Course Syllabus

Course Name: Honors Physics I
Course Code: vp160

Course Pre-requisites

Applied Calculus II (vv156) or Honors Mathematics II (vv186)

Textbooks

Hugh D. YOUNG, Roger A. FREEDMAN, *University Physics* (14th edition, available in ER Room)

Ruth CHABAY, Bruce SHERWOOD, *Matter & Interactions, vol. I*: *Modern Mechanics* (3rd edition, available in ER Room)

Supplementary reading: Michael SPIVAK, *Physics for Mathematicians: Mechanics I, Publish or Perish Inc., 2010*

Instructor

Mateusz KRZYZOSIAK (m.krzyzosiak@sjtu.edu.cn)
Office hours: Tuesday 14.00-15.30, Tuesday (odd weeks) 18.15-20.00, Thursday (even weeks) 14.00-15.30 and by appointment
Office: room 211 (JI Building), Phone: 021-34206765 ext. 2111

Teaching Assistants

LIU Huihui (email: hqlucy@126.com; recitation class: Tuesday 8:00-9:40 in TBA; office hour: Wednesday 14:00-15:40 in TBA)

WANG Mukai (email: skybullbobby@sjtu.edu.cn; recitation class: Wednesday 14:00-15:40 in TBA; office hour: Wednesday 20:00-22:00 in TBA)

CAI Yide (email: 515370910087@sjtu.edu.cn; recitation class: Tuesday 18:20–19:50 in TBA; office hour: Tuesday 20:00-22:00 in TBA)

WANG Dingyu (email: altonwang@sjtu.edu.cn; recitation class: TBA; office hour: TBA)

Grading Policy

    Coursework (includes problem sets and a term project) 25%
    Midterm Exam I 25%
    Midterm Exam II 25%
    Final Exam 25%

For this course, the expected median grade is around "B/B+".

Academic Integrity

Lectures

Students are encouraged to read the relevant chapters in the textbook ahead of the lecture. Students are required to read and review the relevant chapters after the lecture. Lecture notes will be available on Canvas. Students are expected to attend lectures.

Recitation Classes

Weekly recitation sessions in smaller groups will be led by teaching assistants. Recitation classes will focus mostly on problem solving and discussion. Students are expected to attend and actively participate in the recitation sessions.

Homework

Homework will be assigned in the form of problem sets to be solved by each student individually. Problem sets will have a due date, by which solutions have to be handed in for grading. Please plan your time well, late homework will not be accepted.

Exams

There will be two midterm exams and one final exam as listed in the class schedule. All exams are closed-book. The use of a non-electronic English-Chinese dictionary will be allowed during the exams.

Honor Code

Oral discussion of homework problems with other students is allowed and encouraged at the level of general ideas, not specific solutions. It is not allowed to show any written work to other students. If any references to academic textbooks or research journals are made, they should be properly identified with the bibliographical data. No references to Wikipedia entries are allowed.

Course description and detailed teaching schedule

Honors Physics I (vp160) is the first part of an honors course in general physics. It will cover classical mechanics, including elements of fluid mechanics, and gravitation. This course will strongly rely on calculus, with many formulas being derived from general principles and discussed in relation to specific models of phenomena observed in the nature. Conceptual links across different areas of physics will be emphasized in order to develop interdisciplinary intuition allowing to approach problems in various fields of science and engineering in a systematic way.

Teaching Schedule

week	date	topic	textbook chapters
1	May 15–21	nature of physics; physical quantities; kinematics: motion in one dimension	1, 2
2	May 22–27	kinematics: motion in two and three dimensions; Newton's laws of motion and their applications	3, *
3	May 29–Jun 4	Newton's laws of motion and their applications	4, 5
4	Jun 5–11	periodic motion	14
5	Jun 12–18	dynamics in non-inertial frames of reference **first midterm exam**	4, 5, *
6	Jun 19–25	work and kinetic energy; potential energy and conservation laws	6, 7, *
7	Jun 26–Jul 2	introduction to Lagrangian mechanics; momentum, impulse, and collisions	* 7, *, 8
8	Jul 3–9	angular momentum and rotational motion; rigid body dynamics	9, 10*
9	Jul 10–16	rigid body dynamics; **second midterm exam**	9, 10*
10	Jul 17–23	equilibrium and elasticity; elements of fluid mechanics	11, 12
11	Jul 24–30	gravitation mechanical waves and sound	13 15*
12	Jul 31– Aug 6	mechanical waves and sound	15*, 16*
13	Aug 7–11	**final exam**	

* additional materials will be provided