Physics 211

General Physics
Fall 2016

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 (122NSF) and will be staffed at various times each day (the schedule is posted on the Rm122 door).

This syllabus is located at: http://ffden-2.phys.uaf.edu/211_fall_2016.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 the basic language of physics including measurement and how we discuss and quantify motion. We will then move on to calculating the motion of bodies

which will lead us into the wonders of Newton's 3 laws of motion. You will learn to love them (or at least learn them) and their applications to such a wide range of problems such as fair rides, space ships, skidding cars and even hanging signs. Then the course will explore energy and momentum, two of the most important and powerful concepts in the physics of motion. This will be followed by an introduction into Gravitation followed by fluid mechanics. This will then lead into a discussion of waves including sound wave and such cool things as noise canceling headphones. Most importantly, you will learn to impress your friends and relatives with your knowledge of the universe (or bore them to tears), so be prepared for being introduced to "*The Power of Physics*" (said with reverb!).

Prerequisites: Calculus and high school physics. 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 and in the hall in front of my office) on Wednesdays and will be due in on the following Friday by 11:40AM (right after class). 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 25-30 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.

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 Oct 5th and must be competed by Nov 23rd. 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(or monday) lecture as follows:

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Oct. 7, approx. Chapters 1-6
Nov 11, approx. Chapters 6-12
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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., Mon, Dec. 12**. It will cover the entire course (Chapters 1-15, 20-21), 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):

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

Note: I reserve the right to make adjustments to the final grade based on trends in your grades over the semester

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 significently 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 NSCI.

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

Physics for Scientists and Engineers, Serway and Jewett.

Fundementals 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**

Last updated **10 December, 2016**