

Syllabus

COLLEGE PHYSICS 124x Spring 2024

4 credits

Online asynchronous 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>)

Lab TA

TBD

Office: REIC. 126

TA office hours

https://docs.google.com/document/d/18Bnwkw1lXfZJGw8ckZiNc-WsaZGgT_NZuESQhTSdc4/edit?usp=sharing

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:

<https://docs.google.com/document/d/1OmbYQLD6Ad-6oVQfjYyGJ427zESodJJDSbWfYJO2CFY/edit?usp=sharing>

Class Management System: UAF Canvas

COURSE SPECIFICS:

Prerequisites: Physics 123 or equivalent, or permission of the instructor

Course Content:

Physics 124 is a very fast paced course which will cover chapters 18-34 in the free online OpenStax Physics text (<https://openstax.org/details/books/college-physics>). The course emphasizes critical reasoning and sensemaking in physics. The topics covered and tentative schedule is as follows:

Due Friday at 23:59	HW #	Homework due on these chapters	Quiz / Exam
1/26/2024	1+	18: Charge and electric field + 19: Electrical potential	
2/2/2024	2		
	3	20+21: Circuits with resistors	Quiz 1 on Chapter 18 + Quiz 2 on Chapter 19
2/9/2024	4	22: Magnetism	Quiz 3 on Chapters 20+21
2/16/2024			Exam1 on Chapters 18-22
2/23/2024	5	23: EM induction and AC circuits	
3/1/2024	6	24: EM waves	Quiz 4 on Chapter 23
3/8/2024	7	25+26: Lenses and mirrors	Quiz 5 on Chapter 24
3/22/2024	8	27: Wave optics	Quiz 6 on Chapters 25+26
3/29/2024			Exam2 on Chapters 23-27
4/5/2024	9	29: Quantum physics	
4/12/2024	10	30+31: Radioactivity	Quiz 7 on Chapter 29
4/19/2024	11	32: Nuclear physics	Quiz 8 on Chapter 30+31
4/26/2024	12	33+34: Particle physics and beyond	Quiz 9 on Chapter 32
4/30/2024			Final exam

Materials Needed:

Required Text: *OpenStax Physics (free)*

Laboratory Kit from Hands on Labs (refer to the lab Canvas site, PHYS124L, for details)

Calculators: **You will need a calculator for homework and exams.** A basic, simple scientific calculator with trigonometric, exponential, and logarithmic functions is all that you need but buy a fancy one if you want – just learn how to use it! Note that exams are closed-book, and calculators may only be used for algebraic manipulations.

Participation: Research has shown that students learn very poorly from watching lectures, be they in person or online. Learning happens through active involvement in learning, and effective lectures include frequent "breaks" in which students respond to the content. In this course, students will do this by responding to ConcepTests interspersed in the recorded lectures. The recordings are within Canvas, and students will submit responses directly into the videos themselves. The participation grade will NOT be based upon correctness of responses, but rather upon engagement with the ConcepTests.

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). Solutions will be visible on ExpertTA immediately after the due date; consequently **NO LATE HOMEWORK WILL BE ACCEPTED.**

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 your public 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. 16th (covering Chapters 18-22 tentatively)

Exam2: March 29th (covering Chapters 23-27 tentatively)

Final Exam: Tuesday April 30th (Roughly 1/2 covering chapters 18-27 and the rest covering chapters 29-34)

Laboratory: There is a lab associated with this course that is vital for your learning of the content. You will need to purchase the lab kit. The Lab TA will be available to guide you in performing the laboratory kit experiments. ALL LABS MUST BE COMPLETED TO GET A PASSING GRADE FOR THIS COURSE (10 total).

April 19th 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 be at least an A-).

Midterm Exam 1	15%
Midterm Exam 2	15%
Quizzes (9)	20%
Final Exam	20%
Homework (12)	12%
Participation	3%
Lab (10)	15%
Total	100%

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. 26

Last Day to Withdraw from this Class: March 29