

PHYS S123: College Physics I

Fall 2021

Instructor: Jason Amundson
225 Whitehead Building
jmamundson@alaska.edu
phone: 796-6247

Class hours: MWF 10:45 am – 11:45 am, Egan Wing 218

Lab hours: J01, T 8:45 am – 11:45 am, Whitehead 101
J02, T 1:15 pm – 4:15 pm, Whitehead 101

Office hours: MWF 9:30 am – 10:30 am, or by appointment

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

Prerequisites: MATH S152

Textbook: College Physics: A Strategic Approach (4th 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.

When you register for the MasteringPhysics course that I have set-up, you will need to use the Access Code that you purchased and enter the course ID: PHYS123Amundson2019.

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

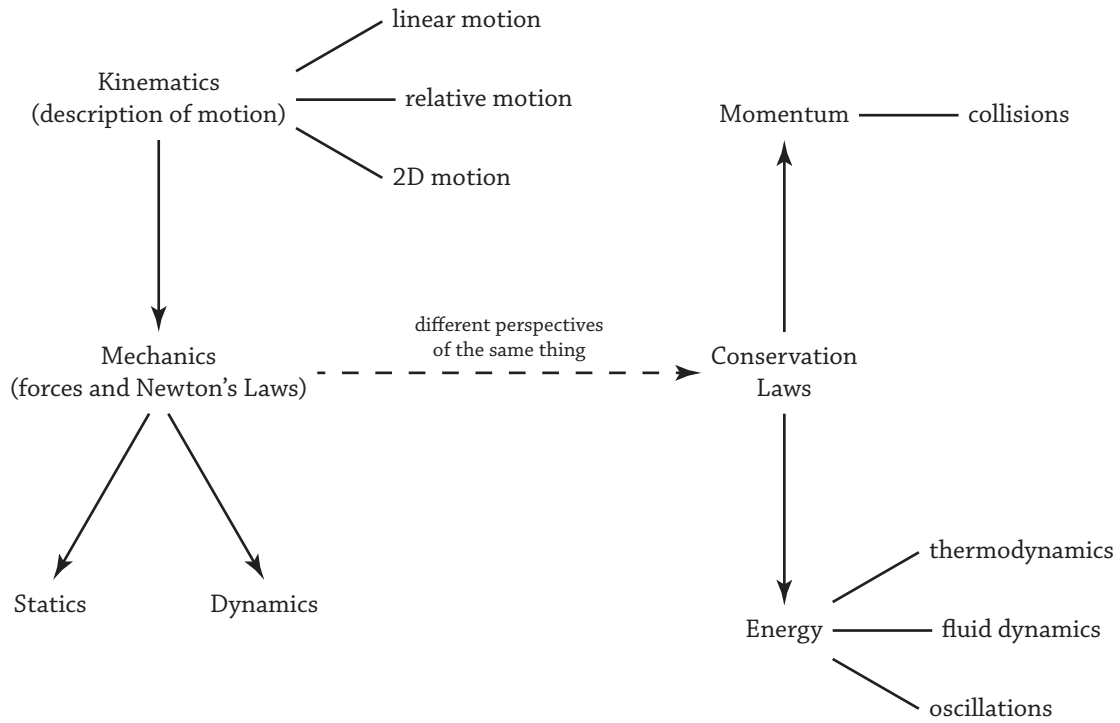
Student Learning Outcomes

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%

Most scientific projects are collaborative; this course is no different. I encourage you to work together on homework assignments and laboratory exercises.

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, come talk to me or 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, which is an option that you wouldn't have with paper submissions.
- I view the homework as training for the exams and therefore I'm willing to help you work through problems all the way to the final solution if you are having trouble.

There will also be 10 laboratory exercises during the semester. You will be expected to turn in informal reports for eight of the exercises and formal reports for two of the exercises. The informal reports may be written as a group but each person should submit the report through Blackboard. Formal lab reports must be written individually. The reports will be due one week after the lab exercises unless otherwise noted. Lab reports will not be considered late up until the point that I grade them; afterwards they will be given a maximum grade of 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.

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%

General Comments

My job is to help you learn. If you are uncomfortable in the classroom or have any other comments and concerns, please do not hesitate to contact me.

When I'm in the office I'll try to respond to your phone calls and e-mails as quickly as possible. Any messages sent to me in the evening or on weekends will likely not be addressed as quickly.

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 Support Services, located at the Student Resource Center in the Maurant 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: 796-6371 or email uas.title9@alaska.edu. More information and resources are available at <http://www.uas.alaska.edu/policies/titleix.html>.

Schedule (subject to change):

MONDAY	TUESDAY	WEDNESDAY	FRIDAY
8/23 Course overview: why physics?	8/24 Lab #1: Measurements and motion	8/25 1.1–1.6: Introduction to kinematics	8/27 2.1–2.6: Kinematic equations
8/30 3.1–3.3, 3.5: Motion in two dimensions	8/31 Lab #2: Acceleration Lab #1 due	9/1 3.4–3.6: Motion in two dimensions, ctd. HW #1 due	9/3 3.8: Relative motion
9/6 Labor Day	9/7 Lab #3: Forces Lab #2 due	9/8 3.7, 6.1: Circular motion HW #2 due	9/10 7.1–7.2: Rotational motion
9/13 No class (tentative)	9/14 No lab (tentative)	9/15 No class (tentative)	9/17 Circular and rotational motion, ctd.
9/20 4.1–4.7: Newton's Laws	9/21 Review for exam #1	9/22 5.3–5.4, 5.8, 6.6: Types of forces, I HW #3 due	9/24 Exam #1 Testing Center
9/27 5.5: Types of forces, II	9/28 Lab #4: Circular motion (formal report) Lab #3 due	9/29 5.6, 8.3: Types of forces, III	10/1 6.3–6.4, 6.6: Centripetal forces
10/4 7.3–7.4: Torque	10/5 Lab #5: Torque Lab #4 due	10/6 7.5–7.7: Torque, II HW #4 due	10/8 8.1–8.2 Static equilibrium
10/11 8.4: Equilibrium and elasticity	10/12 Lab #6: Statics Lab #5 due	10/13 9.1–9.3: Impulse and momentum HW #5 due	10/15 9.4–9.6: Conservation of momentum
10/18 9.7: Angular momentum	10/19 Lab #7: Momentum and energy Lab #6 due	10/20 10.1–10.2: Work and energy HW #6 due	10/22 10.3–10.5: Types of energy

MONDAY	TUESDAY	WEDNESDAY	FRIDAY
10/25 10.6–10.7: Types of energy, II	10/26 Review for exam #2	10/27 11.1, 11.4–11.7, 12.5: Introduction to thermodynamics HW #7 due	10/29 Exam #2 Testing Center
11/1 12.6: Applications of thermodynamics	11/2 Lab #8: Springs (formal report) Lab #7 due	11/3 12.8: Heat transfer	11/5 12.2–12.4, 12.7: Thermodynamics of gases
11/8 13.1–13.2: Introduction to fluids	11/9 No lab	11/10 13.3: Archimedes' principle HW #8 due	11/12 13.4–13.5: Fluid dynamics, I
11/15 13.6–13.7: Fluid dynamics, II	11/16 Lab #9: Pendulums Lab #8 due	11/17 14.1–14.5: Oscillations HW #9 due	11/19 14.6–14.7: Driven and damped oscillations
11/22 15.1–15.3: Introduction to waves	11/23 Lab #10: Sound Lab #9 due	11/24 No class	11/26 Thanksgiving holiday
11/29 15.4–15.7: Traveling waves	11/30 Review for exam #3 Lab #10 due	12/1 16.1–16.3: Wave superposition	12/3 16.4–16.5: Sound HW #10 due
12/6 Exam #3 Testing Center	12/7	12/8	12/10