



Waves and Thermodynamics for Scientists and Engineers

PHYC 4C

Section: 001 CRN: 71501

Full Syllabus Location

This version of the syllabus follows a CCSF-wide template and is not complete (tables and links are particularly clumsy at this point). Follow one of the links below to find the full syllabus:

- [Syllabus \(Canvas page\)](#). This link is appropriate for students enrolled in this course and currently logged into Canvas.
- [Syllabus \(external pdf\)](#). This link is appropriate for external viewers, including prospective students (not yet enrolled) and administrators.

Student Learning Outcomes

1. Apply the fundamental laws of waves and thermodynamics to investigate and assess physical phenomena that impact society.
2. Use mathematics up to and including calculus to solve waves and thermodynamics problems.
3. Communicate physics concepts, processes, and results effectively.

Class Meeting Information

Start and End Dates

August 18, 2025 - December 19, 2025

Important Dates:

Last day to add: September 5, 2025

Last day for refund: August 29, 2025

Last day to drop without W: September 5, 2025

Last day to drop with W: November 13, 2025

Last day to elect pass/no pass: NA

Class Meeting Information

Dates	Days	Times	Location
	08/15-12/19	03:10 pm - 04:00 pm	Science Building 108

Instructor Information

Name: Karl Westerberg

Email: kwesterb@ccsf.edu

Office Number: S187

Office Phone: 415-239-3375

Course Information

Course Description/Overview

This is the third course in a calculus-based four-semester sequence. Core

topics include mechanical, sound and light waves; geometrical and physical optics; and thermodynamics.

Transferability

UC/CSU

Requisites/Advisories

PREREQ: PHYC 4B and MATH 110C RECOMMENDED PREP: Completion of or concurrent enrollment in: PHYC 4CL

Grading Options

Letter

Equity Statement

Students represent a rich diversity of backgrounds and perspectives. I am committed to providing an atmosphere for learning that respects diversity. While working together to build this community, I request that all of us

- share our unique experiences, values and beliefs;
- value each other's opinions and communicate in a respectful manner;
- be open to the views of others;
- honor the uniqueness of others; and
- appreciate the opportunity that we have to learn from each other in this community.

You belong here! Please keep me informed if you find yourself struggling, or if a situation arises (either within the classroom or outside of the classroom) that makes you uncomfortable or otherwise hinders your success in this class. I will respect your wishes concerning confidentiality.

Course Materials

Title: Fundamentals of Physics, Chapters 21-32

ISBN: 9781119801146

Authors: Halliday, Resnick, and Walker

Publisher: John Wiley and Sons Inc

Publication Date: 2021

Edition: 12 (11 or 10 okay)

Grading Policies and Evaluation Methods

Grading categories

Final grades are based on worksheets, online quizzes, and exams in the following proportion:

grade categoriesCategoryPercentage of final grade

Worksheets / discussion	20% (aggregate)
Online quizzes	10% (aggregate)
Midterm exams	40% (2 x 20%)
Final exam	30%

Some things to note:

- Each graded discussion forum is scored out of 8 points and the submitted worksheet is scored out of 12 points, for a total of 20 points for the week. The total worksheet grades for each week are tabulated, the lowest score dropped, and the remaining scores averaged to arrive at the total worksheet/discussion grade. This is worth 20% of the final grade.
- Note that the discussion forum is optional for students who attend the given conference session in person. Therefore, your discussion forum grade will be 8 out of 8 for conferences attended in person, regardless of your participation (or lack thereof) in the discussion forum.
- Online quizzes are graded out of 100 points as the higher of two attempts on that quiz. Each quiz result is tabulated, the lowest score dropped, and the remaining scores are averaged to arrive at the total online quiz grade. This category is worth 10% of the final grade.

- The midterm exams are each graded out of 100 points, and are each worth 20% of the final grade for a total of 40%. The final exam is graded out of 150 points, and is worth 30% of the final grade.
- If the final exam percentage is higher than the lower of the two midterm exam scores, then that lower midterm exam score will be replaced by the final exam percentage. If the final exam percentage is lower than both midterm exam scores, then no such replacement takes place. If you miss a midterm exam for any reason, you will receive a zero on the exam, which will surely be replaced by the final exam percentage. However, if you receive a zero on an exam due to violations of the honor code (i.e., cheating), that zero will not be eligible for replacement by the final exam percentage.

Assignment of letter grades

Final grades will be calculated as an appropriate weighted average of the final scores for each category listed above, resulting in an overall grade percentage for the course. This will be converted to a letter grade according to the following table:

grade rangesLetterRange

A	90% <= overall
B	80% <= overall < 90%
C	65% <= overall < 80%
D	50% <= overall < 65%
F/FW	overall < 50%

Some things to note:

- Many of the individual assignments are graded in terms of "points". It is important to note that points may not be comparable between different grading categories (e.g., 10 points on an exam may be quite different from 10 points on an online quiz). The correct method for calculating your overall percentage is detailed above.
- The table above generally defines a lower bound of your final letter grade. There may be upward adjustments made if overall scores are clustered, and some of the students fall slightly below the boundary for a higher grade. The actual dividing lines between the letter grades are determined at the end of the semester, after all

grades have been tabulated, and without looking at individual student names. Note that this "curve" applies to the overall grade -- individual items are never "curved".

- The difference between an "F" and an "FW" grade is as follows: An "F" grade indicates that a student completed the course, including the final exam, but failed to master the material. An "FW" grade indicates that the student stopped participating in the course after the "last day to withdraw" deadline. Please check with your counselor and financial aid advisor for possible implications of the "FW" grade on residency and financial aid status.

How to view your grades

Visit the "Grades" in Canvas to keep track of your grades.

How do I view my grades, teacher comments, and an assignment rubric as a student?

Note: It is not possible to program the Canvas grade book to calculate your overall percentage correctly, although I can get reasonably close. The main issues revolve around correctly dropping the lowest quiz and the lowest worksheet, and using the final exam score to replace one of the midterm exam scores. In most cases, Canvas will underestimate the final percentage. Do note that individual scores will be correctly reported by Canvas -- it is the aggregate scores that may be wrong. Your final grade for the course will be correctly calculated (according to the rules above) by a program outside of Canvas. I plan to post correctly calculated overall percentages for each student as an extra "graded" item in the grade book. This will be done once at midterm and again at the end of the semester when final grades are calculated.

Accommodations for Students with Disabilities

Students seeking disability-related accommodations are encouraged to register with Disability Services & Programs for Students located on the first floor of the Student Success Building. DSPS can be contacted in person (Student Success Building - First Floor), via phone (415) 452-5481, or via email at dspsacom@ccsf.edu. Please see the [DSPS website](#) for more information about office hours, and alternate locations.

If you already have approved accommodations for classroom or testing because of a disability, be sure to submit your DSPS accommodation document to the instructor as soon as possible. If you have emergency medical information to share or need special

arrangements if the building needs to be evacuated, please make an appointment with the instructor as soon as possible.

Non-Discrimination and Anti-Harassment Policy

The San Francisco Community College District adheres to all applicable federal, state, and local laws and regulations that uphold the principle of equal opportunity and prohibit discrimination and harassment on the basis of race, color, ancestry, national origin, ethnic group identification, religion, age, gender, gender identity, marital status, domestic partner status, sexual orientation, disability, AIDS/HIV status, medical conditions, status as Vietnam-era veteran, or past, current, or potential pregnancy or pregnancy-related conditions such as lactation, or on the basis of these perceived characteristics, or based on association with a person or group with one or more of these actual or perceived characteristics.

These laws and regulations include but are not limited to the California Education Code, the California Code of Regulation Title 5, the Equal Employment Opportunity Act, the Americans with Disabilities Act, the Rehabilitation Act (1973) §504, and Title IX, which defines sexual harassment of students, including acts of sexual violence, as a form of sex-based discrimination. For more information about students' rights to access to the College's programs and activities, or if you believe you have been subject to discrimination or harassment, please contact [CCSF's Title IX Coordinator](#): Email: TitleIX@ccsf.edu

Standards of Conduct

Students who register in CCSF classes must abide by the [CCSF Student Code of Conduct](#). Violation of the code is the basis for referral to the Office of Student Conduct & Discipline and may result in dismissal from class or the College. See the [Office of Student Affairs](#).

Collaborating on or copying of tests or homework in whole or in part will be considered an act of academic dishonesty. See these resources on plagiarism:

[Encourage Academic Integrity and Prevent Plagiarism](#)

[Citing Information Sources](#)

Academic Tutoring

As a City College student, you can access many free services to help you succeed in your classes and navigate college. Please come to the STAR (student tutoring and resource) Center for free Peer and Professional tutoring and mentoring, individual or group study spaces, workshops that center your learning needs, an open-access computer lab with printing, and a welcoming community. Our centers and labs are free and available online and in person. Please join us: we care about your success!

Visit the [STAR Center](#) within the Learning Assistance Department.

Library

[City College of San Francisco's Library](#) offers many services to help you with your classes.

Take online library workshops, learn how to get started on a research project, borrow textbooks and other instructional materials, and much more.

[Borrow Technology from the Library](#) - Chromebooks, laptops, and hotspots can be borrowed from all CCSF Libraries.

Visit City College libraries in person at Rosenberg (at Ocean Campus), the Chinatown/North Beach Center, the Downtown Center, the Evans Center, the John Adams Center, and the Mission Center.

A librarian is on-site and available to help during [open hours](#).

Student Services

Ram Resources

[Ram Resources](#) is a searchable resource hub to help you navigate CCSF programs, services, and resources.

Financial Aid

Unlock Your Financial Aid Potential: FAFSA/CADAA Adventure Awaits! Learn more about [FAFSA](#) and [CADAA](#). We encourage you to apply to maximize all Financial Aid resources! Come visit us in the Financial Aid Office located in SSC Building 112. Email: finaid@ccsf.edu or [Financial Aid Virtual Counter](#).

Counseling

Counselors are here to help you find your way through City College and support you in completing your educational goals. Please make an appointment to see a counselor by visiting [Counseling](#). To view your education plan, please visit [Degree Works](#).

Admissions and Records

The [Office of Admissions and Records/Registration](#) is the beginning and the end, along with everything in between in your journey at CCSF. From getting started to registering each term to completing your degree and accessing your academic records, we provide the services to help ensure a smooth transition in achieving your educational goals. We want to be your partners on this journey. Visit us in SSC 1124.