



**University of International Business and Economics  
International Summer School**

**PHY 170 Introductory Physics I (with lab)**

**Term: June 13th – July 14th, 2022**

**Instructor: Prof. Shanshan Chen**

**Home Institution: Renmin University of China**

**Email: schen@ruc.edu.cn**

**Class Hours: Monday through Thursday, 120 minutes each day (2,400 minutes in total)**

**Discussion session: 2 hours each week**

**Office Hours: TBD**

**Total Contact Hours: 64 contact hours (45 minutes each, 48 hours in total)**

**Location: WEB**

**Credit: 4 units**

**Course Description:**

Calculus-based introduction to Physics designed for students not in the physical sciences. The material to be covered is basically the first half of a standard College Physics course, Mechanics and thermal dynamics. This is an intensive course, especially given the limited time frame, and students should take this into account.

**Course Goals:**

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.

**Required Textbook:**

Fundamentals of Physics, Volume 1, 10th Edition by David Halliday, Robert Resnick, Jearl Walker  
ISBN: 9781118230725

**Grading Policy:**

The grades will be determined as follows:

- 30% for homework solutions
- 20% for laboratory
- 20% for the midterm exam
- 30% for the final exam

**Grading Scale:**

Assignments and examinations will be graded according to the following grade scale:

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

### Academic Honesty:

Students are expected to maintain high standards of academic honesty. The work you produce in this class should be the product of your own time in reading, thinking, and writing. 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 Chen and the leaders of UIBE. Students are allowed to co-operate on, but not copy, homework exercises.

### Deadline Policy:

Summer school is very intense and to best ensure your success in this class, students must be proactive in their work. This means that you should not only be disciplined about completing assigned reading and assignments in a timely way, but also that you reach out to me when you have questions.

All work in the class will have a reasonable "window" of time within which to complete it, and because of the limit of a 5-week semester, we don't have a lot of room.

### Missed Exams:

In the event that you must miss an exam, please let me know as much in advance as possible. In the case of illness or emergency, you may be eligible to make-up one quiz or exam. Please see me upon your return to class and be prepared to provide written documentation. No make-ups will be offered for unexcused absences.

### Course Schedule:

**Day 1, Mon: Chapters 1&2 Measurement and Motion along a straight line**

**Day 2, Tues: Chapters 2&3 Motion along a straight line and Vectors**

**Day 3, Wed: Chapters 4 Motion in Two and Three Dimensions Day**

**4, Thurs: Chapter 5 Force and Motion I**

**Day 5, Mon: Chapter 6 Force and Motion II**

**Day 6, Tues: Chapter 7 Kinetic Energy and Work**

Day 7, Wed: **Chapter 8** Potential Energy and Conservation of Energy Day

8, Thurs: **Review**

Day 9, Mon: **Mid-term Exam**

Day 10, Tues: **Chapter 9** Center of Mass and Linear Momentum

Day 11, Wed: **Chapter 10** Rotation

Day 12, Thurs: **Chapter 11** Rolling, Torque, and Angular Momentum Day

13, Mon: **Chapter 15** Oscillations

Day 14, Tues: **Chapter 16** Waves

Day 15, Wed: **Chapter 18** Temperature, Heat, and the First Law of Thermodynamics Day

16, Thurs: **Chapter 19** The Kinetic Theory of Gases

Day 17, Mon: **Chapter 19&20** Entropy and the Second Law of Thermodynamics

Day 18, Tues: **Chapter 20** Entropy and the Second Law of Thermodynamics Day

19, Wed: **Review session**

Day 20, Thurs: **Final Exam**

### Laboratory Syllabus

#### Course Goals:

Upon successful completion of this course, students will be able to:

- Demonstrate the ability to work safely and effectively in the laboratory.
- Competently perform a broad variety of analytical and synthetic procedures and critically evaluate the results.
- Perform basic laboratory skills and understand common laboratory practices, procedures, and equipment, including safety issues.
- Explain, analyze and interpret the data obtained from each experiment.
- Demonstrate adequate skills in technical writing.

### Tentative Lab Schedule:

Topic
1. Mechanics 1.1 Applications of Newton's Laws 1.2 Work and Energy 1.3 Gyroscope 1.4 Linear Momentum and Collisions 1.5 Conservation of Angular Momentum
2. Heat & Fluids 2.1 Solid Expansion 2.2 Non-Newtonian fluid 2.3 Surface Tension 2.4 Thermometry 2.5 Convection and Radiation
3. Oscillations / Acoustics 3.1 Pendulum (Newton pendulum/ Foucault pendulum) 3.2 Resonance 3.3 Wave (Transverse and Longitudinal Wave) 3.4 Standing Waves 3.5 Doppler Effect

Each module will contain a Lab Activity document where you will find the instructions and procedures for that module's labs. These activity documents are designed to act as a study guide for the module test.

Each Lab Activity Document has the following:

- Purpose
- Learning Objectives
- Assignment Submission Checklist (Experimental Photographs, Formal Lab Reports, Graphs, Lab Assessment, etc.)
- Lab Activity Number
  - ✧ Introduction
  - ✧ Procedure
  - ✧ Analysis and Questions

You will only be submitting what is in the Assignment Submission Checklist Area. You aren't going to submit the handouts or analysis and questions section. Your instructor will have those answers if you are stuck and need clarification.

All reports/handouts will need to be submitted in a word document and uploaded as an attachment. Please make sure you title your file with your last name and the title of the lab. Your name should also be included on the actual document itself.