YOUNG WOMEN'S Leadership Academy

OnRamps Physics 2026-2027
Mechanics, Heat, and Sound

Updated: August 7, 2026

Contact Information

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COURSE DESCRIPTION

Mechanics, Heat, and Sound introduces big ideas in physics, such as Newtonian mechanics (including motion, forces, energy, and rotation), as well as solid and fluid mechanics, oscillations, waves, sound, and heat. Taken together, the topics illustrate the general idea that the behavior of many systems in the world can be described precisely by applying appropriate concepts in concert with simple mechanics.

This is an algebra-based (non-calculus) course in mechanics that fulfills a general physics requirement. Proficiency in algebra and geometry is assumed. Students will practice problem solving and analyze physical situations involving motion, force, energy, rotations, heat, oscillations, waves, and sounds. They will explore concepts in small groups, develop ideas, and explain them. This course lays the groundwork for college majors including engineering, physics, chemistry, or math.

COURSE ACTIVITIES

Below you will find descriptions of the most common activities that students will participate in during the course of each semester. **Throughout the year, students will:**

- Actively engage in Peer Instruction: each module will have embedded conceptual questions designed to expose common difficulties and misconceptions associated with the content. They will be given time to formulate their own answers to each question and work in small groups to reach a consensus on an answer. This promotes discussion and articulation of understanding.
- Complete college-level homework assignments for each unit using the Quest Learning System. Collaboration on homework is encouraged but the independent work will need to be submitted.
- Build problem-solving skills as each student engages with the course materials.
- Conduct and design experimental procedures to meet a laboratory investigation's goal and objectives.
- Collect and analyze data from experiments to draw conclusions about models in physics.
- Apply statistical analysis - including average, standard deviation, standard uncertainty, and 95% confidence interval – to interpret findings.
- Communicate lab findings using words and diagrams, as appropriate.

GRADES → YWLA Grading Expectations (PLEASE REVIEW!)

Major (Unit Exams, Quizzes)	60%
Minor (Quest HW, PI, daily work, Labs)	40%

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Classroom Resources

- **Textbook:** *College Physics 2e* by OpenStax. College Physics 2e
- **Google Classroom code: eoakhccl**
- **Canvas to access UT class:** https://onramps.instructure.com/
- Scientific calculator will be provided
- Chromebook must be charged and available for use every day in class!

COURSE TOPICS

Unit	Topic	Lab
0	Introductory Concepts	Measuring Height
1	Kinematics	Evaluating the Acceleration Model
2	Newton's Laws	Static Friction
3	Energy	Conservation of Energy
4	Momentum	Collisions
5	Rotational Motion	Rotational Equilibrium
6	Solids and Fluids	Buoyant Force
7	Simple Harmonic Motion and Waves	Pendulum Amplitudes
8	Laws of Thermodynamics	Specific Heat
9	Electromagnetism, Optics, Quantum Mechanics	*(tbd)*

ADDITIONAL INFORMATION:

Dual Enrollment Model. The student is separately enrolled in a high school course implemented by a high school teacher and a distance college course implemented by a University of Texas Instructor of Record. Depending on the student's performance, the student may earn high school credit, college credit, both high school credit and college credit, or neither high school credit nor college credit. The student's final high school course grade may be the same or different from the student's final college course grade.

Academic Integrity: Please adhere to the academic integrity policy found in the student handbook. All students are expected to complete their work individually, unless otherwise instructed. Plagiarism will not be tolerated.The use of generative Artificial Intelligence (AI), AI-content generators (such as ChatGPT) or other unauthorized aid when completing college

assignments is a form of academic misconduct. Using AI to generate ideas, outline an approach, answer questions or solve problems may constitute a violation of academic integrity. The UT Austin Instructor of Record will make clear in the assignment directions for each assignment whether collaboration is allowed and what types of tools may be utilized. Refer to the Assignments and Grading section for further details about assignment types in your course.

College-Side Notes (not all-inclusive, please see UT syllabi for complete information):

- Please make sure to read and understand the UT syllabi. There should be two, corresponding to the lecture (PHY 302K) and Lab (PHY 102M). These are found in the Canvas page.
- The homework will be assigned and due weekly and late homework will not be accepted. If you have difficulty submitting your answers on Quest prior to the deadline, for any reason, you have 24 hours to notify your high school Instructor via email or Canvas message. If an extension is granted, you may have up to two additional days to complete the assignment. The two lowest homework assignments will be dropped. Collaboration on homework is allowed and encouraged. If you are absent for at least 3 school days during a Quest Homework window, you have 24 hours after your return to school to request an extension from your high school Instructor. Your high school Instructor will extend the assignment submission window under the following circumstances: medical illness or injury, technical issues with Quest, or internet outage. If an extension is granted, you will have up to two additional days to complete the assignment. However, after the solutions are posted by your high school Instructor, no further extensions can be given. These policies are firm because of flexibility already incorporated into the Quest Homework drop policy.
- There will be exams at the end of each unit (1-7). Unit 8 does not have a separate exam, as it will be included in the final exam. All exams will be proctored in class, timed, and submitted in Quest. You will be allowed to use the following materials on the exams: a calculator (Chromebook not allowed), scratch paper and a formula sheet. Optional retests will be offered for exams (units 1-7) if you wish to increase your grade. Missed Exams and Problem-Solving Skills Assessments due to extenuating circumstances, such as a medical or family emergency, will count as zeros if the work is not completed within five school days after you return to school. Makeup versions of Exams will not be the same as original versions. If you know you will miss an Exam or Problem-Solving Skills Assessment for an excused reason, you are encouraged to arrange a time to complete the assessment before your absence

Mr. Zubia