PHYS S123: College Physics I

Fall 2025

Instructor: Jason Amundson
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Class hours: MWF 10:45 am – 11:45 am

Lab hours: J01, T 8:45 am – 11:45 am
J02, T 1:15 pm – 4:15 pm

Office hours: MWF 12:00 pm – 1:00 pm, or by appointment

Website: A course website will be maintained on Blackboard (http://classes.alaska.edu). Check for assignments, handouts, grades, and messages.

Prerequisites: MATH S152

Textbook: College Physics: A Strategic Approach (4^{th} ed.) by Knight, Jones, and Field. Be sure to purchase a version of the book that comes with an access card for MasteringPhysics, which you will use for homework submissions.

The cheapest option is to purchase the MasteringPhysics with Pearson eText package (ISBN-13: 978-0-13-470393-0 for 24-month access; ISBN-13: 978-0-13-678221-6 for single-term access). If you prefer, you can also order a package that includes a bound copy of the textbook.

To access MasteringPhysics, follow the link from the course Blackboard site and click "Open MyLab and Mastering". From there you will need to enter the access code that you received when you purchased the textbook.

Other materials: A basic scientific calculator with trigonometric, exponential, and logarithmic functions. Calculators can be used during exams.

Student Learning Outcomes

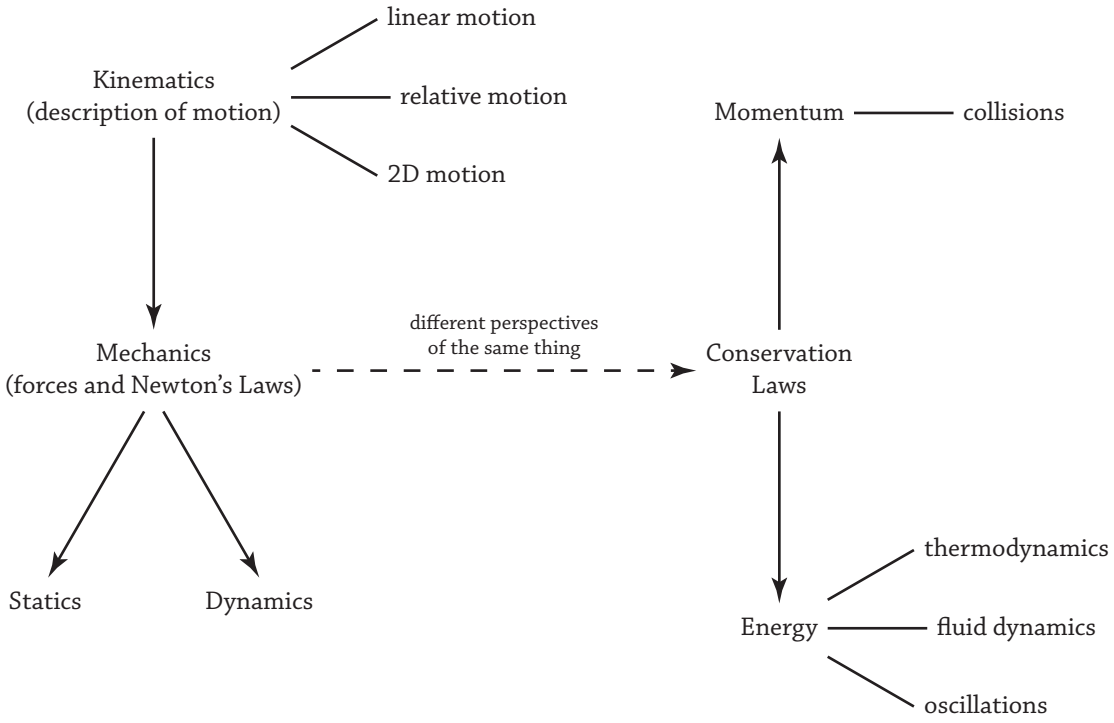
Upon successful completion of this course, students will be able to:

1. Demonstrate an understanding of the basic laws of physics in classical mechanics and thermodynamics.
2. Apply these physics laws to understand physical phenomena and technological applications.

3. Demonstrate quantitative physics problem solving skills through the application of algebra and critical physics thinking.
4. Describe the societal relevance of physics and its connection to other fields of science.
5. Safely use basic laboratory equipment, develop a testable hypothesis, systematically collect and analyze data, and report and interpret experimental results.

Physics is the study of matter and its motion through space and time. In PHYS S123 we will cover the field of classical mechanics, which pertains to "large" objects that are moving much slower than the speed of light.

Concepts



Grading

Homework assignments	20%
Informal lab reports (8)	20%
Formal lab reports (2)	15%
Exams (3)	45%

Homework

There will be 10 homework assignments consisting of roughly 10 problems each. You will submit your solutions through MasteringPhysics. Late assignments will only be accepted for extenuating circumstances.

Why use MasteringPhysics?

- It gives you wrong-answer feedback and hints for solving problems.
- It provides me with diagnostics on what types of problems are giving you the most trouble.

A few suggestions for working through the homework:

- Work through your answers slowly and be sure to check for significant figures before entering your solution. You might consider solving all of the problems before entering your answers so that you don't get frustrated right away.
- If you feel confident in your answer, but MasteringPhysics tells you that your answer is incorrect and doesn't give you useful feedback, send me an e-mail. View this as an opportunity to figure out what you did wrong and correct your mistake before the due date.
- I view the homework as training for the exams, and in that sense the homework grade is essentially participation. I'm happy to help you work through problems all the way to the final solution if you are having trouble.
- I reserve time in class each week to address questions related to the homework, so come with questions!

Lab reports

There will also be 10 laboratory exercises during the semester. You will be expected to turn in informal reports for eight of the labs and formal reports for the other two. For the informal reports you may submit a group report (no more than three people in a group) but are not required to do so. For the formal reports I expect you to submit an individual report. More details to follow. You may submit physical or electronic copies of your reports; if you choose to submit a report electronically you should do so by uploading it to Blackboard.

Lab reports will not be considered late up until the point that I grade them; afterwards they will be docked by 50%. This late policy is designed to (1) encourage you to finish your reports even if they were not completed before the due date and (2) simplify my grading. I don't like taking off points for late work, especially if I am slow at grading it, but it is also much easier to grade everybody's work at once. I think this policy is a good compromise.

Exams

You will be given three exams during the semester, including the final exam. The exams will focus on the material that was covered over the previous third of the semester, but they are cumulative

in the sense that everything that we do in physics will be built up from the same core principles. The exams will be proctored in the Learning Center. You will have several days to complete them. The exam scores will be curved.

Grading Scale

A	93–100%
A-	90–92%
B+	87–89%
B	83–86%
B-	80–82%
C+	77–79%
C	73–76%
C-	70–72%
D+	67–69%
D	63–66%
D-	60–62%
F	<60%

Student Ratings of Instruction

During the last three weeks of class, you will have an opportunity to complete an online rating questionnaire on course instruction, how the course aided in your skill development, effectiveness of technology and equipment used, and adequacy of library resources and services used during the course. You will receive notification in your UAS email account when the rating questionnaire is available. Please make use of this opportunity to provide feedback on what worked for you and what did not. Your input is used to assess methods and services in order to provide the best educational experience possible.

Disabilities

If you experience a disability and would like information about support services, please contact Disability Services, located at the Student Resource Center in the Mourant building. They can be reached at 796-6000. For more information, please see http://www.uas.alaska.edu/dss/index.html.

Title IX/Sexual Misconduct

All students have the right to be free from all forms of gender and sex-based misconduct (sexual harassment, dating violence, domestic violence, sexual assault, or stalking). Please report any incidence of sex or gender-based discrimination to the UAS Title IX Office: `https://uas.alaska.edu/equity-and-compliance/titleix/index.html`

Schedule (subject to change):

Monday	Tuesday	Wednesday	Friday
8/25 Course overview: why physics?	8/26 No lab	8/27 1.1–1.6: Introduction to kinematics	8/29 2.1–2.6: Kinematic equations
9/1 Labor Day	9/2 Lab #1: Measurements and motion	9/3 3.1–3.3, 3.5: Motion in two dimensions **HW #1 due**	9/5 3.4–3.6: Motion in two dimensions, ctd.
9/8 3.8: Relative motion	9/9 Lab #2: Acceleration **Lab #1 due**	9/10 3.7, 6.1: Circular motion **HW #2 due**	9/12 7.1–7.2: Rotational motion
9/15 Circular and rotational motion, ctd.	9/16 Lab #3: Forces **Lab #2 due**	9/17 4.1–4.7: Newton's Laws	9/19 5.3–5.4, 5.8, 6.6: Types of forces, I
9/22 No class	9/23 Review for exam #1 **Lab #3 due**	9/24 5.5: Types of forces, II **HW #3 due**	9/26 **Exam #1** Testing Center
9/29 5.6, 8.3: Types of forces, III	9/30 Lab #4: Circular motion (formal report)	10/1 6.3–6.4, 6.6: Centripetal forces	10/3 7.3–7.4: Torque
10/6 7.5–7.7: Torque, II	10/7 Lab #5: Torque **Lab #4 due**	10/8 8.1–8.2 Static equilibrium **HW #4 due**	10/10 8.4: Equilibrium and elasticity
10/13 9.1–9.3: Impulse and momentum	10/14 Lab #6: Statics **Lab #5 due**	10/15 9.4–9.6: Conservation of momentum **HW#5 due**	10/17 9.7: Angular momentum

Monday	Tuesday	Wednesday	Friday
10/20 10.1–10.2: Work and energy	10/21 Lab #7: Momentum and energy **Lab #6 due**	10/22 10.3–10.5: Types of energy **HW#6 due**	10/24 10.6–10.7: Types of energy, II
10/27 11.1, 11.4–11.7, 12.5: Introduction to thermodynamics	10/28 Review for exam #2	10/29 12.6: Applications of thermodynamics **HW #7 due**	10/31 **Exam #2** Testing Center
11/3 12.8: Heat transfer	11/4 Lab #8: Springs (formal report) **Lab #7 due**	11/5 12.2–12.4, 12.7: Thermodynamics of gases	11/7 13.1–13.2: Introduction to fluids
11/10 13.3: Archimedes' principle	11/11 No lab	11/12 13.4–13.5: Fluid dynamics, I **HW #8 due**	11/14 13.6–13.7: Fluid dynamics, II
11/17 14.1–14.5: Oscillations	11/18 Lab #9: Pendulums **Lab #8 due**	11/19 14.6–14.7: Driven and damped oscillations **HW #9 due**	11/21 15.1–15.3: Introduction to waves
11/24 15.4–15.7: Traveling waves	11/25 Lab #10: Sound **Lab #9 due**	11/26 Fall break	11/28 Fall break
12/1 16.1–16.3: Wave superposition	12/2 Review for exam #3 **Lab #10 due**	12/3 16.4–16.5: Sound **HW #10 due**	12/5 TBD
12/8 Exam #3 - - - - - - - - Testing center	12/9 - - - - - - - - - - - - - - - -	12/10 - - - - - - - - - - - - - - - -	12/12 - - - - - - - - - - - - - - >