University Physics

CALIFORNIA COMMUNITY COLLEGES ONLINE EDUCATION INITIATIVE

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# Course Overview

**Course Code and Semester**: **Physics 4B, Class Number 40985, Fall 2022**
**Course Description**: Comprehensive study of major topics of physics: Thermodynamics, electric forces and fields, magnetic forces and fields, electricity, and AC and DC circuits. (Satisfies COA AA/AS area 1; CSU area B1 and B3; IGETC area 5A and 5C; transferable to CSU and UC)
**Prerequisites**: Physics 4A and Math 3B
**Co-requisite**: Math 3C

**Who should take this course?**

- Intended physical science and engineering major students
- Interested students who wish to learn how calculus is used to describe the physical theory of electromagnetism.

If you are taking Physics 4B to meet a transfer requirement, please check with your transfer institution and department. Physics 4B is the second semester of three-semester calculus-based general physics. Most physical science and engineering majors require Physics 4B; biological science majors may wish to explore Physics 3 sequence, which is two semesters of calculus-based general physics.

# Student Learning Outcomes

1. Discuss the concepts of physics, and apply them to situations relevant to the course.
2. Develop descriptions of physical systems using mathematics and calculate measurable quantities.
3. Set up laboratory equipment safely, Plan and carry out experimental procedures, Identify possible sources of error, Reduce and interpret data, and Prepare clear written reports.

# Instructor Information

Hi! My name is **Andrew Park**. The best way to contact me for course-related matters is through Canvas **Conversations** tool (for non-course matters, best way is by email: **bpark@peralta.edu (mailto:bpark@peralta.edu)** ). You will hear from me regularly throughout the semester, usually through the **Course Announcements**. If you need to talk (rather than write) to me individually, please see office hour information below.

## Lab Sessions

This **hybrid** course has 100% online lecture section and 100% face-to-face lab section. The lab sessions are scheduled for **Tuesdays in ATLAN 100 from 6 p.m. to 9 p.m.**, in Peralta Science Annex at 860 Atlantic Avenue. Please see **COVID-19 safety guidelines (https://safe.peralta.edu/covid19-student-resources)** on safe.peralta.edu and follow those instructions each time you attend lab.

## Office Hours / Virtual Class Sessions

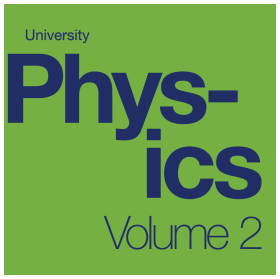
Following are office hours and virtual class session schedule for Fall 2022 *[Last Updated September 19]*.

Online virtual class session (attendance-optional; most of it recorded) is held on **Thursdays at 6 p.m. until October 13**; starting with October 21, it will be held on Fridays at 11 a.m. Reminder and agenda of the session is announced earlier in the day.

In-person office hours will be held in **ATLAN 100 (Physics Lab Room) on Tuesday 5-6 p.m. and Wednesday 4-6 p.m.** Drop by with any questions, or just to work on course content using the building WiFi. For online availability during in-person office hours, please message or email me requesting online join information. Please allow up to 30 minutes for your request to be responded to.

For appointments outside of regularly scheduled office hours, please email me to arrange for the time. I usually respond to appointment request emails within 24 hours, and often sooner (sooner for physics-related questions, as long as they are being sent during normal business hours; I may wait until next morning to answer "last minute" questions being asked a few hours before midnight).

# Course Materials




Your course materials are free and available digitally. Our primary and required textbook is *University Physics Volume 2* by OpenStax. You can read it by:

- Accessing it online on **openstax.org (https://openstax.org/books/university-physics-volume-2/pages/1-introduction)** .
- Downloading the **PDF (https://assets.openstax.org/oscms-prodcms/media/documents/UniversityPhysicsVolume2-WEB_5eNhMSa.pdf)** (about 59 MB), or
- Using additional access options on **OpenStax (https://openstax.org/details/books/university-physics-volume-2)** .

Relevant textbook sections will be linked to from the Canvas pages, along with additional materials on as-needed basis. Once we start electromagnetism, we will frequently refer to one particular resource, **The Portable T.A. Volume 2** by Andrew Elby (posted here with author's permission).

# Important Notes

## Grading Contract

One traditional item you will not see in this syllabus is a detailed grading breakdown for how course letter grade will be assigned. This is primarily because there isn't enough space on this syllabus to adequately describe the grading arrangement for this class. The detailed description is given on course Canvas page, **Physics 4B Grading Contract** (may need to unlock Module requirements to access the page).

A short, admittedly inadequate description I can give here is this: we keep scores for course item completion and evidence of effort only (80% weight for lecture items; 20% weight for lab items). For the assignment of a course letter grade, you will tell me (in special-purpose Canvas Assignments set aside for this) what grade you think you should get, and we will attempt to come to a consensus—between how well you feel you understood physics and how much of that I see as your instructor.

## ADA Accommodation

Students who may need accommodation for their disabilities are encouraged to contact **Student Accessibility Services (https://alameda.edu/students/student-accessibility-services-sas/)** as soon as possible in the semester so that reasonable (and *legally mandated*) accommodations may be made. The contact information is at the bottom of the SAS website (if you are in a hurry, this is their email: **SAS.Alameda@peralta.edu (mailto:SAS.Alameda@peralta.edu)** ). Usual accommodations made include extended exam time and/or transcription service. Most students with a diagnosed learning disability (such as ADHD or ADD) are eligible. If you are not sure whether you are eligible, please check with a SAS counselor. The details regarding the nature of your disability are confidential and not shared with your instructor.

*Instructor's personal note: In my experience, many students who SHOULD HAVE utilized this service do not use them and suffer consequences academically. The goal of SAS (and ADA in general) is that you should be judged on your ABILITY, not disability. For those students who are eligible, the ADA accommodation is what will help you express your full potential (not a special treatment or something to be stigmatized against).*

*Talk to a SAS counselor today; the worst that can happen is they will tell you that you are not eligible and you wasted a little bit of time.*

## Tutoring and Academic Support

For tutoring support during COVID-19, please check **Learning Resources Center (https://alameda.edu/students/learning-resources-center-lrc/)** website for access information.

Additional online tutoring may also be available through Online Tutoring link in Canvas course sidebar. Please let me know if there are any issues in accessing any of these academic support services, so that I can help.

## Preferred Names and Pronouns

Please help me refer to you in the way you prefer by completing following two things at the beginning of the semester:

- **[GRADED DISCUSSION] Introduce Yourself** (also accessible from Modules, may need to complete Module requirements to access)
- Name Coach entry (see Canvas course sidebar).

I will always do my best to pronounce your name correctly and refer to you with respect. Please help me do that by correcting me if I mispronounce your name—or any other mistakes I may make unwittingly in how I refer to you.

## Additional Advice

In the remainder of this syllabus, you will see course policies and other additional detail that may be good to know. But in terms of how you can best prepare yourself for *success* in this class, additional advice is given throughout the Canvas module, **Getting Started**. So, please, work through the **Getting Started** module in the first couple days of the semester (or as soon as you can).

## Calendar and Assignments

The **Modules** view in Canvas shows all course materials, assignments, and due dates on a single page. The **Canvas Calendar** will be used to manage appointments for certain things; reminders of Zoom sessions (mostly virtual class sessions, an office-hour replacement) held at regular times will be sent as announcements on the day of the session. Please look below for summary of topics covered, with textbook references. Fine-print details are below—I encourage you to read through them (it lays out course policies in detail), but I will remind you of anything that is important.

# The Fine Print - Course Policies

Please read on for the full listing of course policy. If you would rather skip it, that is fine; I will remind you of anything that is important.

- **Registration**: After the last day to register for classes (see **academic calendar (https://www.peralta.edu/admissions/academic-calendar-finals-schedule-enrollment-calendar)** ), you must be registered in the class in order for you to receive credit. No students can be added after this date.
- **Attendance**: Please come ready to work at the beginning of every lab class. Instructor may drop a student if the number of unexcused absences exceeds 2 (number of times the class meets in two weeks; refer to pg. 26 of **College of Alameda 2022-2023 catalog (https://alameda.edu/wp-content/uploads/2022/04/CoA-Catalog-22-23_v5_ONLINE-FINAL.pdf)** for the college policy on attendance). Lecture portion is online and no face-to-face attendance is required for the lecture portion of class. If any difficulties in regular attendance arise, please email me so that we can figure out what can be done.
- **Academic Integrity**: Everything you turn in must be your own work. If you use sources other than the textbook, please clearly cite it and give credit where it is due. Allowing another student to copy your own work also constitutes academic dishonesty (there is a fine line between group collaboration and dishonest copying of others' work; I will help you see it, as needed). Please refer to pg. 384-389 of **College of Alameda 2022-2023 catalog (https://alameda.edu/wp-content/uploads/2022/04/CoA-Catalog-22-23_v5_ONLINE-FINAL.pdf)** for the college policy on academic dishonesty and possible disciplinary measures.
- **Honor Code Pledge**: You must complete the honor code pledge (accessible within the first few course Modules) to continue in this class. Students who do not maintain their honor code pledge may become ineligible to participate in certain course activities or be required to complete activities in a format that does not assume honorable conduct of participants.
- **Schedule Subject to Change**: Assignment and assessment schedules are subject to change. Any changes will be announced through Canvas.
- **Late Assignments**: All assignments are due on the date noted. Canvas will accept late submissions on essay or discussion assignments (the instructor reserves right to grade late submissions in appropriate cases). MyOpenMath assignments must be extended using a "late pass". Twenty-four late passes are given at the beginning of semester, and each late pass extends a MyOpenMath assignment deadline by one week (168 hours). Satisfactory progress through the course in a timely manner is required to pass the class.
- **Allowed/Prohibited Items During Timed Assessments (open book)**: Certain assessments are timed and are used similarly as "exams" in face-to-face classes. Following is the description of what you may use and what you may not use during these assessments.
  - Allowed: calculators, foreign language dictionaries, any material that is provided in the context of the course (usually through Canvas), and the means used to access the assessment.

  - Prohibited: any outside help, including but not limited to: (a) any individual other than the instructor providing help during the exam, (b) external websites, unless they are used purely for calculation function, and (c) external references, either in digital or paper-bound format, other than those allowed above.
- **Holistic Grading Rubric**: A holistic grading scale is used for grading essay or freeform-answer questions.
  - 5 (out of 5 points possible): "Excellent understanding." The student clearly understands how to solve the problems; one or two minor mistakes can appear on a “5” solution, if they don’t lead to larger conceptual errors.
  - 4: "Good understanding." The student understands the main concepts and problem-solving techniques but is missing one major concept, or made one major mistake that may involve conceptual misunderstanding.
  - 3: "Fair understanding." The student started to set up the solution and is on the right track of applying the problem-solving techniques but is several major steps (or mistakes) away from being able to solve it.
  - 2: "Poor understanding." The student jots down some formulas from memory or textbook that may be relevant to the problem but shows little conceptual understanding of how they should be used.
  - 1: "No understanding." The student writes down something that has something to do with the problem.
  - 0: "Blank." Blank answers.

  Any requests for consideration of grade change must be submitted in writing.
- **Course Grading Contract**: This course uses **contract grading (https://en.wikipedia.org/wiki/Contract_grading)** . Please review **Physics 4B Grading Contract** and make any exception requests in a timely manner.

# Topics Covered

Following is the 14-week schedule of topics being covered (shortened from the regular 16 weeks). Chapter references are for OpenStax ***University Physics Volume 2*** **(https://openstax.org/details/books/university-physics-volume-2)** , unless otherwise stated.

- **Week 1: Thermodynamics Intro** (Chapters 1 and 2)
- **Week 2: First Law of Thermodynamics** (Chapter 3)
- **Week 3: Heat Engine Cycles and Second Law of Thermodynamics** (Chapters 3 and 4, and additional materials)
- **Week 4: Electric Fields** (Chapter 5)
- **Week 5: Gauss's Law** (Chapter 6)
- **Week 6: Electric Potential and Capacitors** (Chapters 7 and 8)
- **Week 7: Ohm's Law and DC Circuits** (Chapters 9 and 10)
- **Week 8: Magnetism Intro** (Chapter 11)
- **Week 9: Ampere's Law** (Chapter 12)
- **Week 10: Faraday's Law** (Chapter 13)
- **Week 11: Inductors** (Chapter 14)
- **Week 12: Time-Dependent Circuits** (Chapters 10 and 15)
- **Week 13: AC Circuits** (Chapter 15)
- **Week 14: Maxwell's Equations** (Chapter 16)