

# Physics 212

General Physics  
Spring 2021

**Instructor: David Newman**

**Office: 112 REICH**

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## Office Hours:

**Monday 4:00-5:00pm by Zoom** - Link <https://us02web.zoom.us/j/83121991638?pwd=V05oVGtaUUpkMjc3alVERTlIQkNvQT09>

**Wednesday 2:30-3:30pm by Zoom** - Link <https://us02web.zoom.us/j/83121991638?pwd=V05oVGtaUUpkMjc3alVERTlIQkNvQT09>

**Additionally, a help "room" will be staffed to answer homework related questions. This will likely be by zoom.**

## [Semester schedule \(calendar\)](#)

## [Homework](#)

## [Review/Problem Sessions](#)

## [Formula sheet Exam 1 \(PDF\)](#)

## [Web Projects](#)

## [Links to Web info \(to help with your project\)](#)

## [Videos of Class HW/Review sessions](#) (Available on Blackboard under Media Gallery)

## [Extra Videos of Class](#)

## [Link to Auroral Forecast at the GI](#)

**This syllabus is located at: [http://ffden-2.phys.uaf.edu/212\\_spring\\_2021.html](http://ffden-2.phys.uaf.edu/212_spring_2021.html)**

## Course Syllabus

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In approaching this (and all) classes, please note the following ancient Chinese proverb:

*Teachers can open the door,  
but you must enter by yourself.*

**Course Content:** In the first part of the course you will learn basic thermodynamics including the 3 laws of thermodynamics and applications to such diverse problems as temperature, the efficiency of engines and the ultimate fate of the universe. Then the course will explore electricity and magnetism. We will start by discussing electrostatics followed by DC circuits and magnetostatics. Then we will talk about the interactions between electric fields and magnetic fields which will lead to AC circuits. We will then end the semester with an introduction to Electromagnetic waves. Most importantly, you are also very likely to learn to impress your friends with your knowledge of the universe (or bore them to tears), so be prepared for being introduced to "*The Power of Physics*".

**Prerequisites:** Calculus, high school physics and Physics 211. Algebra, trigonometry and calculus will be used extensively.

### Materials Needed:

Required Text: *Physics for Sci & Engrg w/Mod Physics 4th Ed.*, Knight

Calculators: **No calculators may be used during exams or quizzes.** Otherwise, buy yourself a nice one. A basic, simple scientific calculator with trigonometric, exponential, and logarithmic functions is all that you need.

**Lectures: Important note: The first week of class (or two, to be decided) will be online by zoom during both the 9:15-10:15 and 10:30-11:30 class times. The zoom class will also be recorded and posted. The link is: <https://us02web.zoom.us/j/83121991638?pwd=V05oVGtaUUpkMjc3a1VERTlIQkNvQT09>**

(F01) 10:30am MWF in 201 Reich or (F02) 9:15-10:15 MWF in 201 Reich. **You must attend the section you are supposed to attend due to room capacity limits.** *The lectures supplement but do not substitute for the reading.* Lectures will cover the major topics, emphasizing and discussing the important points. They are not sessions to regurgitate material already written in the text. Your personal participation is important, and it is critical that you read the assigned material before lecture. Time permitting, several Friday lectures will cover special topics beyond the scope of the text. These will be announced before hand.

**Homework:** There will be approximately one homework assignment per week. The assignment will be given out online on Wednesdays and will be due in on the following Friday by 11:40AM (right after class). We will use google classroom for submitting homework. You are encouraged to work with others on the homework, but make sure the paper you turn in is not simply copied from someone else. These assignments help me assess your understanding of the material, and will count toward your final grade.

**Late problem sets will not be accepted in general.**

Only a selection of problems will be graded each week, totaling about 25-30 points each.

**Quizzes:** 6 - 12 short quizzes will be given in class during the semester. They will be closed book and no calculators allowed (or needed). All difficult formulas needed will be given and the quiz will be similar to some of the recent homework or topics covered in class. The quizzes will be announced in class and on the schedule page at least one week in advance. I am still working out how to give the quizzes in a paperless manner.

**Project:** There will be a project due worth a maximum of approximately 10% of the course grade. The project will be in the form of a web page on a topic in physics that you find interesting and we agree on together. These topics could include biographies of important scientists, scientific projects and scientific ideas. The topic must be agreed to by Feb 5th and must be completed by **April 14th** They will be graded both for presentation and content. More details will be discussed in class and on the web project link above.

**Labs:** There is a lab associated with this course. **ALL** labs and reports must be completed to get a passing grade for the lab.

**A PASSING GRADE IN THE LAB IS NECESSARY TO PASS THE COURSE.**

Labs may only be made up if excused and with permission of the course instructor. Questions about the lab should be directed to the teaching assistant in charge of your lab or as a last resort me.

**Hour Exams:** Exams will be given during the Friday lecture as follows:

Feb. 19, approx. Chapters 18-21 and 22-23

April 2, approx. Chapters 23-29

The exams will be closed-book, but you will be given one side of an 8 1/2 x 11-inch sheet with most of the needed equations and will be allowed one sheet (double sided) of whatever notes you wish. No calculators are allowed. The exams will be graded and handed back as soon as possible. Solutions will be discussed.

For the exams and quizzes the following honor code will be followed:

Honor code: I promise to do my own work, not use internet sources, the text book or other books, help from friends, family (or enemies for that matter) etc, email or text messages, notes beyond those allowed, or calculators.

**Final Exam:** The final exam will be at ?? a.m. - ?? p.m., ??, ?? ?? . It will cover the entire course (Chapters 18-32), with some emphasis on the more recent material. The final will be closed-book, but you will be given two sides of an 8 1/2 x 11-inch sheet with most of the needed equations and you will be allowed two sheets (double sided) of whatever notes you wish.

**Grading:** The course grade will consist of the following components (though I reserve the right to make grade adjustments based on performance trends):

2 hour exams	30 %
Final exam	25 %
Homework	10 %
Quizzes	10 %
Project	10 %
Lab	15 %

I grade on a curve however to satisfy university requirements, above 95% will be at least an A, above 85% will be at least a B above 75% will be at least a C, above 65% will be at least a D (in most cases the actual curve is significantly lower!).

**Contacting Me:** I have office hours as listed above. You can drop by at other times if I'm not busy, or make an appointment. I am (almost) *never* available before class.

**COVID-19 statement:** Students should keep up-to-date on the university's policies, practices, and mandates related to COVID-19 by regularly checking this website:

<https://sites.google.com/alaska.edu/coronavirus/uaf/uaf-students?authuser=0> Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply.

**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 will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities.

**Plagiarism etc:** Plagiarism and cheating are matters of serious concern for students and academic institutions. This is true in this class as well. The UAF Honor Code (or [Student Code of Conduct](#)) defines academic

standards expected at the University of Alaska Fairbanks which will be followed in this class. (Taken from the [UAF plagiarism web site](#), which has many links with good information about this topic)

**Complaints and Concerns:** You are always welcome to talk to me about anything, however, if you have a non-subject matter question or concern that cannot be resolved by me, contact the department chair, Dr. Truffer, Physics Department Office, room 102 REICH.

**Alternate References:** To see the same topics explained differently, try the following:

*Physics for Scientists and Engineers*, Serway and Jewett.

*Fundamentals of Physics*, 8th edition, Halliday Renick and Walker.

*The Feynman Lectures on Physics*, Richard Feynman ( a great set of books...but rather deep)

Here is a good web site on how to study physics which might be of interest and use: [How to study physics](#)

**General Advice:** Physics is not something you read and memorize, rather it is something you learn how to do. Try the following study procedure:

1. Read the chapter prior to lecture, so that you will know what it's about.
2. Listen carefully to the lecture and take notes.
3. This is crucial: *Do not go back and read and re-read* the chapter until you "understand it." Rather, start working problems, going back through the chapter to clarify points as they come up. I suggest you try to answer all "Checkpoint" problems in the text and the questions at the end of the chapter. If you understand these, you've probably understood the salient points of the chapter.
4. Think! Don't simply try to fit the problems into the form of another problem, think through the problem first.
5. [Interesting Physics computer demos](#)

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Last updated 25 Dec, 2020