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Hunan University

PHYS 11: Introduction to Physics

Professor: To be announced
Total contact hours: 54 hours
Credit: 4

Course Description

This course aims to provide students with fundamental knowledge in physics, introducing students to mechanics, the quantitative description of the phenomena of motion and the mechanical properties of materials. It covers the key topics including planetary motion and Newton's Law of Universal Gravitation, Angular Velocity and Acceleration, Kinetic and Potential Energy, forces, momentum and Impulse, elastic and inelastic collisions, rotational motion, equilibrium, rotational inertia and conservation of momentum, solids and fluids and fluids dynamics and the Bernoulli's Equation, etc.
Prerequisites: This course requires no prior knowledge of physics.

Note: Be well prepared for the lab sections according to the professor's instructions.

Required Material

Textbook: The Physics of Everyday Phenomena: A Conceptual Introduction to Physics
Edition: 8th edition (2014)
Author: W. Thomas Griffith and Juliet Brosing
Publisher: McGraw-Hill
ISBN 978-0073513904

Grading

- Attendance 10%
- Homework 20%
- Lab 20%
- Midterm 20%
- Final Exam 30%

A+ 96-100	A 90-95	A- 85-89
B+ 82-84	B 78-81	B- 75-77
C+ 71-74	C 66-70	C- 62-65
D 60-61	F < 60	

Course Schedule

The course has 24 class sessions in total. All sessions are 2 hours and 15 minutes in length.
Note: the syllabus is subject to change.

Topic in Class 1:
Introduction to Mechanics
Measurements and Vectors
Reading: Chapter 1

Topic in Class 2:
Describing Motion in One and Two Dimensions
Reading: Chapter 2

Topic in Class 3:
Falling Objects and Projectile Motion
Reading: Chapter 3

Topic in Class 4:
Lecture: Introduction to Classical Mechanics
Reading: Chapter 4

Topic in Class 5:
Lab: Measurements and Uncertainty (Pre-Lab)
Vectors: Equilibrium of a Particle

Topic in Class 6:
Lecture: Applications of Newton's Laws
Reading: Chapter 4

Topic in Class 7:
Lecture: Circular Motion, Angular Velocity and Acceleration
Reading: Chapter 5

Topic in Class 8:
Lecture: Planetary Motion and Newton's Law of Universal Gravitation
Reading: Chapter 5

Topic in Class 9:
Lecture: Work and Energy
Kinetic and Potential Energy
Reading: Chapter 6

Topic in Class 10:
Lab: Atwood's Machine (Pre-Lab)
Centripetal Force Apparatus

Topic in Class 11:
Lecture: Conservative and Non-conservative Forces
Reading: Chapter 6
Midterm

Topic in Class 12:
Lecture: Review session for the Mid-Term Exam
Reading: Chapters 1-6

Topic in Class 13:
Mid Exam
Reading: Chapters 1 to 6(review)

Topic in Class 14:
Lecture: Momentum and Impulse
Reading: Chapter 7

Topic in Class 15:
Lab: Conservation of Mechanical Energy (Pre-Lab)
Linear Momentum

Topic in Class 16:
Lecture: Elastic and Inelastic Collisions
Reading: Chapter 7

Topic in Class 17:
Lecture: Rotational Motion
Reading: Chapter 8

Topic in Class 18:
Lecture: Objects in Equilibrium
Torque, Balance, and Center of Gravity
Reading: Chapter 8

Topic in Class 19:
Lecture: Rotational Inertia and Conservation of Momentum
Reading: Chapter 8

Topic in Class 20:
Lab: Elasticity and Simple Harmonic Motion (Pre-Lab)
Harmonic Oscillator: Physical Pendulum

Topic in Class 21:
Lecture 16: Solids and Fluids
States of Matter, Density, and Pressure
Reading: Chapter 9

Topic in Class 22:
Lecture 17: Fluids Dynamics and the Bernoulli's Equation
Reading: Chapter 9

Topic in Class 23
Lab 5: Archimedes' Principle (Pre-Lab)
Buoyancy and Boyle's Law
Overall review

Arrangement in Class 24:
Final Exam

Lab Arrangement

Room: To be announced
Hour: 18: 00 – 20:00

The lab reports have three parts, the pre-lab (to be completed on-line before the lab commences), the data and calculations and the post-lab. The pre-Lab Assignment due when you enter the lab. You and your partner will work collaboratively on the data and post-lab sections and hand in one report for the two of you.

In order to do a good job in the experiments, it is essential that you come well prepared. Reading the experiment for the first time in lab will put you and your partner at a disadvantage and make it very difficult to complete the experiment on time.

If you have any technical questions on the pre-lab, data section or post-lab assignments, you are encouraged to ask the professor.

Lab 1: Force & Acceleration
Lab 2: Friction
Lab 3: Angular Momentum
Lab 4: Free Fall & Pendulum
Lab 5: Fluids

Attending Policy

Regular and prompt attendance is required. Under ordinary circumstances, you may miss two times without penalty. Each absence over this number will lower your course grade by a third of a letter and missing more than five classes may lead to a failing grade in the course. Arriving late and/or leaving before the end of the class period are equivalent to absences.

Policy on "Late Withdrawals"

In accordance with university policy, appeals for late withdrawal will be approved ONLY in case of medical emergency and similar crises.

Academic Honesty

Hunan University expects all students to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating, and will also report the student's name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

General Expectations:

Students are expected to:

— Attend all classes and be responsible for all materials covered in class and otherwise assigned;

— Complete the day's required reading and assignments before class;

— Review the previous day's notes before class and make notes about questions you have about the previous class or the day's reading;

— Participate in class discussions and complete required written work on time;

— Refrain from texting, phoning or engaging in computer activities unrelated to class during the class period;

— While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.

Special Needs or Assistance

Please contact the 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. Our goal is to help you learn, not to penalize you for issues which mask your learning.