
Syllabus — Introduction to Physics II

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Texts: *Physics for Scientists and Engineers*, Vol 2
by Randall Knight, 4th ed.
Homework: Mastering Physics, online system
course code: MPKINTNER2019SPRING
Lecture: MThF 11:45-12:50
Course page: <http://physics.stmarys-ca.edu/>

Course Description: This course is intended as an introduction to physics for students who are considering a major in physics, mathematics, pre-engineering, or chemistry. Electricity, magnetism, simple circuits, optics (geometrical and wave), and thermodynamics if time permits, are the topics which will be covered. Prerequisites for the course are: successful completion of Physics 1, 2, Math 27 (or 13+14), and concurrent enrollment in Math 38.

The format of the class will be a combination of lecture, problem solving, and question-and-answer. I expect many days to go something like: 10-15 minutes of lecture or question-and-answer, then a few minutes of student work, which may be working in small groups at your desks or at the board, or working on your own with your book and notes. Then repeat that pattern till we run out of time. There will also be days where we spend the entire hour solving problems. Sometimes they will be guided tutorials and sometimes just to get more problem solving practice. My goal is to have some in-class work to evaluate each day in addition to your homework.

Course Goals: The most obvious goal is for you to learn the material mentioned above. Perhaps not so obvious, but equally important, are: to learn to think physically about the world, and to develop the skills which will allow you to tackle totally new problems.

Laboratory: The lab will complement the lecture. In the laboratory, you will gain hands-on experience with the concepts learned in the lecture. Questions on exams and quizzes during class may be taken from the lab.

You must be concurrently enrolled in a section of Physics 4 (the lab).

Homework: After every lecture, new problems will appear in the online homework system, Mastering Physics. (I like to add them after each course meeting so that they match exactly what we covered in class that day.) You should try them before the next class meeting. Those problems will be due once each week, probably on the following Friday. If it seems like people aren't attempting the homework in a timely manner, I may force the due date to be two days after the assignment, or some such thing.

The online homework system will give you instant feedback about whether you did the problem correctly, so you will know as you go whether you really understand the material. This was my primary motivation for choosing to use an online homework system.

I may also collect some written homework and grade it.

In class work: Plan to do some work in class every day. There is quite a bit of research showing that using a class hour for pure lecture is about the worst use of the hour in terms of student learning! I want you to be active participants in class. Research shows that is the best way to learn. Imagine if you were taking a class to learn to play volleyball—it would be insane to not play volleyball! It turns out it's pretty similar to learning physics—it would be insane not to do Physics!

I will work very hard to make evaluation of in-class work to be about effort and participation and not about getting the answer right. (There is a time for that—on exams, for example. Or someday when you design a bridge. Or discovery a new theory.) But in class, as we grapple with learning new material, that is not the time to always get it right. That's the time to experiment, to play with concepts, to figure things out. To learn how to figure things out.

Exams: There will be three, one-hour exams given on the following dates:

Friday, March 1

Friday, March 29

Friday, May 3

Final Exam: Tuesday, May 21, 10:30am-12:30pm. The final exam will be two hours long and it will be cumulative.

Attendance: Although attendance will not be taken each day, it is strongly recommended that you attend lecture. Of course I think the material we cover in class is important, but there may also be some work in class that I evaluate. Each student is responsible for any assignments or information given during lecture.

In general, in class work and exams cannot be made up. I will drop several in class work scores, and there's a way to replace one exam score (see the section on grading.) My advice: Save these! If you skip the first exam and are sick for the second, or miss too much class, you are in trouble.

Grading:

The weighting for the course grade will be what is shown here:

Homework and In Class Work	30%
Exam I	15%
Exam II	15%
Exam III	15%
Final Exam	25%

Final takes all: Well, almost half anyway. You can replace **one** low (or nonexistent) exam score with the score you receive on the final. This means your final exam score could account for 40% of your course grade. I will only do this if it helps your overall grade. You can't use this clause in reverse. Your final exam score sticks.

College Policies: We all (you and I) agree to abide by all College policies, including, but not limited to the Academic Honor Code and

Student Disability Services

Student Disability Services extends reasonable and appropriate accommodations that take into account the context of the course and its essential elements, for individuals with qualifying disabilities. Students with disabilities are encouraged to contact the Student Disability Services Director at (925) 631-4164 to set up a confidential appointment to discuss accommodation guidelines and available services. Additional information regarding the services available may be found at the following address on the Saint Marys website: <http://www.stmarys-ca.edu/academics/academic-advising-and-achievement/student-disability-services.html>

Approximate Schedule:

Week	Dates	Chapters	Topics	Lab
1	2/11-2/15	22	Charge, Coulomb's Law	Electrostatics
2	2/18-2/22	23	Electric fields	E simulation
3	2/25-3/1	24	Gauss's Law	Oscilloscope lab
	1-Mar		Exam 1	
4	3/4-3/8	25	Electric Potential	E and V mapping
5	3/11-3/15	26	More V and Capacitance	Capacitance
6	3/18-3/22	27	Current and resistance	Ohm's Law/resistance
7	3/25-3/29	28	DC Circuits	Circuit lab
	29-Mar		Exam 2	
8	4/1-4/5	29	Magnetism and Ampere's Law	Force on wire
9	4/8-4/12	30	Faraday's Law	Faraday's Law
10	4/15-4/19	Spring	Break	
11	4/23-4/26	31-32	Electromagnetic fields and waves, AC Circuits	AC Circuit lab
12	4/29-5/3	33	Wave Optics	Diffraction/Double slit
	3-May		Exam 3	
13	5/6-5/10	34	Ray Optics	Lenses
14	5/13-5/17	35	Optical Instruments	Telescopes/microscopes
15	21-May		Final Exam	
	10:30am-12:30pm			