

## PHYS 136 - Introduction to Physics for Physical Science and Mathematics Majors II

### Instructor:

Dr. Christine Natrass

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Office hours: Tuesdays 4 PM, Fridays 9 AM online in the class Zoom. Subject to cancellation – watch Canvas for announcements.

### Teaching assistant:

Alex Aukerman

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**Class time & Location:** Nielsen 207 MWF 2:15-4:10.

**COVID-19 Related Absences and Late Work:** This class will be broadcast online over Zoom. Zoom link for remote participation can be accessed through Canvas. If you may be sick or may have been exposed to COVID-19, you are expected to self-isolate, following university policies. Online participation is always allowed, no questions asked. Students who participate online are still expected to complete their work. An online version of the laboratories will be available. Online groups will be formed if possible.

### Course Description:

4 Credit Hours. Calculus-based physics of electricity, magnetism, and optics.

Satisfies General Education Requirement: (NS)

(RE) Corequisite(s): MATH 142.

Comment(s): Alternative to PHYS 138 for physics majors.

**Co/Pre-requisites:** Previous completion of Calculus II (Math 142, Math 148) or current enrollment in Calculus II. Mathematical proficiency in pre-Calculus and Calculus I is expected.

**Required text and materials:** *Matter and Interactions*, Ruth Chabay & Bruce Sherwood, 4<sup>th</sup> 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 136” 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 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 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.

## 136 Lab Syllabus (Natrass/Aukerman)

### Labs will be completed in person

#### Lab Reports:

Labs will be graded according to a proficiency policy.

- **Full credit** – lab is completed in a clear and professional manner i.e. all work shows logical steps leading to the correct result.
  - For example: code is written in a clear and understandable way, while the simulation runs as expected; all questions have been answered (if applicable) in a clear, concise manner that indicates understanding of the material; data tables are complete and contain the required information (if applicable)
- **Partial credit** – lab is in some way unclear and/or unprofessionally done i.e. some steps are ambiguous or fallacious in nature, which leads to an incorrect result.
  - For example: the code has a minor error leading to an unexpected simulation run; not all questions are answered (if applicable); data is missing (if applicable)
- **Minimal to no credit** – lab is exceptionally poor i.e. incomplete, incorrect, or missing altogether.
  - For example: the code has not been properly written and debugged, leading to numerous errors and no simulation; no questions answered (if applicable); no data table submitted (if applicable)

**The group Recorder is responsible for submitting all lab/lab-related material.**

**Group members should make sure that ALL of them have access to the code, data, etc. just in case code, data etc. is lost or deleted!**

**If a student does not participate in a lab, they will not be given credit even if the other group members have completed the lab. If a group member fails to participate/contribute to a report, their name CANNOT BE INCLUDED on the report. Lab attendance is checked.**

#### Late/Absence Policy:

- **Remote participation** – Students who cannot attend in person due to self-isolation or quarantine are expected to participate remotely.
- **Documented excuse** – you will have **one week** (from the date posted on the course schedule) without penalty to complete the missing lab. After which you will fall into the ‘no excuse’ category. Students will need to have a valid, reasonable excuse for missing lab and written documentation is expected.
- **No excuse** – after the one week grace period mentioned above has passed, you will have one week to complete the lab for half credit. **Zero credit will be given for labs later than a week.**

**Every attempt will be made to post lab scores in a timely fashion, but that cannot be guaranteed.**

**ANY QUESTIONS ABOUT LAB MUST BE DIRECTED TO THE TA**

## University Policies and Support for Students Needing to Self-Isolate

### GETTING TESTED FOR COVID-19

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If you need to be tested for COVID-19 because you are feeling sick or have been in close contact with someone who has been exposed, the [Student Health Center](#) provides diagnostic testing for students. If you get tested for COVID-19, you should begin self-isolating and follow university policies explained below.

### SELF-ISOLATION POLICY

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If you begin to feel sick or you have been in contact with someone who has COVID-19, the first step is to begin self-isolating immediately and fill out the university's [self-isolation form](#). The contact tracing team will follow up with you—generally within 24 hours, but the response time can vary depending on caseloads. You can read more about the university's self-isolation policy and procedures [here](#).

### CONTACT INFORMATION FOR QUESTIONS OR HEALTH CONCERNS

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If you have a health concern, you can call the [Student Health Center](#) nurse triage line at 865-974-5080. The university has a nurse available to speak to students by phone 24 hours a day. After-hours care has been arranged [for eligible students through the UT Medical Center](#) emergency room at 865-305-9000.

If you are having an emergency, you should call 911.

**If you have any questions about the university's COVID-19 policies and procedures, you can call 865-656-SAFE (7233), Monday-Friday, 8:00 am to 5:00 pm.**

## Classroom Policies for Students Who Are Ill or Self-Isolating

### CLASSROOM ATTENDANCE POLICY

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*For Face-to-Face Courses:*

If you are self-isolating or quarantining, do not come to class until you have been cleared to do so by your health care provider, the contact tracing team, or the Knox County Health Department. **Your absences will be excused and accommodated only if you have followed the university's policy on self-isolation.** To verify that you are following university policy, you will need to email me a copy of the confirmation email you receive after submitting your self-isolation form. You do not need to provide any personal medical information.

*For online synchronous courses:*

If you are feeling well enough, you should continue to attend class. If you are too ill to attend class, **your absences will be excused and accommodated only if you have followed the university's policy on self-isolation.** To verify that you are following university policy, you will need to email me a copy of the confirmation email you receive after submitting your self-isolation form. You do not need to provide any personal medical information. You should begin attending class again as soon as you are feeling well enough to do so.

## **MAKE UP/LATE WORK**

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*For Face-to-Face Courses:*

If you are feeling well enough, you should keep up with the course readings and assignment due dates. I will post recordings of our class meetings after they have ended here [include link] on Canvas so that you can keep up with the course information. *[If you are unable to record your class sessions, provide guidance for students on how they should obtain in-class information such as getting notes from a classmate or reviewing Powerpoints that you post online]*

If you are too ill to complete daily tasks, we will discuss accommodations individually. **It is your responsibility to reach out to me before returning to class to set up a time to discuss these accommodations.**

*For Online Courses:*

*Synchronous Courses:* If you are feeling well enough, you should continue to attend class and turn in assignments on time.

If you are too ill to complete daily tasks, we will discuss accommodations individually. You should begin attending class again as soon as you are feeling well enough to do so. **It is your responsibility to reach out to me once you return to class to set up a time to discuss any needed accommodations.**

*Asynchronous Courses:* If you are feeling well enough, you should continue to keep up with the course material and complete assignments on time.

If you are too ill to complete daily tasks, **we can discuss accommodations only if you have followed the university's policy on self-isolation.** To verify that you are following university policy, you will need to email me a copy of the confirmation email you receive after submitting your self-isolation form. You do not need to provide any personal medical information. we will discuss accommodations individually. **It is your responsibility to reach out to me to discuss these accommodations once you are well enough to begin completing your work.**

*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 wish you the best for a successful and productive semester.*

*Provost Susan Martin*



#### **UNIVERSITY CIVILITY STATEMENT**

Civility is genuine respect and regard for others: politeness, consideration, tact, good manners, graciousness, cordiality, affability, amiability and courteousness. 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:  
<http://civility.utk.edu/>.

#### **ACADEMIC INTEGRITY**

“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.”

#### **DISABILITIES THAT CONSTRAIN LEARNING**

“Any student who feels he or she may need an accommodation based on the impact of a disability should contact the Office of Disability Services (ODS) at 865-974-6087 in 2227 Dunford Hall to document their eligibility for services. ODS will work with students and faculty to coordinate reasonable accommodations for students with documented disabilities.”

#### **YOUR ROLE IN IMPROVING TEACHING AND LEARNING THROUGH COURSE 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.

#### **KEY RESOURCES FOR STUDENTS:**

- Undergraduate Catalogs: <http://catalog.utk.edu> (Listing of academic programs, courses, and policies)
- Graduate Catalog: <http://catalog.utk.edu/index.php?catoid=7/> (Listing of academic programs, courses, and policies)
- Hilltopics: <http://dos.utk.edu/hilltopics> (Campus and academic policies, procedures and standards of conduct)
- Course Timetable: [https://bannersb.utk.edu/kbanpr/bwckschd.p\\_disp\\_dyn\\_sched](https://bannersb.utk.edu/kbanpr/bwckschd.p_disp_dyn_sched) (Schedule of classes)
- Academic Planning: <http://www.utk.edu/advising> (Advising resources, course requirements, and major guides)
- Student Success Center: <http://studentsuccess.utk.edu> (Academic support resources)
- Library: <http://www.lib.utk.edu> (Access to library resources, databases, course reserves, and services)
- Career Services: <http://career.utk.edu> (Career counseling and resources; HIRE-A-VOL job search system)