PHYS135, Sect.3, 4Credit Hrs., Online, Fall 2023

COURSE INFORMATION

Introduction to Physics I (w/Calculus – Phys/Sci Math Majors)
Course Section: 135003
Course Credit Hours: 4

Faculty Contact Information

- Irene Datskou Guerinot
- iguerino@utk.edu
- 611 Nielsen Bldg. (Physics Bldg.)

- Office Hours: Tuesday 10am-11am & Thursday 12:45pm-1:45pm EST In Person **OR** Virtual (Zoom) by appointment

Please don't hesitate to email me with updates, questions, or concerns. I will typically respond within 24 hours during the week and 48 hours on the weekend. I will notify you if I will be out of town and if connection issues may delay a response.

Teaching Assistant-All instructors will have office/tutoring hours at different times during each week. Students from all sections can attend any instructor's office/tutoring hour.

Each student acknowledges and agrees that all (in person and digital) materials and instruction related to this course, including this syllabus, lectures, presentations, and any verbal and written communications, are the sole and exclusive intellectual property of the instructor. Each student agrees not to (or permit anyone else to) record, copy, or transmit any physical or online classes or any related materials without the instructor's prior approval.

COURSE DESCRIPTION

Physics 135 (calculus based introductory physics) introduces students to the basic principles of mechanics (kinematics, Newton's Law, energy and momentum, rotation and oscillation) and wave motion. Physics 135 (section 3) is an online, first-year physics course for majors in mathematics, physics, computer science, and the physical sciences. It is a 4-credit hour course. Only students which have already completed a first-year **calculus** course are allowed to register for Physics 135 without co-registering for Mathematics 132 or 141. You must have a computer with a webcam, reliable connectivity, and you will need a calculator.

Student Learning Outcomes/Objectives
Upon completion of this course the student will be able to:

- describe & understand the difference between scalar & vector quantities.
- explain, verbally & mathematically, one- and two-dimensional motion, making use of the equations of kinematics as well as energy conservation principles.
- identify the cause of basic linear & rotational motions, by describing/determining forces, work & energy, impulse & momentum.
- determine the angular velocity and angular acceleration and kinetic energy of rotating objects.
- use the relationship between torque and angular acceleration to solve problems involving rotational motion.
- determine if an object is in static equilibrium.
- analyze orbital motion using Kepler's laws.
- analyze simple harmonic motion & its relationship to basic circular motion.
- describe wave motion & determine the properties of waves.

- qualitatively describe sound and water waves; calculate the fundamental and harmonic frequencies of wind instruments, the Doppler shift of sound waves for cases where either the source or the observer is in motion.

LEARNING ENVIRONMENT

This is a fully online course (lectures & laboratories), which means to complete this course you are not required to travel to campus. You will participate in this course asynchronously and using Canvas, the University of Tennessee's Learning Management System. **Time Commitment:** An online course requires discipline, self-motivation, collaboration, and organization. It also requires the same credit hours of work as a face-to-face course. Although there is greater flexibility for "when" you may complete coursework online, there are required due dates (many!). Class participation is required and expected. You should expect to spend between 12 and 16hours per week (more if you need a good math review) working and learning in the course. Please plan your time accordingly.

The class material is divided into 10 modules. For each module students are expected to submit assignments and a lab report online on time. The course uses online class modules, a textbook, and a workbook (offering math review amongst other units). There are no formal lectures. Students are expected to complete two online sub-modules per week. Students earn class participation credit by participating in the Canvas discussions forums. They must make at least one meaningful contribution to the discussion associated with each module.

HOW TO BE SUCCESSFUL IN THIS COURSE

- There is some math in this course. Quite a bit actually---but that's good.
- This could be a challenging course if you do not keep up with the material.
- Math is never more than simple algebra and calculus---if you find yourself doing a page of calculations, you are way off the path.
- The hardness is conceptual---and with applying logic.
- When confronted with a problem, recognize the concepts needed for a solution, and then you should know or be able to find the right equation (and then do the algebra in usually just a couple lines).
- Do your homework (yourself)!
- Do the homework in groups!
- Make sure you understand both "why" and "why not."
- Note all the course graded assignments and exams on your **personal calendar**.
- Read (carefully and take notes) the **textbook and other assigned reading material**!
- **Nail the early material!** Every concept builds on the previous, so it is imperative to get the early material down.
- **Don't get behind!** A Physics course is **never** a "crammable" course. We will cover a lot of information in a short amount of time. It is impossible to learn this material right before an exam.
- **Check your UT email and Canvas** site every day. Set Canvas notifications.
- I am trying to convince you NOT to take the seemingly easy path of just trying to memorize a trick for every problem you see.
- I am trying to convince you to understand the general approach---that's the way to prepare to deal with problems you've never seen before.
- Ask for help. You might also want to check out the following: How to be Successful in an Online Course.

COURSE REQUIREMENTS

Textbook: "University Physics, Volume 1", a free, online textbook by OpenStax College. https://openstax.org/books/university-physics-volume-1/pages/1-introduction. A PDF copy of the book can be downloaded from the OpenStax website.

Workbook (examples):
A link to the workbook is on Canvas.

Great free resources: https://www.physicsclassroom.com/ http://hyperphysics.phy-astr.gsu.edu/hbase/index.html
You must have a computer with a webcam, reliable connectivity, and you will need a calculator.

Technical Support
For technical issues, contact the OIT HelpDesk by phone at (865) 974-9900 or at the Walk-in HelpDesk,. For IT and Computing issues, use the online Contact Form. Also: Getting Started with Zoom, Online@UT Canvas, the UT Library, the UT Library's Information for Distance Education, and UT Research Guides and Subject Librarians.

COURSE COMMUNICATIONS POLICY

Preferred mode of communication: e-mail (directly or through Canvas).

Online "Classroom" Etiquette (Netiquette)
UT's Principles of Civility and Community.]

Announcements
Make sure you go to Account (Canvas) and set up your notifications' preferences. to ensure you receive instructor announcements. Failure to do so is not a valid excuse for missing assignment(s).

ASSIGNMENTS, ASSESSMENTS, AND EVALUATIONS

The class will be graded on a straight percentage with the following breakdown:
A:>90% A-:87%-89% B+:86% – 83% B:82%-80% B-:79%-77% C+:76%–73% C:72%-70% C-:69%-67% D+:66%–63% D:62%-60% D-:59%-57% F: ≤ 56%

Element	Contribution
Tests (2)	50%
Homework Assignments	20%
Discussions/Participation	10%
Laboratories	20%
Extra Credit (up to 50pts max)	10%

Homework assignments:
Assignments cover the material presented in the online material. They may refer you back to a module, to some activity you were asked to complete in a laboratory, or to the workbook. Assignments are submitted online on Canvas. Assignments are scored by the computer, and you will receive your assignment grade immediately. You can submit the assignments up to three times if you need to improve your score. The

highest score counts. **Most** assignments are due at 11:59 PM on the indicated date. No late assignments will be accepted.

Laboratories:
The Fall 2023 Physics 135 Lab Syllabus on Canvas explains the lab grading policy. You cannot earn a passing grade for the course, unless you earn a passing grade for the labs.

Class participation:
Participate in online discussions for class participation credit. Meaningful participation before the due date of the second homework, lab, and extra credit associated with a module gives you 100% class participation credit for this module. Post questions, answers, hints, comments, etc., under one of the suggested topics or start your own topic.

What is a meaningful contribution? A meaningful contribution is any contribution that shows that you gave it some thought.
Questions, answers to student question, adding additional information to answers, asking for more information about certain aspects, disagreeing with aspects of an answer, correcting statements that you think are inaccurate, commenting on aspects of answers that you like but did not think about before, etc, are all meaningful contributions. You can and should discuss homework and extra credit questions with your classmates, but please do not post the answers directly.
Just saying "Yes", "I agree", "I like your answer", etc. before the module's discussion deadline are not meaningful contributions.

Extra credit assignments (optional but highly encouraged!):
You can earn up to 50 points extra credit by answering 25 extra credit questions, distributed over the 10 modules. You can submit this extra credit assignment twice. The questions are challenging, but you are encouraged to discuss the assignment with your fellow students in the discussion forum before the submission. Extra credit points are added to your total score from tests, homework assignments, class participation, and laboratories.

Tests:
Tests are 90-minute online exams. Exam 1 questions are about material covered in modules 1 - 5, and exam 2 questions are about material covered in modules 6 - 10. **You will take the tests online using the Chrome browser with the Proctorio plug-in. Make sure you practice ahead of time using the Practice Tests.**

Test 1	October 16	formulas	Study Guide
Test 2	December 8	formulas	Study Guide

Academic Honesty/Student Conduct
Students are expected to complete their own work. Student work completed for a former class or by someone other than the student could result in disciplinary action.
Students shall not:

- Cheat.
- Plagiarize.
- Collaborate with others on an assignment unless the student is assigned by the instructor to complete group work.
- Allow another student to access your Canvas account using your NetID.

*Please note: The instructor reserves the right to revise, alter or amend this syllabus as necessary. Students will be notified in writing/email of any such changes.

UTK FALL 2023 PHYS135 – Sect. 3 – Fully ONLINE **Tentative - Subject to change** This syllabus is intended to give the student guidance in what may be covered during the semester and will be followed as closely as possible. However, the professor reserves the right to modify, supplement and make changes as the course needs arise. Please, see me early on if you have any difficulty.

Reading Schedule	Module	Online material	Textbook Chapters	Homework, Lab, Piazza, Ex. Credit Schedule	Due Date
23-Aug	1	Introduction			
24-Aug		Position and displacement	2.1 - 2.3		
28-Aug	2	The language of kinematics	3.1	A1, Lab 1, Ex 1, Discussion 1	30-Aug
31-Aug		Motion in one dimension	3.2 - 3.4	A2	5-Sep
5-Sep		Freely falling objects	3.5 - 3.6	A3, Lab 2, Ex 2, Discussion 2	6-Sep
7-Sep	3	Motion in 2 and 3 dimensions	4.1 - 4.2	A4	11-Sep
11-Sep		Projectile motion	4.3	A5, Lab 3	13-Sep
14-Sep		Circular motion	4.4 - 4.5	A6, Ex 3, Discussion 3	18-Sep
18-Sep	4	Newton's 1st law	5.1 - 5.2	A7	20-Sep
21-Sep		Newton's 2nd law	5.3 - 5.4	A8, Lab 4	25-Sep
25-Sep		Newton's 3rd law	5.5 - 5.7	A9, Ex 4, Discussion 4	27-Sep
28-Sep	5	Friction and drag	6.1, 6.2, 6.4	A10, Lab 5	6-Oct
6-Oct		More applications of Newton's laws	6.3	A11, Ex 5, Discussion 5	11-Oct
12-Oct		Review			
16-Oct		**Test 1 – ONLINE Proctorio - Thursday Oct. 12 7am-11:30pm / 90 minutes**			
19-Oct	6	Work and kinetic energy	7	A12	23-Oct
23-Oct		Conservation of energy	8	A13, Lab 6	25-Oct
26-Oct		Situations		A14, Ex 6, Discussion 6	30-Oct
30-Oct	7	Linear momentum	9.1 - 9.5	A15	1-Nov
2-Nov		Rockets	9.6 - 9.7	A16, Lab 7, Ex 7, Discussion 7	6-Nov
6-Nov	8	Rotational kinematics	10.1 - 10.3	A17	8-Nov
9-Nov		Rotational dynamics	10.4 - 10.8	A18, Lab 8	13-Nov
13-Nov		Angular momentum, Kepler's laws	11.1 -11.3	A19. Ex 8, Discussion 8	15-Nov
16-Nov		Simple harmonic motion	15.1 - 15.3	A20	20-Nov
20-Nov		The pendulum	15.4 - 15.6	A21, Lab 9, Ex 9, Discussion 9	27-Nov
27-Nov	10	Mechanical waves	16	A22	29-Nov
1-Dec		Sound waves	17.1 - 17.6	A23, Lab 10	4-Dec
4-Dec		The Doppler effect	17.7 - 17.8	A24, Ex10, Discussion 10	6-Dec
6-Dec		Review		Make-Up Lab	6-Dec
8-Dec		Test 2 **ONLINE Proctorio - Thursday Oct. 12 7am-11:30pm / 90 minutes**			