

PHYS 135 - Introduction to Physics for Physical Science and Mathematics Majors I

Instructor:

Dr. Christine Natrass

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Office hours: Tuesdays 2 PM, Fridays 9 AM. Subject to cancellation – watch Canvas for announcements. In the class Zoom room.

Teaching assistant:

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Class time & Location: Nielsen 207 MWF 2:15-4:10. 1/3 of the class will attend in person each day. Zoom link for remote participation can be accessed through Canvas.

Course Description:

4 Credit Hours. Calculus-based physics of mechanics, sound, waves, and thermodynamics.

Satisfies General Education Requirement: (NS)

(RE) Corequisite(s): MATH 132 or MATH 141.

Comment(s): Alternative to PHYS 137 for physics majors.

Co/Pre-requisites: previous completion of Calculus I (Math 132 , 141, Math 147) or current enrollment in Calculus I. Mathematical proficiency in pre-Calculus is expected.

Required text and materials: *Matter and Interactions*, Ruth Chabay & Bruce Sherwood, 4th ed. with WileyPLUS access and a scientific calculator. Please bring your calculator to every class meeting. Students must have WileyPLUS access to complete online assessments.

Course Schedule: The course schedule (including reading sections) will be posted on Canvas. Please note that the schedule is subject to change and that any changes will be posted on Canvas.

Campus Syllabus:

The campus syllabus applies to this class. You are encouraged to review the [campus syllabus](#).

Learning outcomes:

After completing this course, students should be able to:

- Relate physical theories and principles to everyday, real-life experiences/occurrences
- Develop problem-solving skills and critical thinking skills
- Encounter a problem and offer conceptual solution based on physical reasoning and real-life experiences
- Extract concrete known and unknown quantities
- Express known and unknown quantities in a meaningful numerical/mathematical form
- Determine unknown quantities using a set of equations
- Apply physical concepts and problem-solving skills to a novel situation
- Realize that physics applies to a variety of situations
- Generate animated 3D computer models that represent a physical system

Course Structure:

This is a flipped format physics course, meaning the majority of class time will be dedicated to group activities, computations, discussions and occasional labs. This class meets in a SCALE UP (Student-Centered Active Learning Environment with Upside down Pedagogies) studio classroom to facilitate and encourage group discussions and cooperation. Students are expected to come prepared, having read all of the required sections from the textbook PRIOR to coming to class (the required reading sections will be posted on Canvas). The instructor will typically briefly review key concepts of the material, but most of class time will be dedicated to students working in small groups to complete activities and labs.

Due to social distancing requirements this semester, students will generally retain the same group all semester. Ideally, groups will consist of three members with each having a role: a manager, a recorder and a skeptic. Group members should rotate roles for every new assignment.

- Manager: identify roles, explain expectations and organize the work
- Recorder: prepare the final solutions/work and submit them
- Skeptic: Check the correctness of final solutions/work and make sure other group members understand solutions

Since most of the course involves group activities/discussions, attendance is mandatory. If for some reason a student is absent, please contact the other group members, so they can plan accordingly. If a student is absent, it is their responsibility to determine what material they missed.

Students will also engage in computational activities using VPython – no previous computer programming skills are required, since students will work on building their VPython proficiency as the semester progresses. Additionally, the textbook contains helpful information about programming in VPython and links to instructional videos.

Every student should be active, engaged with their group, and avoid at all costs letting other students “do the work” for them. Copying, cheating, and relying solely on other group members will only hurt students in the long run, because every student must ultimately complete assessments without assistance from others.

Please check the Canvas course site regularly for important announcements and updates (announcements will also be emailed to students). It is the students’ responsibility to ensure they are receiving email notices and announcements from Canvas.

Communication:

Emails to the instructor should have “Phys 135” in the subject. Students are expected to use their UTK email address for communication regarding the class and are expected to check their email regularly. You are very strongly encouraged not to disable emails from Canvas. Questions of general interest should be directed to the discussion forum, not made via private emails to the instructor. Only questions particular to an individual student should be made via private emails to the instructor. Questions of general interest made via a private email to the instructor may not be answered.

Grade:

The grade is:

- Exams: 55%
- Online homework: 20%
- Homework journal: 5%
- Lab: 15%
- Class participation: 5%

The grading scale will be:

- 93.00% and above A
- 90.00% - 92.99% A-
- 87.00% - 89.99% B+
- 83.00% - 86.99% B
- 80.00% - 82.99% B-
- 77.00% - 79.99% C+
- 73.00% - 76.99% C
- 70.00% - 72.99% C-
- 67.00% - 69.99% D+
- 63.00% - 66.99% D
- 60.00% - 62.99% D-
- 59.99% and below F

Homework:

Homework problems from the text will be assigned and submitted online using WileyPLUS. You are encouraged to study with other students, but every student is expected to understand the work they are submitting. Students are encouraged to seek help during office hours, using the discussion forum, or at the physics department tutorial center, all of which will be held online. Seeking help on Chegg, looking at solutions posted elsewhere, or sharing your solutions with others is considered cheating.

Homework journal: Students will keep a homework journal which shows all the steps/work students did to solve the online HW problems. By keeping a neat, organized homework journal in which you clearly identify the known and unknown quantities, make diagrams/graphs (as necessary) and show your work step by step, you are developing problem-solving skills and organizational skills. These will primarily be graded on completion, but you will get some feedback before each exam.

Exam:

Three one-hour exams will be given throughout the semester. The last exam will serve as a final. Though the final exam is not *technically* cumulative, physics is a science that builds on previous concepts. Students should expect to see some material covered earlier in the semester on later exams. The exam dates and times are announced at the beginning of the semester. Students who have a conflict should inform the instructor as soon as reasonably possible.

In-class Activities: Students will work in small groups on in-class activities that allow them to apply and implement the material they have read in the textbook. While students work in groups, it is essential that every group member is actively engaged and completes their tasks based on their role (manager, recorder, skeptic). The group recorder will submit the group's work as part of the in-class participation grade.

Lab computational activities: Labs will be done in groups; some labs will involve hands-on activities and experiments, while others will involve computational activities in VPython. The type of lab report (formal, informal) depends on the lab, but the majority of lab reports will be informal. To receive credit for a lab report, a student must attend and participate in the lab – in the case of an excused absence, the student should contact the instructor as soon as possible to schedule a make-up within one@utk.edu week of the original lab date. If a group member fails to participate/contribute to a report, their name should not be included on the report. The group recorder is responsible for submitting the lab reports.

Dear Student,

The purpose of this **Campus Syllabus** is to provide you with important information that is common across courses at UT. Please observe the following policies and familiarize yourself with the university resources listed below. At UT, we are committed to providing you with a high-quality learning experience. I want to wish you the best for a successful and productive semester.

- Dr. John Zomchick, Provost and Senior Vice Chancellor

UNIVERSITY CIVILITY STATEMENT -- <http://civility.utk.edu/>

“Civility is genuine respect and regard for others: politeness, consideration, tact, good manners, gracious-ness, cordiality, affability, amiability and courteous-ness. Civility enhances academic freedom and integrity and is a prerequisite to the free exchange of ideas and knowledge in the learning community. Our community consists of students, faculty, staff, alumni, and campus visitors. Community members affect each other’s well-being and have a shared interest in creating and sustaining an environment where all community members and their points of view are valued and respected. Affirming the value of each member of the university community, the campus asks that all its members adhere to the principles of civility and community adopted by the campus.”

EMERGENCY ALERT SYSTEM -- <http://safety.utk.edu/>

The University of Tennessee is committed to providing a safe environment to learn and work. When you are alerted to an emergency, please take appropriate action. Learn more about what to do in an emergency and sign up for [UT Alerts](#). Check the emergency posters near exits and elevators for building specific information. In the event of an emergency, the course schedule and assignments may be subject to change. If changes to graded activities are required, reasonable adjustments will be made, and you will be responsible for meeting revised deadlines.

ACADEMIC INTEGRITY

Each student is responsible for his/her personal integrity in academic life and for adhering to UT’s Honor Statement. The Honor Statement reads: “An essential feature of the University of Tennessee, Knoxville is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the university, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.”

YOUR ROLE IN IMPROVING THE COURSE THROUGH ASSESSMENT

At UT, it is our collective responsibility to improve the state of teaching and learning. During the semester you may be requested to assess aspects of this course either during class or at the completion of the class. You are encouraged to respond to these various forms of assessment as a means of continuing to improve the quality of the UT learning experience.

STUDENTS WITH DISABILITIES -- <http://sds.utk.edu>

Any student who feels they may need an accommodation based on the impact of a disability should contact Student Disabilities Services in Dunford Hall, at 865-974-6087, or by video relay at, 865-622-6566, to coordinate reasonable academic accommodations.

ACCESSIBILITY POLICY AND TRAINING – <http://accessibility.utk.edu>

WELLNESS -- <http://counselingcenter.utk.edu/> and <http://wellness.utk.edu/>

The Student Counseling Center is the university’s primary facility for personal counseling, psychotherapy, and psychological outreach and consultation services. **The Center for Health Education and Wellness** manages *974-HELP*, the distressed student protocol, case management, the *Sexual Assault Response Team*, and the *Threat Assessment Task Force*.

SOCIAL DISTANCING & COVID-19 PROCEDURES –

Students are required to wear face masks at all times and maintain social distancing (6 feet between individuals in traditional classrooms, or, in instructional laboratories and similar settings, only a few minutes in closer proximity when absolutely necessary to achieve learning objectives). Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher than normal temperature will be excused from class and should stay at home.

Instructors have the right to ask those who are not complying with these requirements to leave class in the interest of everyone's health and safety. In the event that a student refuses to comply with these requirements, the instructor has the right to cancel class.

Additionally, following other simple practices will promote good health in and out of the classroom, such as frequent and thorough hand washing, wiping down desks and seats with disinfectant wipes whenever possible, not sharing personal items such as pens and cell phones, and avoiding crowded hallways and other enclosed spaces.

The Volunteer Creed reminds us that we bear the torch in order to give light to others. As Volunteers, we commit to caring for one another and for the members of the communities in which we live, work, and learn. This semester, the University asks that we all demonstrate the Volunteer spirit by following these and other health guidelines and requirements.