Physics 212
General Physics
Spring 2017

Instructor: David Newman
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Office Hours:

Monday 4:00-5:00pm in 112 REICH

Wednesday 2:30-3:30pm in 112 REICH

Additionally, a help room will be staffed to answer homework related questions. This will be in the Physics conference room (122REICH) and will be staffed at various times each day (the schedule is posted on the Rm122 door).

Semester schedule (calendar)

Homework

Review/Problem Sessions

Formula sheets (Final Exam formula sheet now posted)

Web Projects

Links to Web info (to help with your project)

Videos of Class HW/Review sessions (exam review and homework help sessions when possible)

Link to Auroral Forecast at the GI

This syllabus is located at: http://ffden-2.phys.uaf.edu/212_spring_2017.html

Course Syllabus

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 3rd 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: 10:30am MWF in 201 REICH. 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 (and posted on the web) on Wednesdays and will be due in on the following Friday by 11:35AM. Place your homework in the appropriate box in the Physics Department Office. 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.
Only a selection of problems will be graded each week, totaling about 25-40 points each.

Quizzes: ~10 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.

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 13th and must be competed by April 24th. 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. 24, approx. Chapters 16-19 and 25-27
April 7, approx. Chapters 27-32

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. No calculators are allowed. The exams will be graded and handed back as soon as possible. Solutions will be discussed.

**Final Exam:** The final exam will be at 10:15 a.m. - 12:15 p.m., Weds, May 3. It will cover the entire course (Chapters 16-19 and 25-35), 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.

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

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tr>
<td>2 hour exams</td>
<td>30%</td>
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<tr>
<td>Final exam</td>
<td>25%</td>
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<tr>
<td>Homework</td>
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<td>Quizzes</td>
<td>10%</td>
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<tr>
<td>Project</td>
<td>10%</td>
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<tr>
<td>Lab</td>
<td>15%</td>
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I grade on a curve however to satisfy university requirments, 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.

**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. Wackerbauer, 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.


*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](http://ffiden-2.phys.uaf.edu/212_spring_2017.html)

**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**

Last updated 25 April, 2017