



University of International Business and Economics

International Summer School 2017

PHY 110 Introduction to Physics

Term: July 10 – August 4, 2017

Instructor: Assoc. Prof. Mike Bisset

Home Institution: Tsinghua University

Email: bisset@mail.tsinghua.edu.cn

Class Hours: Monday through Friday, 120 minutes each day

Office Hours: To be determined

Teaching Assistant: TBD

Discussion session: TBD

Course Description

A algebra-based (non-calculus) introduction to Physics designed for students not in the physical sciences. No previous course-work in physics is assumed. The goal is, in addition to having students learn to solve physics problems, to provide students with an overview of how the material taught fits together within a single conceptual framework.

The material to be covered is basically the first half of a standard College Physics course, with the broad subjects of electricity & magnetism, relativity, and quantum physics NOT covered (they are relegated to a second semester course). This is an intensive course, especially given the limited time frame, and students should take this into account.

Required Text

College Physics 10th Edition by Ray Serway & Chris Vuille

We will cover the first half of this textbook.

Attendance

The attendance of every student at **all** class sessions is mandatory. There will be limited exceptions based on formal written permission of the professor.

Grading Policy

Grades will be determined as follows:

- ✧ 15 percent for homework solutions



- ✧ 35 percent for the midterm exam
- ✧ 50 percent for the final exam

A	90-100
A–	85-89
B+	82-84
B	78-81
B–	75-77
C+	72-74
C	68-71
C–	64-67
D	60-63
F	below 60

Course Hours

The course has 20 class sessions in total. Each class session is 120 minutes in length for a total of 2,400 minutes of class time. The course meets from Monday to Friday.

Class Rules

Any academic misconduct of any type, especially cheating on an exam, will automatically trigger: (1) expulsion from the course; (2) the issuance of a failing grade for the course, (3) the issuance of a formal report about the student's misconduct to the student's home university, and (4) any other disciplinary or administrative action deemed appropriate by Professor Bisset and the leaders of UIBE. Students are allowed to co-operate on, but not copy, homework exercises.

Course Schedule

NOTE: the actual pace may vary somewhat from that indicated on this schedule. Instructor will try to maintain this schedule, but not at the expense of providing students with accurate explanations. "Fill-in" times listed are meant to help compensate for when lectures may fall behind schedule.

M1 Chapter 1 Physics and Measurement

What is physics, measurement, significant figures, Dimensions, units, dimensional analysis

Tu1 Chapters 2&3 Motion

Speed, velocity, acceleration, projectile motion, relative velocities

W1 Chapter 4 The Laws of Motion

Newton's Laws, inertial frames, friction, drag forces



Th1 Chapter 5 Energy and Energy Conservation

Work, Work-Energy Theorem, Potential Energy

F1 Chapter 6 Collisions

Momentum, collisions, center of mass, rocket problems

M2 Chapter 7 Rotational Motion

Angular kinematics, torque, rotational kinetic energy, moment of inertia, rolling, Angular momentum

Tu2 Chapter 7 Gravity

Universal Law, Kepler's Laws, free fall, satellites, equivalence principle

W2 Chapter 8 Rotational Motion

Angular kinematics, torque, rotational kinetic energy, moment of inertia, rolling, Angular momentum

Th2 Chapter 9 Fluids & Solids

Pressure, Buoyancy, Bernoulli's Law, laminar flow, turbulence, surface tension, deformation

F2 Review and fill-in time

M3 Midterm Examination Chapters 1-9

Tu3 Chapter 10 Thermal Physics

temperature ideal gases

W3 Chapter 11 Thermal Processes

thermodynamic processes, heat capacity, changes in phase

Th3 Chapter 12 Laws of Thermodynamics

2nd Law of Thermodynamics, heat engines, entropy, Carnot cycle

F3 Chapter 13 Wave Motion ,

Harmonic motion, pendulum, physical pendulum, damping, resonance, traveling waves

M4 Chapter 14 Sound Waves

Harmonics, Musical instruments

Tu4 Chapter 18 Superposition and Standing Waves

Harmonics, Musical instruments

W4 Chapter 19

Th4 review session

F4 Final Exam