PHYS 1220 Section 02, Engineering Physics II, 4 credits
University of Wyoming, Fall Semester 2025
MWF 1:10–3:00 PM, Enzi STEM Building Room 195

What You Really Need to Know

Instructor

Richard Barrans, Ph.D., M.Ed., Assistant Lecturer, Physics and Astronomy
PS 116, no phone in office, rbarrans@uwyo.edu.
Office Hours: PS 116: M 3:10–4:10, T 10:00–11:00 AM, F 11:00 AM–noon;
PS 234: W 7:00–8:00 PM

Teaching Assistant

Eliza Frankel, office hour M 11:00 AM–noon, PS 103 C

Required Materials

Textbook: Mastering Physics with Pearson eText Access Code (18 weeks) for University Physics with Modern Physics, 15th Edition, by Young and Freedman, published by Pearson Addison Wesley. Available via WyoCourses through StartRight+.

Grading scale and grading policy

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). Standards comprise 75% of the course grade, and labs comprise 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 on the course website at barransclass.com. The quiz, midterm exams, and the final exam contain questions that probe your understanding of the standards. Your performance on the questions for a standard determines whether you satisfy the standard or not.

If you don't satisfy a standard on the first assessment, you automatically qualify to try again at the next scheduled retest. If you don't satisfy the standard at the retest, you may continue to retest, but you must meet with me or a designee to review the standard before each retest. I won't keep a record of which standards you have reviewed, just that you have done a review. Reviewing the necessary content is up to you.

There is no penalty for needing more than one try to satisfy a standard. Whenever a standard is satisfied, it receives full credit.

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 nor an evaluation of your career potential. In short, please do not suffer by making more of your grade than it really is.

General requirements and expectations for the course

Attendance Policy

Attendance is expected in class, but there is no explicit grade for attendance. Attendance in a lab is required to receive credit for the lab. If you have an excused absence from lab, we may arrange a make-up lab for you, or the lab may be pro-rated.

It you are absent without excuse from an exam or retest, you receive zero credit.

Late work

Late lab reports will be penalized 5% for every school day late, to a minimum of 50%.

Homework

The assignments will be posted on-line via the MasteringPhysics website, which is integrated with the WyoCourses course shell. Students are encouraged to work together on homeworks, but each student should aim to understand each problem. The due date for each homework will be indicated; typically one week after being assigned. Since homeworks are intended for practice, I intend to leave them open to students after their due dates. If a homework is accidentally closed to you, please let me know and I will try to fix it.

Exams and retests

Exams and retests will be closed book and closed notes. You may use a calculator. You are permitted to bring one 8.5"×11" note sheet with information on both sides to an exam, and a 3"×5" index card to a retest (one card per standard).

If you have a conflict with an exam time, make prior arrangements with the instructor.

Internet

Lecture slide shows, lab instructions, class work sheets, and standards are posted on my personal website, www.barransclass.com.

Required Participation Outside of Class Meetings

Mid-term examinations and standards retests are scheduled for Thursday evenings 5:10–7:00 PM in AG 1030. Thursday evenings are reserved for Calculus exams as well, so the physics and math instructors have coordinated our schedules to avoid conflicts. Let me know as soon as possible of any conflicts you encounter; I'll do my best to accommodate you.

To retest on a standard after its first scheduled retest, you must meet with the instructor or a designee to review the material. This can be during office hours or at another arranged time.

Tentative Schedule

Date	Topic (Standard)	Textbook Reading
08/25	Temperature (1, 2)	17.1–3
08/27	Heat (3)	17.4–17.6
08/29	Heat transfer (4,5), error propagation	17.7
09/01	**Labor Day—No class**	
09/03	Ideal gas EOS, heat capacities (6, 7)	18.1–18.4
09/05	**Lab 1**: Specific heat	
09/08	Phases of matter (8)	18.6
09/10	Thermodynamic paths (9)	19.1–19.3
09/11	**Quiz 1 5:10–6:00 PM, AG 1030**	
09/12	Thermodynamic processes of ideal gases (10)	19.4–19.8
09/15	**Lab 2**: Ideal gas law	
09/17	Entropy (11)	20.5, 20.7
09/19	Entropy (12)	
09/22	Refrigerators and heat engines (13)	20.1–20.4
09/24		
09/25	**Exam 1 5:10–7:00 PM, AG 1030**	
09/26	Electric charge, Coulomb's law (14)	21.1–21.5
09/29	Electric field (15)	21.6
10/01	Gauss's law; conductors (16)	22.1–22.5
10/03	**Lab 3**: Charge distribution	
10/06	Electric potential (17)	23.1–23.5
10/08	Capacitance (18)	24.1
10/09	**Retesting 5:10–7:00 PM, AG 1030**	
10/10	Capacitor geometry (19)	24.2–24.3
10/13	**Semester Break—No class**	
10/15	Dielectric capacitors (20)	24.4–24.6
10/17	**Lab 4**: Capacitance	
10/20	Resistance, resistivity, and Ohm's law (21, 22)	25.1–25.5
10/22		
10/23	**Exam 2 5:10–7:00 PM, AG 1030**	
10/24	**Lab 5**: Resistivity	

10/27	DC Circuits (23)	26.1–26.3
10/29	DC Circuits (24)	
10/31	RC Circuits (25)	26.4
11/03	**Lab 6**: RC time constant	
11/05	Magnets and magnetic field; Lorentz force (26, 27)	27.1–27.3
11/06	**Retesting 5:10–7:00 PM, AG 1030**	
11/07	Magnetic fields of currents (29)	28.1–28.5
11/10	Ampere's law (30)	28.6–28.7
11/12	**Lab 7**: Magnetic field	
11/14	Electromagnetic induction and motional emf (31)	29.1–29.4
11/17	Maxwell's equations, inductors (32, 33)	29.5–29.7
11/19		
11/20	**Exam 3 5:10–7:00 PM, AG 1030**	
11/21	**Lab 8**: Electromagnetic induction	
11/24	Inductors (34), RL circuits (35), transformers (36)	30.1–30.4, 31.6
11/26	**Thanksgiving Break—No class**	
11/28	**Thanksgiving Break—No class**	
12/01	Resonant circuits (37)	30.5
12/03	Practice	
12/04	**Retesting 5:10–7:00 PM, AG 1030**	
12/05	Exam Review	
12/12	**Final exam 1:15–3:15 PM**	