

University of Wyoming
PHYS 1110 Section 02
General Physics I, 4 credits
Lectures: CR 306; Labs: STEM 175; Discussions: ENG 2100
Fall semester 2024

Class Times

Lecture: MWF 10:00–10:50, from 26 Aug 2024 to 6 Dec 2024 excluding university breaks.

Laboratory (You should be registered for *one* laboratory section): Sec 10: T 11:00–12:50; Sec 11: T 1:10–3:00 PM; Sec 12: T 3:10–5:00 PM; Sec 13: T 7:10–9:00 PM; Sec 14: W 11:00 AM–12:50 PM; Sec 15: W 1:10–3:00 PM; Sec 16: W 3:10–5:00 PM.

Discussion (You should be registered for *one* discussion section): Sec 20: T 11:00–11:50 AM; Sec 21: T 3:10–4:00 PM; Sec 22: T 4:10–5:00 PM; Sec 23: W 12:00–12:50 PM; Sec 24: W 2:10–3:00 PM; Sec 25: W 3:10–4:00 PM; Sec 26: R 11:00–11:50 AM.

Instructor

Richard Barrans, Ph.D., M.Ed., Assistant Lecturer, Physics and Astronomy
Physical Science Building room 116, no phone in office, rbarrans@uwyo.edu.
Office Hours: M 3:10–4:10 PM, WF 11:00 AM–12:00 PM, R 2:00–3:00 PM

Teaching Assistants

TBA

Enrollment Restrictions

Prerequisite: MATH 1450, 1405 or equivalent. Students receiving credit for PHYS 1110 cannot receive credit for PHYS 1050, 1210 or 1310.

Course Description

General Physics I is the first semester of a two-semester introductory physics sequence without calculus. It is primarily intended for students aiming for careers in allied health fields and others desiring insight into the physical world. This course is an introduction to the fundamental processes in our universe, including mechanics, gravity, fluids, and heat. Laboratory sessions will illustrate principles studied.

University Studies Program

This course fulfills the Physical and Natural World (PN) requirement of the 2015 University Studies Program. Physical and Natural World (PN) courses will help students understand the fundamental concepts of scientific and quantitative inquiry and develop the ability to understand the fundamental concepts of scientific and quantitative inquiry and develop the ability to understand the relevance of scientific, technological, and quantitative skills to contemporary society. Physical and Natural World (PN) courses will also develop and promote critical and creative thinking skills through active learning, inquiry of pressing issues, and individual and collaborative processing of ideas.

Student Learning Outcomes

Physics & Natural World Student Learning Outcomes

- Understand the principles of the scientific method.
- Formulate and test ideas through analysis and interpretation of the data.
- Use quantitative data analysis as the basis for making critical judgements and drawing conclusions.

Physics & Natural World Critical & Creative Thinking Student Learning Outcomes

- Separate facts from inferences and relevant from irrelevant information, and explain the limitations of information.
- Evaluate the credibility, accuracy, and reliability of conclusions drawn from information.
- Analyze one's own and others' assumptions and evaluate the relevance of context when presenting a position.

General Physics Student Learning Outcomes

- Explain and predict how interactions between objects affect their motion.
- Use principles of conservation to predict how objects behave.
- Construct and apply mathematical models to describe and explain physical phenomena.

Required Materials

Textbook: Serway and Vuille, **College Physics**, 11 Ed. Cengage, 2018, with WebAssign. Available via WyoCourses through StartRight+.

General Requirements and Expectations

Lecture

Since ideas and definitions from the text will be used freely in class, please read and study the assigned chapters before class. I will avoid presenting the exact examples in your text. Instead, class meetings are for addressing the difficult points in the text as well as for helping to place the readings “in the big picture.” The more actively engaged you are in class, the better you will learn and perform. Hence, there will be frequent conceptual questions posed in class—questions that you will be expected to discuss with your neighbors.

Lab

The lab activities are to be completed entirely in lab. Scoring is all-or-nothing: either you get full credit for a lab, or you don't. You should always be able to get full credit, though: if your lab instructor tells you that something is incorrect or missing, just fix it before you leave.

Discussion

In discussion section, you will work physics problems under the guidance of a teaching assistant. This provides an opportunity to practice problem-solving with immediate expert feedback—a valuable learning activity! Discussions are not required, but they are encouraged.

Homework

The assignments will be posted online via the WebAssign platform. Students are encouraged to work together, but each student must submit their own work. The deadline for each homework will be indicated, typically right before the class at which the next homework is assigned. Please check and be mindful of the submission deadlines; they typically won't be at midnight.

WebAssign advice and information:

“Inclusive access” to the textbook and WebAssign is available with StartRight+. I will provide you with registration information.

Internet

Course information and lecture outlines will be accessible through WyoCourses. Supplemental materials, such as lecture slide shows, worksheets, and labs, can also be accessed directly at my website, www.barransclass.com, in case the links in WyoCourses are missing or incorrect.

Required Examinations, Assignments, and Activities

Homeworks and labs will be assigned approximately weekly. There will be four exams, including the final exam, held at the following times:

Exam 1	Thursday, Sep 26	5:10–7:00 PM
Exam 2	Thursday, Oct 24	5:10–7:00 PM
Exam 4	Thursday, Nov 21	5:10–7:00 PM
Exam 4 (Final exam)	Monday, Dec 9	7:00–9:00 PM

Required Participation Outside of Class Meetings

Exams are scheduled for Thursday evenings 5:10–7:00 PM. Let me know as soon as possible of any conflicts you encounter; I'll do my best to accommodate you. Missed standards must be made up on your own time, optimally during my office hours.

Grading Scale and Grading Policies

The final grade will be determined from cumulative points attained. Grading will be on a standard scale (90's = A, 80's = B, 70's = C, 60's = D, < 60% = F). The different components of the course comprise the following fractions of the semester grade:

Item	Percent
Standards	75%
Labs	25%

Standards: Standards are specific skills that I recognize as evidence of mastery of the course content. The list of standards can be viewed from the WyoCourses shell. The quizzes, and the final exam, contain questions that probe your understanding of the standards assessed. Your performance on the questions probing a standard determines whether you satisfy the standard or not. If you satisfy a standard, great! That contributes to your tally of mastered standards.

If you don't satisfy a standard on a quiz, you automatically qualify to try again at the scheduled retest. If you satisfy the standard at the retest, it counts as satisfied with no penalty. If you don't satisfy the standard at the retest, you may retest again, but you must first meet with me or a designee to review the standard and schedule the retest. No retests will be available after the final exam.

Homework: Homework is administered online through the WebAssign platform.

Labs: You must average **at least 60% on the labs** to pass the course. If your lab average is less than 60%, you will receive an F for the course regardless of your scores on the standards.

A note about grades: Your grade in this course reflects your performance over a 15-week period on a limited set of contrived evaluations. It does not reflect your worth as a person or what I think of you. Because of the scope of this course, and because it comprises only a small fraction of your college career, your grade is not a prediction of your future success or an evaluation of your career potential. In short, do not cause yourself (or your instructor) anxiety by making more of your grade than it really is.

Attendance and Absence Policies

Attendance is expected in class sections, and I will record attendance. There is no explicit grade for attendance in lecture or discussion, however. Attendance in lab is required to receive credit for the lab. If you have an excused absence from lab, you may attend another lab session in the same week, we may arrange a make-up lab for you, or the lab may be prorated.

Classroom Behavior Policy

Students are expected to respect others' opinions and abilities, and to help each other during group work activities. Those who repeatedly disrupt the class or interfere with other students' opportunity to learn will be asked to leave the class. If you have a cell phone or any personal audio equipment, ensure that it does not make noise during class, and that it does not create a distraction for your classmates or the instructor. Laptops and tablets are allowed for note-taking purposes. No unauthorized video or audio recording during class is allowed to protect the privacy of your fellow students. If you require recording for accommodation of disabilities, work with Disability Support Services and me to accommodate your needs.

Diversity

The University of Wyoming values an educational environment that is diverse, equitable, and inclusive. The diversity that students and faculty bring to class, including age, country of origin, culture, disability, economic class, ethnicity, gender identity, immigration status, linguistic, political affiliation, race, religion, sexual orientation, veteran status, worldview, and other social and cultural diversity is valued, respected, and considered a resource for learning.

Disability Support

The University of Wyoming is committed to providing equitable access to learning opportunities for all students. If you have a disability, including but not limited to physical, learning, sensory or psychological disabilities, and would like to request accommodations in this course due to your disability, please register with and provide documentation of your disability as soon as possible to Disability Support Services (DSS), Room 128 Knight Hall. You may also contact DSS at (307) 766-3073 or udss@uwyo.edu. It is in the student's best interest to request accommodations within the first week of classes, understanding that accommodations are not retroactive. Visit the DSS website for more information at: www.uwyo.edu/udss. Once UDSS informs me of the accommodations appropriate for you, I will implement them.

Academic Dishonesty Policies

Academic honesty develops respect between faculty and students, ensures fair and effective grading, and creates an environment that fosters learning. Although I encourage you to study with other students, any assignments, exams, and lab submissions must represent your own work.

Academic dishonesty will not be tolerated in this class. Cases of academic dishonesty will be treated in accordance with UW Regulation 2-114. The penalties for academic dishonesty can include, at my discretion, an "F" on an exam, an "F" on the class component exercise, and/or an "F" in the entire course. Academic dishonesty means anything that represents someone else's ideas as your own without attribution. It is intellectual theft – stealing - and includes (but is not limited to) unapproved assistance on examinations, plagiarism (use of any amount of another person's writings, blog posts, publications, and other materials without attributing that material to that person with citations), or fabrication of referenced information. Facilitation of another person's academic dishonesty is also considered academic dishonesty and will be treated identically.

Physics is fun. Involvement in a case of academic dishonesty is not fun.

AI Technology

Students are permitted to use advanced automated artificial intelligence or machine learning tools on assignments in this course if that use is properly documented and credited. For example, text generated by ChatGPT-3 should include a citation such as "Chat-GPT-3. (YYYY, Month DD of query). "Text of your query." Generated using OpenAI. <https://chat.openai.com/>" Material generated using other tools should follow a similar citation convention.

Duty to Report

UW faculty are committed to supporting students and upholding the University's non-discrimination policy. Under Title IX, discrimination based upon sex and gender is prohibited. If you experience an incident of sex- or gender-based discrimination, we encourage you to report it. While you may talk to a faculty member, understand that as a "Responsible Employee" of the University, the faculty member MUST report information you share about the incident to the university's Title IX Coordinator (you may choose whether you or anyone involved is identified by name). If you would like to speak with someone who may be able to afford you privacy or confidentiality, there are people who can meet with you. Faculty can help direct you or you may find info about UW policy and resources at <http://www.uwyo.edu/reportit>.

You do not have to go through the experience alone. Assistance and resources are available, and you are not required to make a formal complaint or participate in an investigation to access them.

Substantive changes to syllabus

Information in the syllabus was, to the best knowledge of the instructor, correct when distributed at the beginning of the term. The instructor, however, reserves the right, acting within the policies and procedures of the University of Wyoming, to make changes in the course content, schedule, or instructional techniques during the term. If any changes to the syllabus become necessary, students will be notified in class, by email, and on WyoCourses. Please check your university email daily.

Student Resources:

- DISABILITY SUPPORT SERVICES: udss@uwyo.edu, 766-3073, 128 Knight Hall, www.uwyo.edu/udss
- COUNSELING CENTER: uccstaff@uwyo.edu, 766-2187, 766-8989 (After hours), 341 Knight Hall, www.uwyo.edu/ucc
- ACADEMIC AFFAIRS: 766-4286, 312 Old Main, www.uwyo.edu/acadaffairs
- DEAN OF STUDENTS OFFICE: dos@uwyo.edu, 766-3296, 128 Knight Hall, www.uwyo.edu/dos
- UW POLICE DEPARTMENT: uwpd@uwyo.edu, 766-5179, 1426 E Flint St, www.uwyo.edu/uwpd
- STUDENT CODE OF CONDUCT WEBSITE: www.uwyo.edu/dos/conduct

Tentative Schedule

Date	Topic	Reading*
08/26	Working with units	1.1–1.7
08/28	Describing motion	1.11–2.3
08/30	Free fall	2.4
Lab	None	
09/02	Labor Day—No class	
09/04	Trigonometry, vectors	1.8–1.10
09/06	Kinematics in two dimensions	3.1
Lab	Measurement	
09/09	Ballistic trajectories	3.2–3.3
09/11	Kinematics problems	
09/13	Newton's laws	4.1–4.2
Lab	Graphs of motion	
09/16	Forces	4.3–4.5
09/18	Friction, Newton's second law problems	4.6
09/20	Inclined coordinates, two-body problems	4.7
Lab	Vectors	
09/23	Uniform circular motion	7.3.2–7.4
09/25	Newtonian gravity, circular orbits	7.5–7.5.1
09/27	Work, power, and simple machines	5.1, 5.7
Lab	Trajectories	
09/30	Work and kinetic energy	5.2
10/02	Gravitational potential energy; Hooke's law	5.3–5.5, 13.1–13.2
10/04	Conservation of mechanical energy	5.6
Lab	Atwood machine	
10/07	Conservative and non-conservative forces	
10/09	Conservation of energy practice	
10/11	Impulse, momentum, conservation of momentum	6.1–6.7
Lab	Pendulum challenge	
10/14	Semester Break—No class	
10/16	Elastic collisions	6.3–6.4
10/18	Collisions in two dimensions	
Lab	Ballistic pendulum	

10/21	Angular kinematics	7.1–7.2
10/23	Torque, statics, center of mass	8.1–8.3
10/25	Newton's second law for rotation, moment of inertia	8.4
Lab	Collisions	
10/28	Rotational work and energy	8.5
10/30	Angular momentum; Kepler's laws	8.6
11/01	Simple harmonic motion	13.3–13.4
Lab	Torque and angular acceleration	
11/04	Simple pendulum	13.5
11/06	Mechanical waves	13.7–13.9
11/08	Wave interference; standing waves	13.10–13.11
Lab	Simple harmonic oscillators	
11/11	Sound waves, intensity, decibel scale	14.1–14.4
11/13	Doppler effect	14.5–14.6
11/15	Sound interference, beats, harmonics	14.8–14.13
Lab	Standing waves	
11/18	Heat and temperature, thermal expansion	10.1–10.3
11/20	Internal energy, specific heat, latent heat	11.1–11.5
11/22	First law of thermodynamics, pV work	12.1–12.3
Lab	Entropy	
11/25	Entropy	12.5
11/27	Thanksgiving Break—No class	
11/29	Thanksgiving Break—No class	
Lab	No lab	
12/02	Heat engines, efficiency	12.4
12/04	Practice	
12/06	Exam review	
Lab	Calorimetry	
12/09	Final exam 7:00–9:00 PM	

*Reading assignments are from the textbook.