At the completion of this course, students will find some ideas in solving practical problems using calculus and algebra, as well as ways describing the real physical world more quantitatively and rigorously.

COURSE OBJECTIVES:

At the completion and upon the requirements of this course, students will:

1) Demonstrate knowledge of the fundamental physical laws of mechanics.

2) Demonstrate the ability to use appropriate mathematical techniques and concepts to obtain quantitative solutions to problems in physics.

3) Apply the fundamental laws of mechanics to solve various practical problems.

4) Apply physical laws of dynamics involving gravitation.

5) Analyze the properties of translational and rotational motion.

6) Employ Newton's equations and conservation laws.

7) Analyze the dynamics of waves and oscillations.

GRADE DETERMINATION:

The final grade will be computed according to the following scheme:

Scheme:

Total grade = 10 % Assignments + 25 % Quizzes + 25 % Midterm Exam + 30 % Final Exam + 10 % Class Activities and Attendance.

Note:

All tests and final exam will be closed-book.

Conversion of numerical grades to final letter grades follows the SCUPI common grade:

A [90, 100] A- [85, 90) B+ [80, 85) B [76, 80) B- [73, 76) C+ [70, 73) C [66, 70) C- [63, 66) D+ [61, 63) D [60, 61) F (60, 0)

EXAMS:

There is one midterm exam scheduled in week 9, and one final exam during the final exam week. The midterm exam will be based on material taught until the second week before the test and **the final exam will cover all topics taught in this semester.**

All exams are mandatory. There will be absolutely no makeup exam. If you miss the final, a makeup exam may be given for the final exam if the student has the approval from the instructor or emergencies and health issues with a valid proof. I will not accept the student deceleration for absence form for the final exam.

The makeup exam for the final exam would be run at the beginning of next semester and the grading will follow SCUPI common grade.

QUIZZES:

Quizzes will be given in classes irregularly. Normally, a quiz will consist of a couple of short questions.

HOMEWORK:

All assignments are accepted only in paper form.

Each assignment should be submitted in person before the next class begins.

Students should start their homework assignments immediately after the assignments are given, and DO NOT wait until the last minute to meet the deadlines. Late assignments will be NOT accepted except for emergencies and health issues. Any other late assignments handed in will be

marked but will be given 0. At most two extensions for assignments will be given in this course. All assignments will be counted in your total grade. Late submission for previous assignments during the final exam period will NOT be accepted in any form for any excuses.

ATTENDANCE:
Attendance is expected in all lectures. Valid excuses for absence will be accepted before class. In extenuating circumstances, valid excuses with proof will be accepted after class.

OTHER COURSE POLICIES:
There will be no special treatments for any students in this course.

During Class: Computers may be allowed in class for the electronic recording of notes. But please refrain from using computers for any activities that are unrelated to the course. Phones are prohibited as they are rarely useful for anything in the course. Eating and drinking are allowed in class but please keep from it affecting the course.

Academic Integrity: At Sichuan University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all the work you do. Everyone at SCUPI is expected to treat others with dignity and respect. The Code of Student Conduct allows Sichuan University to take disciplinary action if students don't follow this community expectation

APPROXIMATE SCHEDULE:
The schedule is tentative and subject to change. The sequence of the sections covered in this class is:

Week	Contents	Descriptions
1 (03/09)	Chap 1	Measurement & Motion
2 (03/16)	Chaps 2 & 3	Vectors
3 (03/23)	Chap 4	Motion in two- and Three-Dimensions **In-class Tutorial**
4 (03/30)	Chap 5	Force and Motion I
5 (04/06)	Chap 6	Force and Motion II **In-class Tutorial**
6 (04/13)	Chaps 7	Work and Energy
7 (04/20)	Chap 8	Conservation of Energy and Momentum
8 (04/27)	Chap 9	Centre of Mass and Linear Momentum **In-class Tutorial**
9 (05/04)	Chap 10 **Midterm**	Rotation
10 (05/11)	Chap 11	Angular Momentum and Torque I
11 (05/18)	Chap 11	Angular Momentum and Torque II
12 (05/25)	Chap 13	Conservation of Angular Momentum **In-class Tutorial**
13 (06/01)	Chap 13	Oscillations I
14 (06/08)	Chap 15	Oscillations II
15 (06/15)	Chap 16	Wave I
16 (06/22)	Chap 17	Wave II **In-class Tutorial**