Physics 1120

General Physics II

Class: MTWThF, 9:10 - 10:50 am, Enzi STEM 185

Lab: TWTh, 11:00 - 12:50 pm, Enzi STEM 185

Nikhil Patten

npatten@uwyo.edu
http://physics.uwyo.edu/~nikhil/Courses/PHYS1120/
Office: PS103 (PS122 — personal)
Office Hours: Every day of the week, 1–2 pm.
Phone: (732)-618-6964

The information in this syllabus, apart from grade and absence policies, may change (with notice) as we progress through the semester. These changes will be communicated to you in-person and on Wyocourses.

Course Description: Follows PHYS 1110 and completes introduction to physics without calculus. Includes electricity, magnetism, optics and modern physics. Laboratory sessions illustrate principles studied. Students receiving credit in PHYS 1120 cannot receive credit in PHYS 1050, 1220 or 1320. Prerequisite: PHYS 1110.
Prerequisite: PHYS 1110.
Note: A minimum grade of C is required in this course to pass.
Credit Hours: 4

Text: *College Physics 2e*
Available at: https://openstax.org/details/books/college-physics-2e

Course Objectives:

At the completion of this course, students will be able to:

1. Understand electric charges and electric fields
2. Understand electric potential
3. Design basic circuits
4. Understand magnetism and electromagnetic induction
5. Design and solve optical systems with lenses
6. Understand electromagnetic radiation
7. Know the structure of the atom, and the quantum mechanical selection rules.

Grade Distribution

1. **Participation (10%)** — All or nothing, based on classroom attendance. See **Attendance and Absence** Policy below.
2. **Labs (10%)** — Grade for the lab component of the class. This grade is based on effort.
3. **Homework (30%)** — Average of the six homework assignments in class. Homeworks are due weekly every Friday at 11:59 PM.
4. **Midterm (25%)** — Grade on the midterm exam. Covering topics taught in weeks 1 – 3 in the course.
5. **Final (25%)** — Grade on the final exam. Covering topics taught in weeks 4 – 6 in the course (see schedule below).

Letter Grade Distribution:

>90	A
80 – 90	B
70 – 80	C
60 – 70	D
<60	F

Attendance and Absence

Attendance is required to receive full credit on the participation component of the grade. The participation component of your grade is all-or-nothing and everyone should get this credit. Let me know if you have to‘ miss class.

Classroom Behavior Policy

Treat each other with respect. Learning is collaborative, and we should create a classroom environment in which all are encouraged to ask questions and participate. Phones and laptops are allowed in class, except when taking exams.

Classroom Statement on Diversity

The University of Wyoming values an educational environment that supports students of all backgrounds and viewpoints. Diversity of viewpoints is considered a resource for learning. Topics may be difficult, not only intellectually but emotionally; however, discussions are essential to meeting the course's student learning outcomes and assisting students in developing problem-solving and critical-thinking skills. During all conversations, respect and civility are of utmost importance.

University Disability Support Services

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 accommodation 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 accommodation within the first week of classes, understanding that accommodations are not retroactive. Visit the DSS website for more information.

Academic Dishonesty Policies:

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

AI Technology

Students are not permitted to use advanced automated artificial intelligence or machine learning tools on assignments in this course. Each student is expected to complete each assignment without assistance from automated tools.

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 offer 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 this link. 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.

Tentative Course Outline:
The weekly coverage might change as it depends on the progress of the class.

Week	Content	Lab(s)	Exams
Week 1 (07/07–07/11)	**1.** Vector Review, Temperature (Section 13.1) **2.** Heat (Section 14.1), Temperature Change and Heat Capacity (Section 14.2), Thermal Expansion (Section 13.2), Heat Transfer methods (Section 14.7) **3.** Phase Change and Latent Heat (Section 14.3) **4.** Hooke's Law (Section 16.1), Period and Frequency (Section 16.2), Simple Harmonic Motion (Section 16.3), Simple Pendulum (Section 16.4) **5.** Speed of Sound (Section 17.2), Sound Intensity (Section 17.3), Dopper Effect (Section 17.4).	• Lab 1: Measuring specific heat (Wednesday)	
Week 2 (07/14–07/18)	**1.** Static Electricity and Charge (Section 18.1), Conductors and Insulators (Section 18.2), Coulomb's Law (Section 18.3) **2.** Electric Field (Section 18.4), Electric Field Lines (Section 18.5) **3.** Conductors and Electric Fields in Static Equilibrium (Section 18.7) **4.** E. Potential Energy (Section 19.1), E. Potential in a Uniform E Field (Section 19.2), E. Potential Due to a Point Charge (Section 19.3), Equipotential Lines (Section 19.4) **5.** Capacitors and Dielectrics (Section 19.5), Energy Stored in Capacitors (Section 19.7)	• Lab 2: Equipotential Lines (Thursday)	
Week 3 (07/21–07/25)	**1.** Capacitors in Series in Parallel (Section 19.6), Current (Section 20.1), Ohm's Law (Section 20.2) **2.** Resistance and Resisivity (Section 20.3), Resistors and Series in Parallel (Section 21.1) **3.** Electromotive Force (Section 21.2), Kirchoff's Rules (Section 21.3), DC Voltmeters and Ammeters (Section 21.4) **4.** DC Circuits Containing Resistors and Capacitors (Section 21.6) **5.** ...	• Lab 3: DC Circuits (Thursday)	• Midterm Exam (Weeks 1–3, Friday, 25 July)

Week	Content	Lab(s)	Exams
Week 4 (07/28–08/01)	**1.** Magnets (Section 22.1), Ferromagnets and Electromagnets (Section 22.2), Magnetic Field Lines (Section 22.3), Magnetic Field Strength: Force on a Moving Charge in a Magnetic Field (Section 22.4) **2.** Force on a Moving Charge in a Magnetic Field: Example and Applications (Section 22.5), The Hall Effect (Section 22.6) **3.** Magnetic Force on a Current-Carrying Conductor (Section 22.7), Torque on a Current Loop: Motors and Meters (Section 22.8) **4.** Magnetic Fields Produced by Currents: Ampere's Law (Section 22.9), Magnetic Force between Two Parallel Conductors (Section 22.10) **5.** Induced emf and Magnetic Flux (Section 23.1), Faraday's Law of Induction: Lenz's Law (Section 23.2)	• Lab 4: Magnetic Fields (Thursday)	
Week 5 (08/04–08/08)	**1.** Motional emf (Section 23.3), Eddy Currents and Magnetic Damping (Section 23.4) **2.** The Ray Aspect of Light (Section 25.1), The Law of Reflection (Section 25.2), The Law of Refraction (Section 25.3), Total Internal Reflection (Section 25.4) **3.** Image Formation by Lenses (Section 25.6), Image Formation by Mirrors (Section 25.7) **4.** The Wave Aspect of Light: Interference (Section 27.1), Huygen's Principle: Diffraction (Section 27.2) **5.** Multiple Slit Diffraction (Section 27.4), Single Slit Diffraction (Section 27.5)	• Lab 5: Optics (Wednesday)	
Week 6 (08/11–08/15)	**1.** Discovery of the Atom (Section 30.1), Discovery of the Parts of the Atom: Electrons and Nuclei (Section 30.2), Binding Energy (Section 31.6) **2.** Bohr's Theory of the Hydrogen Atom (Section 30.3) **3.** Nuclear Radioactivity (Section 31.1). Half-Life and Activity (Section 31.5) **4.** Quantum Numbers and Rules (Section 30.8), The Pauli Exclusion Principle (Section 30.9) **5.** ...	• Emission Spectra (Wednesday)	• Final (Weeks 4–6, Friday, 15 August)