



Mechanics, Heat, and Sound
PHY 302K: General Physics 1 (Mechanics/Heat/Sound)
Course Syllabus: 2019 – 2020
Calendar B

UT Austin Faculty Lead	UT Austin Instructor(s) of Record	Course Coordinator(s) and/or Manager
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1. COURSE DESCRIPTION

Mechanics, Heat, and Sound introduces big ideas in physics, such as Newtonian mechanics, which describes objects changing their state of motion because of forces causing them to accelerate. Taken together, the topics reinforce the general idea that the behavior of many objects in the world can be described precisely with simple mathematics.

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 analyzing physical situations involving motion, force, energy, rotations, heat, oscillations, waves, and sound. Students 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. This course may be used to fulfill the science component of the university core curriculum.

Natural Science & Technology, Part I (Texas core code 030)
TCCN PHYS 1301

A. Course Pre-requisites

- Algebra I
- Geometry
- Recommended or concurrent enrollment: Algebra II

B. Course Learning Outcomes

- Students will discover and apply concepts from kinematics, dynamics, energy, gravitation, rotational motion, statics, and elasticity.
- Students will describe heat conduction, heat capacity, the laws of thermodynamics, and engines.
- Students will investigate simple harmonic oscillators, traveling waves, standing waves, sound intensity, interference, and diffraction.

C. Course Format and Procedures

Course Outline

PHY 302K consists of eight units distributed across three major sections: Mechanics, Sound and Heat.

MECHANICS	Sound	Heat
1. Mathematics and One-Dimensional Motion	7. Waves and Sound	8. Thermal Physics, Thermal Energy, and Laws of Thermodynamics
2. Two-Dimensional Motion and Newton's Laws		
3. Energy		
4. Momentum		
5. Rotational Motion and Gravity		
6. Solids and Fluids		

Course Pedagogy Overview

The course pedagogy will focus on Peer Instruction and Inquiry-Based Learning. Learning will be student-centered and emphasize the importance of active construction of learning. In the classroom, you will discuss ideas with your peers and articulate your own understanding. You will explore simple models and simulated systems to test and evaluate your ideas.

Instructional Activities

Lectures and Discussion

You will actively engage in Peer Instruction instead of a traditional lecture model. During Peer Instruction, each lecture will have embedded ConcepTest conceptual questions designed to expose common difficulties and misconceptions associated with the content. You will be given time to formulate your own answers to each question and work in small groups to reach a consensus on an answer. This promotes discussion and articulation of understanding.

Quest Homework

You will complete a college-level homework assignment for each unit using the Quest Learning System. Collaboration on homework is encouraged. However, you will be required to turn in a paper copy of your independent work to provide reasoning for your answer selections.

Labs

Each unit will have at least one laboratory activity which will utilize inquiry-based learning. These learning experiences will be both hands-on and through the use of computer simulations. You will be expected to pose questions, design experiments, collaborate, and communicate results. These labs are part of the Mechanics, Heat, and Sound 102M Laboratory course.

D. University Course Staff

- *UT Austin Faculty Lead* – A UT Austin faculty member who designs and oversees delivery of the OnRamps college distance course, and ensures its alignment to the course as it is delivered at the residential university campus.
- *Course Coordinator/Manager* – A UT Austin staff member and designee of the UT Austin Faculty Lead who serves as a primary subject-matter expert in the academic discipline of the OnRamps course and provides yearlong support to high school Instructors to ensure

the course is delivered with fidelity. As a designee of the UT Austin Faculty Lead, the Course Coordinator/Manager assist with academic integrity investigations, send official University communication to students, and ensure students have access to all course resources and policies. An OnRamps Implementation Coach is a full-time UT Austin staff member and designee who may meet any of these described functions.

- *UT Austin Instructor of Record* – A UT Austin-appointed staff member who grades or oversees grading of college course work and determines student eligibility and credit award. The UT Austin Instructor of Record also investigates and resolves suspected incidents of academic integrity violations in the distance college course. The UT Austin Faculty Lead, Course Coordinator/Manager, or other UT Austin-appointed staff member may also serve as the UT Austin Instructor of Record.

E. Course Schedule

[In the table below, inform students of approximately when major assignments are due and exams are administered. Put more detailed information on Canvas.]

Date Window	Unit & Topic
Aug 19 – 23	OnRamps Orientation
Aug 26 – Sept 13	Unit 1: Mathematics & Problem Solving (Quest HW1)
Sept 16 – Oct 2	Unit 1: One-Dimensional Motion (Quest HW2, Exam 1)
Oct 3 – 16	Unit 2: Vectors & Two-Dimensional Motion (Quest HW3)
Oct 17 – 30	Unit 2: Newton’s Laws of Motion (Quest HW4, Exam 2)
Oct 31 – Nov 20	Unit 3: Energy (Quest HW5, Exam 3)
Nov 21 – Dec 11	Unit 4: Momentum (Quest HW6, Exam 4)
Dec 19 – 20	Midterm Exam (optional, Units 2 and 3 retakes)
Dec 12 – Jan 9	Unit 5: Rotational Motion & Gravity (Quest HW7)
Jan 10 – 29	Unit 5: Laws of Rotational Motion (Quest HW8, Exam 5)
Jan 31 – Feb 13	Unit 6: Solids & Fluids (Quest HW9, Exam 6)
Feb 14 – Mar 6	Unit 7: Waves and Sound (Quest HW 10, Exam 7)
Mar 9 – 27	Unit 8: Thermal Physics (Quest HW 11)
Mar 31 – Apr 9	Unit 8: Thermal Energy (Quest HW12)
Apr 13 – 24	Unit 8: Laws of Thermodynamics (Quest HW13)
May 4 – 8	Spring Final Exam (Units 1 – 8)

2. COURSE REQUIREMENTS

A. Required Materials and Devices

- **Canvas Learning Management System.** OnRamps provides an online learning environment in Canvas Learning Management System (LMS) for all students in this class. You will have access to two (2) Canvas courses for the purpose of the dual-enrollment experience: the OnRamps high school course and the OnRamps college course. You are expected to access Canvas at least weekly for readings and course resources. You will get many of your assignments and turn in your college work in Canvas. You are responsible for reading course information, including assignment instructions and due dates, that is posted in Canvas. You are also responsible for frequently checking your Canvas Inbox and viewing course announcements. URL: <https://onramps.instructure.com>
 - **Quest.** This course uses Quest, a web-based content delivery and homework server system maintained by the College of Natural Sciences at UT Austin. You will turn in your UT Austin work, including homework and exams, in the Quest System. You are expected to access Quest daily for homework assignments. Exams will be given in Quest during your class time and solutions will be posted after the deadline has passed. Quest can be accessed using a computer, tablet and/or smartphone. URL: <http://quest.cns.utexas.edu>
 - **Learning Catalytics.** This course uses Learning Catalytics (LC), a web-based interactive student response tool. Questions in LC will be a part of your college grade. LC can be accessed using a computer, tablet and/or smartphone. URL: <http://learningcatalytics.com>
 - **OnRamps Portal.** You will access the OnRamps Portal throughout the term to view and make decisions about your current OnRamps distance college course enrollment(s), including whether you are eligible for the opportunity to earn college credit and whether you wish to accept or decline college credit, if earned, at the end of the course. URL: <https://onramps.utexas.edu/portal>
- B. Email.** Email is an official means of communication at UT Austin. OnRamps staff will use email to communicate course, enrollment, and credit information to you. It is your responsibility to keep your email address updated in Canvas and the OnRamps Student Portal at all times. You are expected to check email frequently in order to stay current with OnRamps-related communications, recognizing that certain communications may be time-critical. Failure to check email is not acceptable reason for missed communication or missed deadlines.
- C. Classroom Expectations**
- **Class participation.** OnRamps PHY 302K is an interactive class and you are expected to actively participate in class discussions, Peer Instruction sessions, and safely participate in the lab experiences. You will also regularly collaborate with your peers during laboratory investigations and small group work.
 - **Behavioral expectations.** In an effort to minimize distractions, cell phones are prohibited in class during any college assessment activity.
 - **Laboratory Safety.** There is a **ZERO TOLERANCE POLICY** for unsafe practices and behavior in the laboratory. You are expected to adhere to proper guidelines as outlined in the course both for your safety and the safety of those around you.
- D. How to Succeed in this Course**

This is a college-level course. Expect to be challenged while learning the material but be confident that consistent dedication to your work will produce the desired results. The course moved at a faster pace than most high school courses so it is important to manage time effectively to meet assignment deadlines. Success requires regular class attendance as well as thoughtful and disciplined study outside of class.

Effective study habits are developed over time and through practice. The tips below represent some common and beneficial strategies to incorporate into your study.

10 Effective Study Habits

1. Attend class every day and be an active participant
2. Take and review thorough notes and stay organized with class materials.
3. Schedule study time, spread out your studying, and study often.
4. Mix up problems and topics when you study.
5. Instead of re-reading something, explain it to yourself or someone else.
6. Generate your own questions and ask why something makes sense.
7. Study with a group or partner.
8. Eliminate distractions when studying.
9. Use the practice exams to practice how to solve the question types that will be tested.
10. Take care of yourself - Get plenty of rest, exercise to release stress, and eat well.

If you need help, ask for it. Attend tutorials and seek assistance from your High School Instructor of Record. Your success is of the utmost importance.

E. Assignments & Grading

High School grades will be determined by your High School Instructor and may include a greater variety and number of assignment grades, including lab grades.

The UT Austin college grade is based on the following:

Assessment	Description	Frequency	Assignment Type	% Course Grade
Unit Exams	Given at the end of each unit (Units 1 – 7)	Every 3 – 4 weeks	Individual assessment	45%
Final Exam	Cumulative exam (units 1 – 8)	Once	Individual assessment	20%
Quest Homework	A set of learning problems per unit submitted via the Quest Learning System	Every 2 weeks	Individual assessment	20%
Participation	Determined by Learning Catalytics Scores	Weekly	Peer Instruction	14%
Orientation	OnRamps Orientation Modules	Once	Individual Assessment	1%
Total	---	---	---	100%

College Course Grading Scale

A	89.50 – 100.00	
A-	84.50 – 89.49	
B+	79.50 – 84.49	
B	74.50 – 79.49	
B-	69.50 – 74.49	
C+	64.50 – 69.49	
C	59.50 – 64.49	
C-	54.50 – 59.49	
D+	49.50 – 54.49	
D	44.50 – 49.49	
D-	39.50 – 44.49	<i>Minimum Eligibility Grade</i>
F	0 – 39.49	

Other Grading Information

Detailed instructions of college-level assignments will be posted on the College Canvas Course.

- *Quest Homework*

One Quest HW grade is dropped per semester. 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. Your High School Instructor will extend the assignment under the following circumstances: documented illness, technical issues with Quest, or internet outage. If an extension is granted, you will have 48 hours to complete the assignment. After solutions are posted by your High School Instructor, no further extensions can be given. Your High School Instructor may collect your written work for a portion of the High School grade.

- *Exams*

Unit 1 Exam is not included in the College Grade.

At the end of the fall semester, you will take a fall midterm composed of exams from Units 2 – 4. Unit 4 will be mandatory and serve as a grade in the Unit Exams grading category. Optional retests will be given for Units 2 and 3. Each retest will be the same length and difficulty as the original exam. The higher score between the original exam and the retest will be recorded for the college grade. In the spring, you may elect to take retests on Units 5, 6 and 7 before you take your Final Exam. There is no retest for the Final Exam.

- *Participation*

You will participate in at least one Learning Catalytics module per week, which will determine your participation grade. Participation grades are determined as 85% participating and 15% correctness. Excused absences do not affect your participation grade. A missed Learning Catalytics session due to an absence will appear as a blank in the college gradebook and will not count as a zero.

- You must earn a minimum average grade of D- on college assignments and assessments during the course eligibility period in order to be eligible for the opportunity to earn college credit. If you do not earn a D- or higher, there may be other ways you can gain eligibility. For more information about eligibility, see section **3. COLLEGE CREDIT** below.

F. Missed Work

Missed exams due to unplanned and excused absences will become a zero if the work is not made up within five school days after you return to school. Makeup exams will be a different version from the original exam. Due to the Quest homework drop policy, you will not receive extensions on homework assignments past 48 hours (see Quest Homework policy above). If you know you will miss an exam due to a field trip or extracurricular activity, you are encouraged to arrange a time to take the exam before your absence. In addition, you should plan accordingly and submit your homework before the deadline. This is to promote self-advocacy on your part.

3. COLLEGE CREDIT

This is a college course delivered via distance education through a dual-enrollment program, which means you may earn credit through the UT Austin University Extension for PHY 302K in addition to earning high school credit.

Your high school Instructor is responsible for assigning high school grades and determining high school credit. The UT Austin Instructor of Record is responsible for assigning college grades and determining college course eligibility and credit. High school grades may differ from college grades, even on identical assignments, because of differences in high school and college expectations. Your high school grades and work will not contribute to your college grade.

A. Eligibility for the Opportunity to Earn College Credit

You may become eligible for the opportunity to earn college credit in two ways:

- Eligibility by Grade.** If you meet the minimum eligibility grade on college assignments and assessments completed during the first part of the academic term, you are determined eligible for the opportunity to earn college credit based on your grade.
- Eligibility by Texas Success Initiative (TSI).** If you do not meet the eligibility by grade criteria, you may submit proof of scores on certain standardized assessments, as outlined in the table below, to achieve eligibility by TSI.

Assessment	Subject Area	Minimum Score
TSI	Math	350
SAT (administered on or after March 2016)	Math	530 (No combined score required)
ACT	Composite/Math	Composite score of 23 with at least a 19 on the mathematics test

B. College Credit Process

The table below describes the college credit process. Throughout the year you will access the OnRamps Student Portal (<https://onramps.utexas.edu/portal>) to view information and indicate decisions about your college course enrollment. You can also access FAQs and important dates related to your college enrollment in the OnRamps Portal.

Important Steps and Dates in College Credit Process

Step	Action	Dates
1	<p><u>Eligibility:</u> UT Austin Instructor of Record determines your eligibility for the opportunity to earn UT Austin credit based on grades on college assignments and assessments.</p> <p>Visit the OnRamps Student Portal to find out if you are eligible for the opportunity to earn UT Austin credit.</p>	Monday, January 13, 2020 at 8:00 am CT
2	If you are ineligible for the opportunity to earn UT Austin credit, you may submit TSI documentation for Mathematics to demonstrate college readiness.	Friday, January 17, 2020 at 5:00 pm CT
3	<p>UT Austin Instructor of Record reviews appeals and TSI documentation and makes final determination of whether you are eligible for the opportunity to earn UT Austin credit.</p> <p>If you submitted TSI information, visit the OnRamps Student Portal to find out if you are eligible for the opportunity to earn UT Austin credit.</p>	Friday, January 24, 2020 at 5:00 pm CT
4	<p><u>Final Grade:</u> UT Austin Instructor of Record issues final course grade.</p> <p>Visit the OnRamps Student Portal to view your final grade and find out if you earned college credit.</p> <p><u>Credit Decision:</u> You may elect to accept or decline any college credit earned. If you do not make a Credit Decision during the Credit Decision Period, OnRamps will determine course credit as follows:</p> <ul style="list-style-type: none"> • C- or above: You earned credit and <i>will</i> be issued a UT Austin transcript unless you decline credit in the OnRamps Portal. • D+, D, or D-: You earned credit and <i>will not</i> be issued a UT Austin transcript unless you accept credit in the OnRamps Portal. • F: You did not earn credit and will be withdrawn from the course. You will have no official academic record or transcript for the course at UT Austin. 	<p>Saturday, May 16, 2020 at 8:00 am CT</p> <p>through</p> <p>Wednesday, May 20, 2020 at 5:00 pm CT</p>
5	<u>Transcript:</u> If you earned and accepted college credit, you may request an official UT Austin transcript through the UT Austin Office of the Registrar.	Monday, June 8, 2020

4. POLICIES AND RESOURCES

A. Students with Disabilities

If you receive high-school accommodations related to a disability under the Individuals with Disabilities Education Act (IDEA) or Section 504 of the Rehabilitation Act, you may also receive certain accommodations in your OnRamps distance college course. Accommodations in an OnRamps course must follow accommodations in your Individual Education Plan or 504 Individual Accommodation Plan and be allowable under the university assessment practices. Accommodations are individualized and based on need and disability.

You must make your need for accommodations known to the UT Austin Instructor of Record through the OnRamps Student Portal process prior to the due date for an assignment in order to access accommodations for that assignment. You are strongly encouraged to provide information about your need for accommodations during registration at the beginning of the course or immediately following changes to your Individual Education Plan or 504.

Some examples of college-level accommodations that are allowable depending on the student's need and disability include extended test time (1.5x or 2x allotted time), test administration in a reduced-distraction environment, and permission to use a calculator when calculation is not the skill being assessed.

B. Academic Integrity

OnRamps students are subject to the University's academic integrity policies. Academic integrity is honesty in your academic work. Each student in the course is expected to abide by the University's Honor Code:

“As a student of The University of Texas at Austin, I shall abide by the core values of the University and uphold academic integrity.”

This means that work you produce on assignments and exams is all your own work, unless it is assigned as group work. The UT Austin Instructor of Record or your high school Instructor will make it clear for each assignment or exam whether collaboration is allowed. Refer to **Part E: Assignments and Grading in Section 2** for further details about assignment types in your course.

You are responsible for understanding UT Austin's Academic Honesty Policy which can be found here: http://deanofstudents.utexas.edu/sjs/acint_student.php

You must respond to email requests from OnRamps staff for investigations of potential academic integrity violations. If you fail to respond to email requests about potential academic integrity violations from OnRamps staff, you may receive an academic disciplinary action.

More information about academic integrity may be found in the OnRamps Orientation in Canvas.

Please note that solutions are intended for personal use only. You do not have permission to share or distribute materials, even after the instructor has made solutions available. Sharing, distributing, or posting solutions in physical or electronic format will be treated as an academic integrity violation.

C. Student Code of Conduct

As a participant in the UT Austin OnRamps program, you are expected to uphold a high standard of integrity and ethical behavior. This includes using UT Austin resources in an appropriate, ethical manner for the purpose of learning. Prohibited behavior includes:

- Unauthorized use of institutional technology and services
- Providing false or misleading information about an academic record
- Engaging in violent or disruptive conduct, including hazing, stalking, or behavior that impedes, interferes with, or disrupts any University teaching, research, administrative, disciplinary, public service, learning, or other authorized activity.

Failure to abide by the student code of conduct may result in an academic sanction or removal from the course. For more information about standards of behavior, refer to The University of Texas catalog, Chapter 11, Student Discipline and Conduct: <http://catalog.utexas.edu/general-information/appendices/appendix-c/student-discipline-and-conduct/>

D. FERPA

All students in OnRamps are college students and subject to the federal Family Educational Rights and Privacy Act (FERPA). As a participant in the UT OnRamps program, it is important that you understand these rights as they apply to you.

Under FERPA, university staff may not share information regarding a student's college coursework or academic standing (grade point average, academic transcript, academic probation, or discipline records).

Exceptions:

1. If the student signs a waiver stating that FERPA-protected information may be released to the student's parent/guardian, university staff may share the FERPA-protected information with the parent/guardian.
2. If university staff share FERPA-protected information with high school staff, including the high school Instructor, and the student is under 18 years of age, then the high school staff may share that information with the student's parent or guardian.
3. If university staff suspect a student presents a significant risk of harm to self or others, university staff may disclose FERPA-protected information with a student's parent/guardian, high school Instructor, principal, or other appropriate authority to ensure the safety of the student and/or other individuals.

For more information about FERPA, please visit the U.S. Department of Education: <http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html>

E. Student Grievance Procedures

If you have questions or concerns about your rights and responsibilities as a student in an OnRamps course, or wish to submit a complaint about your experience, you may contact OnRamps Support at support@onramps.zendesk.com or 512-232-6872.