Syllabus
UNIVERSITY PHYSICS 212x Spring 2025
4 credits
Calculus-based physics course with weekly assignments (quizzes, homework and labs)
Instructor: Dr. Michael M. Hull
Office: In the Physics Department: Rm 120 REIC. Tel. 907-474-6106 Tel. 474-7339 (Physics office)

Email: mmhull2@alaska.edu. Please allow two business days for a response.
Office Hours: Physics Dept. (Rm. 120): Thursday 10:00-noon (hybrid, online option via Zoom at https://alaska.zoom.us/j/82865533738?pwd=Nml2RjhOSWxSYm9XSUdDNFZKUTBnQT09)

Lectures: REIC 201/Mondays, Wednesdays, and Fridays, 10:30 am - 11:30 am
Class Management System: UAF Canvas

COURSE SPECIFICS:
Prerequisites: Concurrent enrollment in MATH F253X; PHYS F211X or ES F208 or concurrent enrollment in ES F210; placement in WRTG F111X

Course Content:
Physics 212 is a very fast paced course which will cover chapters 1-16 in the free online OpenStax University Physics Vol. 2 text (https://openstax.org/details/books/university-physics-volume-2). My goal for you in this course is not for you to master every nuance of each of these chapters; rather, scientific literacy is the objective. My goal is also for you to develop in your critical reasoning and physics sensemaking as we explore the electric world in which we live, first looking at what causes charge to move, and then discovering the implications of moving charge, in a vast range of contexts including electric heaters, wireless cell phone chargers, and the aurora. The topics covered and tentative schedule is as follows:

Due Friday at 23:59	Homework due on these chapters	Quiz / Exam
1/24/2025	1: Temperature and heat AND 2: Kinetic theory of gases	
1/31/2025	3: First Law of Thermodynamics	Ch1 Quiz AND Ch2 Quiz
2/7/2025	4: Second Law of Thermodynamics	Ch3 Quiz
2/14/2025		Exam1 on Chapters 1-4
2/21/2025	5+6: Electric charges and fields	
2/28/2025	7+8: Electric potential	Ch5+6 Quiz
3/7/2025	9+10: Circuits with resistors	Ch7+8 Quiz
3/21/2025	11+12: Magnetism	Ch9+10 Quiz
3/28/2025		Exam2 on Chapters 5-12
4/4/2025	13+14: EM induction	
4/11/2025	15: AC circuits	Ch13+14 Quiz
4/18/2025	16: EM waves	Ch15 Quiz
4/25/2025	Vol. 3, 10: Radioactivity	Ch16 Quiz
5/1/2025		Final exam on everything

Materials Needed:

- Text: OpenStax University Physics (free)
- Calculator (see below)
- Subscription to ExpertTA as online homework platform (see below)
- Subscription to HonorLock as online exam proctor (see below)

Calculators: **You will need a calculator for homework and exams**. Note that exams are closed-book, and calculators may only be used for mathematical manipulations.

Participation: Research has shown that students learn very poorly from watching lectures, regardless of how coherent or interesting those lectures may be. Learning happens through active involvement ilearning, and effective lectures include frequent "breaks" in which students respond to the content. In this course, students will engage by responding to ConcepTests interspersed in the lectures. To participate in these discussions will require students to prepare for class ahead of time by reading the textbook and/or watching lecture videos. A short Preparation Quiz at the start of Monday's class will ensure that students have prepared for class. Furthermore, a few lectures will be replaced with group-based learning modules (Tutorials) for which your attendance is required. Other than the Preparation Quizzes, the 5% participation grade will NOT be based upon correctness of responses, but rather upon engagement with the ConcepTests and Tutorials.

Homework: The homework is web-based and accessed through TheExpertTA (https://theexpertta.com/) **(costs approximately $50)**. Homework will be due once a week on Friday (at 11:59PM). Education research has shown that students learn best when they receive prompt feedback on their work. Solutions to homework will be visible on ExpertTA immediately after the due date; consequently **NO LATE HOMEWORK WILL BE ACCEPTED**. For extenuating circumstances (medical emergencies, etc.), please email me.

Note: Working in study groups on the homework is encouraged, but take care that you walk away with a personal understanding that you will be able to demonstrate on the quizzes and exams (which are taken individually).

Quizzes: There will be an online quiz due together with homework on many Fridays. The quizzes will be timed. These quizzes will be administered via GradeScope or ExpertTA. You may create your own equation sheet on a single-side of an A4 sheet of paper, or you may use the provided equation sheet. You may use your calculator for algebraic manipulation on the quizzes. Other than these aids, you are to take the quizzes alone without other assistance. The primary goal of these quizzes is to identify course content that you are struggling with, so you can better prepare for the exams.

Exams: All exams are closed book and will be proctored online via HonorLock (approximately $15). If you are in a location with unsteady internet, you may use an in-person proctoring similar to eCampus' Testing Services (for example, you might ask the library). Like with the quizzes, you may use an equation sheet and your calculator for algebraic manipulation on the exams, but are otherwise to take the exams alone without other assistance. Violation of this constitutes a breach in the UAF Honor Code and will be dealt with appropriately. Exams will include mostly problems with some short answer and multiple choice. They will cover concepts and examples from the text, lecture material, homework problems, recitation problems and laboratory exercises. Solutions to exams will be posted on Canvas.

Exam Dates:

Exam 1: **Feb. 14th** (covering Chapters 1-4 tentatively)
Exam 2: **March 28th** (covering Ch. 5-12 tentatively)

Final Exam: Thursday May 1st: Roughly 1/2 covering chapters 13-16 and Vol.3 Ch10

Each exam will last two hours. You may take the exams at any point during the designated days.

Laboratory: This course includes a three-hour lab. You must pass the lab in order to pass the course. **Students who do not complete at least nine of the ten labs and submit the corresponding lab reports will automatically fail the lab (and, hence, the course).** The lowest lab grade will be dropped.

There is a makeup lab week at the end of the semester, but labs may only be made up if excused and with permission of the lab supervisor, Joe Storm:
jhstorm@alaska.edu
Questions about the lab should be directed to the teaching assistant in charge of your lab or to the lab supervisor.

April 18th is the last day lab reports will be accepted and graded!

Grading:
Grades given will be on a five step A-F scale (with + /- grades assigned if appropriate) The final, cumulative scores will be curved and final grades assigned on that basis, however, a final percentage score of 90% or above will an be at least an A-, 80% will be at least a B-, 70% at least a C-, and 60% at least a D-.

Midterm Exam 1	15%
Midterm Exam 2	15%
Quizzes (9)	20%
Final Exam	18%
Homework (12)	12%
Participation (Preparation Quizzes, Tutorials, ConcepTests)	5%
Lab (10)	15%
Total	**100%**

The lab component of this course (15%) and participation points (5%) do not appear in the Phys212X Canvas page and so the column "Total" you see in the far right of Grades accounts for only 80% of your course grade. To calculate your grade in Physics 212, do the following:
"Total" column in Phys211X * 0.8
+ Lab grade (from Phys211L Canvas page) * 0.15
+ 0.05 (assuming you have participated in the Tutorials and ConcepTests and have correctly answered the Preparation Quizzes)

For your reference, the weightings leading up to the "Total" column in Phys212X are:
Homework (12% of the course) --> 15% of 80%
Quizzes (20%) --> 25% of 80%
Exams (Exam 1, Exam 2, and Final) (48%) --> 60%

SUPPORT SERVICES

Lab TA's
TBD
Office: REIC. 128 or REIC. 126
TA Office Hours Spring 2025

Weekly Homework Help Sessions: We will hold Online Help Sessions via Zoom. On campus, you can drop by my office and/or make an appointment. The Physics Department also holds Homework help sessions in the Physics conference room (REIC 122). The schedule is here:
HW Help Spring 2025

Noyes Lab Access:
Every student enrolled in a physics course is given access to the Noyes Computer Lab in REIC 101. Computers with logger pro software, a scanner and a printer are available here. You may access the room by swiping your PolarExpress card. If you are unable to gain access to the room, please contact Liya Billa, Physics Office Manager, in the physics front office (REIC 102), or at lkbilla@alaska.edu.

UAF eCampus Student Services
Student Services helps students with registration and course schedules, provides information about lessons and student records, assists with the examination process, and answers general questions. Our Academic Advisor can help students communicate with instructors, locate helpful resources, and maximize their distance learning experience. Contact the UAF eCampus Student Services staff at 907.455.2060 or toll free 1.800.277.8060 or contact staff directly – for directory listing see: http://ecampus.uaf.edu/contact

Office of Information Technology Help Desk
Go to http://www.alaska.edu/oit/ to see about current network outages and news.
Reach the Help Desk at:

- e-mail helpdesk@alaska.edu
- fax: 907.450.8312
- phone: 450.8300 (in the Fairbanks area) or 1.800.478.8226 (outside of Fairbanks)

UAF Writing Center
The writing center offers writing tutoring to students, staff, faculty and the wider community in any discipline, 6 days/ week. They also offer phone tutorials.

CTC Learning Center
The Learning Center offers tutoring in writing and math. For hours of operation and information about online tutoring for writing, check their website.

UAF Math Lab
The math lab offers tutoring to students at all levels.

UAF Library
The Rasmusen Library reference help desk is available to assist students with library research and other questions.

Student Support Services
Find help with advising, tutoring, mentoring, course selection, financial aid, career advising and more at Student Support Services. **https://www.uaf.edu/sss/**

Special Needs
The office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. We work with the Office of Disabilities Services (203 WHIT, to 474-7043) to provide reasonable accommodation to students with disabilities.

Plagiarism and Cheating: Plagiarism and cheating are matters of serious concern for students and academic institutions. I take it seriously as well. Quizzes and Exams are to be your work ONLY! with no help from others or online resources. The UAF Honor Code (Student Code of Conduct) defines the academic standards expected at UAF and is adhered to in this class as well.

Complaints and concerns: I encourage you to talk to me about concerns you have with the class etc., however, if the situation warrants, you can contact the Physics Department Chairman, Dr. Martin Truffer at mtruffer2@alaska.edu or 474-5359.

Last Day to Drop this Class (refunded, course does not appear on academic record): Jan. 24
Last Day to Withdraw from this Class: March 28