Syllabus for General Physics II, PHYS 212X

Fall 2018

Lecture
MWF 5:50-6:50 PM, REIC 201

Laboratory
REIC 257
FE1, 74108, W 2:15-5:15 PM
FE2, 74109, W 7:00-10:00 PM
FE3, 74110, R 2:15-5:15 PM

Instructor: Ataur R. Chowdhury

Office: REIC 118

Office Hours: MWF 10:30-12:00 AM

Contact: Phone (907) 474-6109
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Teaching Assistants: TBA
Lab Instructor: Beth Roberts earoberts8@alaska.edu, 474-7857

Prerequisites: Concurrent enrollment in MATH 202X; PHYS F211X or ES 208 or concurrent enrollment in ES 210; placement in ENGL F111X or higher; or permission of instructor.

Texts: Physics for Scientists and Engineers: A Strategic Approach, Randall D. Knight, 3rd Edition, Pearson.

Course Objectives: To acquire a basic understanding of (i) the fundamentals of heat and thermodynamics; (ii) the concepts of electricity and magnetism; and (iii) Maxwell's equations and electromagnetic waves.

Course Outline: **Heat**, **temperature**, **laws of thermodynamics**, **Coulomb's Law**, **Gauss's Law**, electrical potential, **electrical energy**, capacitance, Kirchhoff's Laws, Biot-Savart Law, **Faraday's Law**, **Maxwell's equations**, and electromagnetic waves.
The **highlighted** topics will form the major focus of this course, and the students will be assessed for the mastery of these concepts through homework, quizzes, labs, and tests.

Credits: 4 credits: 3 hr. of lecture, and 3hr. of lab per week.

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Help Session: Help with homework and lab is available through the teaching assistants (TAs) during the hours posted on the door of REIC 122.

MTWR: TBA (REIC 122)

Additional help with homework is available through the instructor during his designated office hours.

Course Requirements/ Policies:

Class Attendance:
For a better understanding of the course material attendance and participation in classroom activities are very important. This particular course is generally regarded as one of the basic courses that deal with the fundamentals of classical physics, and it is highly expected that the students will commit themselves to attend the class regularly. There will be supplemental materials for this course and the students will be held responsible for all the materials that will be brought in from outside the text. The students will be expected to take part in meaningful discussion and ask questions to better comprehend the subject material. It is highly expected that the students will cause least disruption of class activities by showing up before the class starts, not leaving the class before it stops, keeping cell phones in silent mode, and refraining from talking during the class.

Homework:
On the average, 8-12 problems/exercises/questions will be assigned each week on Fridays. The homework will be due back by 4:30 PM on Fridays the following week. There is a designated drop-box for PHYS 212X homework inside Physics office (REIC 102). NO LATE HOMEWORK WILL BE ACCEPTED. NO EXCEPTIONS (barring emergencies and extreme situations). Group work is highly encouraged for solving problems, and for additional help with the homework the students are most welcome to consult the instructor during the office hour or any other time by prior appointment. Any homework you submit should reflect you own best effort. Copying of homework is absolutely not acceptable and will result in a grade of zero for the assignment.

Quizzes: There will be one quiz every week of the semester on Fridays, except the first week and the week of the midterm. These quizzes will be administered during the last 15-20 minutes of the class and are designed to test students understanding of the subject material covered during the preceding week. The quiz may include problems similar to the homework, those worked out in class, and may also include 'intuitive' question pertaining to the subject material covered during the previous week.

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Examinations:
There will be a midterm examination (October 15, Monday, 5:50-6:50 PM) and a final comprehensive examination (December 12, Wednesday, 5:45-7:45 PM) for this course. Examinations will consist of, in most part, material similar to those in the homework, quizzes, and those covered in class. Midterm will cover the material covered in class and homework prior to the date of test, and the final will be comprehensive and will include all material covered in the semester, with more weight on material covered after the midterm.

Laboratory:
The laboratory is an integral part of this course, and each student must register for and attend the lab section and perform all labs. All labs and reports must be completed or you will fail this course (lecture and lab). Every effort must be made to makeup a lab during the same week if possible. You must coordinate this option with the Lab Supervisor. General makeup lab times are scheduled near the end of the semester; the dates are as specified on Blackboard. Lab reports must be turned in on time. Any lab turned in late will get deducted 10% for each day after the date it is due; refer to the lab policy stated in your lab manual. A PASSING GRADE IN THE LAB IS REQUIRED TO PASS THE COURSE. For additional details regarding lab, please consult the lab policy provided in your lab manual.

Grading Policy:

Homework	15%
Lab	15%
Midterm	15%
Quizzes	30%
Final	25%
Total	100%

The final grading for this course will be based on a curve. The curve is based on the weighted scores, according to the grading policy, after the final. Allowed grades are limited to A, B, C, D, F, IN, NB, and no plus-minus grades will be given for this course.

Academic Honesty

UAF expects and requires academic honesty from all members of the University community and takes any act of plagiarism and cheating seriously. It is expected that all assignments, including homework and reports, that are turned in for this course must the original work of the individual student. Failure to comply with this policy will result in penalty as stipulated under UAF regulations.

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Disabilities Services

The UAF Office of Disability Services implements the Americas with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. Any student who may need assistance with disabilities, should feel free to contact the instructor or directly to the Office of Disabilities Services (204 WHIT, 474-5655, uaf-disabilityservices@uaf.edu).

General Remarks

"Physics is just the refinement of everyday thinking," A. Einstein

Physics is the subject that requires you to think and ponder. Physics is not mathematics, but it does require mathematics to make it useful. In order for you to succeed in this course you may pay heed to the following suggestions.

1. Read the chapter before it is discussed in class so that you know the material and know what questions to ask for clarification.
2. Start your homework on day one so that you have ample time to think about the questions and get the help you need.
3. Think the problems through and follow the logical sequence to get the result.
4. Do not hesitate to ask for help. We wish all of you to excel and we are here to help.

Tentative Schedule

Lecture, Reading, Quiz and Exam

Dates	Topics	Reading Assignment
Aug. 27	syllabus, scope	
29	temperature	Ch 16: sections 1-3
31	heat and energy	Ch. 16: sections 4-6
3	**Labor Day (no classes)**	
5	ideal gases	Ch 17: sections 1-4
7	first law, calorimetry	Ch 17: sections 5-8
	Quiz#1	

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10	pressure, temperature	Ch 18: sections 1-3
12	thermal interaction	Ch 18: sections 4-6
14	second law of thermodynamics	Ch. 19: sections 1-2
	Quiz#2	
17	heat engine	Ch 19: sections 3-4
19	carnot engine	Ch 19: sections 5-6
21	electric charge	Ch 25: sections 1-3
	Quiz#3	
24	Coulomb's law	Ch 25: sections 4-5
26	electric field	Ch 26: sections 1-2
28	electric field calculation	Ch 26: sections 3-5
	Quiz#4	
Oct. 1	charges in electric field	Ch 26: sections 6-7
3	electric flux, Gauss's law	Ch 27: sections 1-3
5	applications of Gauss's law	Ch 27: sections 4-6
	Quiz#5	
8	potential and potential energy	Ch 28: sections 1-3
10	potential of charge distributions	Ch 28: sections 4-5
12	potential energy	Ch 28: sections 6-7
	Quiz#6	
15	**Midterm**	**Ch (16-19, 25-28)**
17	electric field and potential	Ch 29: sections 1-4
19	capacitors, electrical energy	Ch 29: sections 5-6
22	dielectrics	Ch 29: sections 6-7
24	current and resistance	Ch 30: sections 1-3
26	Ohm's law	Ch 30: sections 4-5
	Quiz#7	
29	electric circuits, Kirchhoff's rules	Ch 31: sections 1-2
31	basic dc circuits	Ch 31: sections 3-4
Nov. 2	basic circuits, power	Ch 31: sections 5-7
	Quiz#8	
5	electric power	Ch 31: sections 8-9
7	magnetism, magnetic field	Ch 32: sections 1-3

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9	Ampere's law **Quiz#9**	Ch 32: sections 4-6
12	electric force and torque	Ch 32: sections 7-10
14	em induction	Ch 33: sections1-2
16	Lenz's law **Quiz#10**	Ch 33: sections 3-4
19	Faraday's law	Ch 33: sections 5-7
21	**Thanksgiving Break (no classes)**	
23	**Thanksgiving Break (no classes)**	
26	induced current, inductors	Ch 33: sections 8-10
28	Maxwell's equations	Ch 34: sections 4-5
30	properties of em waves **Quiz#11**	Ch 34: sections 6-7
Dec. 3	em waves	Ch 34: sections 1-3
5	AC circuits	Ch 35: sections1-3
7	RC, RLC circuits **Quiz#12**	Ch35: sections 4-6

Dec. 12 **Final Examination** (chapters 16-19, 25-35), Wednesday, 5:45-7:45, REIC 201

Laboratory Schedule
REIC 257

Weekly schedule of the lab will be posted on the blackboard.