

**Instructor:** Dr. Seth Rittenhouse

Office: CH291

Phone: (410) 293 - 6672

Email: rittenho@usna.edu

**course website:** [www.usna.edu/Users/physics/rittenhouse/SP212.Spring2022.php](http://www.usna.edu/Users/physics/rittenhouse/SP212.Spring2022.php)

**Sections:**

SP211P/3321B: MWF3 (0955 - 1045) CH239, Lab: T34 (0955 - 1145) TBD

SP211P/3321G: MWF3 (0955 - 1045) CH240, Lab: T34 (0955 - 1145) TBD

**Text:** *Physics for Scientists and Engineers* 4/E by Randall Knight (etext).

**Course Overview:** This is the second course in a two-course core sequence covering introductory, calculus-based physics. You will learn concept and problem solving skills covering electricity and magnetism, circuits, light and optics.

**Learning Outcomes:** Being able to “do” physics is much more than finding the right equation and plugging in the right numbers. Instead it involves a whole host of skills such as critical and creative thinking, visualization, inductive reasoning, and being able to translate between different representations of information. In this course you will develop powerful, concept-driven methods and approaches for solving problems and for thinking about the world. The Learning Outcomes for this course are:

1. Know General Physics II concepts and use them qualitatively to draw general conclusions about physical situations.
2. Apply General Physics II concepts to solve technical problems quantitatively using both symbolic variables and numeric values.
3. Use vector mathematics reliably as a natural part of your approach to physics.
4. Use mathematics from your Calculus I, II, III sequence reliably as a natural part of your approach to physics.

**Grading** (6w and 12w shown in parentheses)

Homework: 15%(20%) Labs: 5% Exams: 50%(75%) Final: 30%

**Assessment:** Your grade for the course will be evaluated using the following scale:

Grade	A	B	C	D	F
	90–100%	80–90%	70–80%	60–70%	<60%

If a midshipman earns an F on the final exam, Prof. Rittenhouse reserves the right to give that student a grade that is lower than that midshipman’s 16 week course average.

**Homework:** There will be a homework assignment on the material covered in each lecture from class and will be assigned through the Mastering Physics online system (found at [www.pearson.com/mastering](http://www.pearson.com/mastering) CourseID rittenhouse17900). MasteringPhysics can be a bit buggy using the Chrome browser. I suggest using Microsoft Edge. If you have a Mac, I suggest using Safari. Homework will be due at the beginning of class **2 lectures** after the relevant topic has been introduced assignment was given. Late homework can be turned in for up to 50% credit until the last day of class. I *strongly* encourage you to start working on the homework problems as soon as they are posted. We learn by doing, and you will be at a severe disadvantage if you neglect this aspect of your learning experience. I also encourage you to work with your classmates on these assignments, however in the end your work must be your own. This means that you can discuss assignments, and even work problems out together, but the final product must be yours. **YOU MAY NOT COPY SOLUTIONS** from your classmates or **ANY OTHER SOURCE**. This means that online homework “assistance” is not allowed for this course.

**Labs:** Observation is a key part of physics, and it is important for you to see the things we talk about in the lab. As in all sciences, physics is beholden to the natural world, and everything we will talk about has been confirmed by careful experimentation, and the laboratory aspect of this course reflects the importance of these ideas. The labs are designed to provide experiential learning. You will develop an intuition for the concepts and principles that are discussed in class, and will be introduced to the methodology of experimental physical science. In lab, you will be asked to perform experiment(s), take data, and complete lab worksheets. You will take careful notes taking data and writing observations and answers to questions in clear and complete sentences. Before you leave lab, I will ask to see your lab work, and I will ask you a couple of questions about what you learned in lab. I will base your grade on your notebook and these discussions.

**Exams:** There will be **five** equally weighted, mid-term exams, collectively worth 50% of your grade. All exams are cumulative meaning that you can expect that each exam will contain 33%–50% material covered on previous exams with the remainder focused on new material. Missed exams due to illness or a pre-approved absence will be handled on a case by case basis. After the in-class portion of the exam, you will have the opportunity to receive up to 1/3 credit on incorrect answers for exam corrections which will be due on a day announced in class. Your corrections must be neat, detailed, and complete with *all work* shown to be awarded these points. Exam corrections are an individual exercise and are part of the exam. With that in mind, you may not work on these with others. You also cannot use any external resources to answer these questions. This means you are allowed to reference your book and your notes. You may also schedule EI to discuss exam corrections with me. After checking with me, you may work with an appropriate tutor from the AcCenter as long as you inform them that these are exam corrections, and must be your own work.

**Final Exam:** The final exam is worth 30% of your grade. It is a cumulative 50 question multiple choice collective exam taken by all sections of SP212.

**Extra Instruction:** Please contact me by email to schedule EI. I am here to help you, and I enjoy talking about physics with students so please feel free to contact me about EI. I do ask that you preschedule EI with an email confirmation. This is to ensure that I have you on my calendar, and don't accidentally double book. If you see me in the hall, or stop by my office, I will try to make the time to chat (though I cannot guarantee anything outside of pre-scheduled EI times).

**Classroom behavior:** I expect you to act in a mature and respectful manner in the classroom. Cell phones and laptops are not allowed during class time without special dispensation from Prof. Rittenhouse. There is no food allowed in the room, however you may have a reasonable, covered beverage.

**We must treat everyone with dignity and respect.** Diversity at USNA is fundamental to building and maintaining a strong community, and is one of the armed forces greatest assets. Diversity can refer to multiple ways in which we identify ourselves, including but not limited to race, color, national origin, language, sex, socioeconomic status, age, sexual orientation, gender identity, religion, or ancestry. Each of these identities, along with many others not mentioned, shape the perspectives your fellow midshipmen, the faculty, and the staff bring to the Yard. It is the union of these perspectives that create a stronger and more effective force.

**Each of us is responsible for creating a safe environment for everyone on the Yard.** It is my intent to present the materials and activities of this course in a way that is respectful of our diversity. All members of this class are expected to contribute to a respectful and inclusive environment for every other member of the class. This does not mean we cannot disagree or have different ideas. It does mean we try to consider perspectives other than our own, though they may differ from our own beliefs and experiences.

**Academic Dishonesty and Plagiarism:** Unless told otherwise, all exams will be closed book and collaboration is not allowed. I strongly encourage you to study and work on homework together in groups (your classmates are some of your best learning resources!). However, anything you turn in for credit like homework or exams, must in the end be YOUR OWN WORK. Representing someone else’s work or answers (from any source) as your own constitutes plagiarism, is a violation of the honor concept, and will not be tolerated. Online homework “tutors” (Chegg, Slader, Course Hero, etc.) are not allowed for this course.

**Schedule:** Below is a tentative schedule listing the book sections that I plan on covering each day as well as lab and exam days. I will try to stick to this schedule to the best of my ability. Inevitably, you or I will decide that we need more (or less) time covering a particular topic. This schedule is therefore meant only as a rough guide to what we will be covering on a particular day. Exam days are however immutable and will not be changed.

	Monday	Tuesday	Wednesday	Friday
9Jan – 13Jan		22.(1-3)	22.4	22.5, 23.(1,2)
16Jan – 20Jan	<b>MLK</b>	23.3	23.(3-5)	23.(6,7)
23Jan – 27Jan	24.(1-4)	Lab 1	24.(5,6)	<b>Ex. 1</b>
30Jan – 03Feb	25.(1-3)	25.(4-6)	25.7	26.(1-4)
06Feb – 10Feb	26.5	26.(6,7) & L2	27.(1-3)	27.(4,5)
13Feb – 17Feb	28.(1-3)	<b>Ex. 2</b>	28.(4-6)	Demo Day
20Feb – 24Feb	<b>Pres.</b>	28.(7,8) & L3	28.9	29.(1-3)
27Feb – 03Mar	29.(4,5)	Lab 4	29.6	29.7
06Mar – 10Mar	29.7(redux)	Lab 5	29.(8,9)	<b>Ex. 3</b>
13Mar – 17Mar	<b>S.B.</b>	<b>S.B.</b>	<b>S.B.</b>	<b>S.B.</b>
20Mar – 24Mar	30.(1-3)	Lab 6	30.(4,5)	TBD
27Mar – 31Mar	30.6	Lab 7	30.8	30.9
03Apr – 07Apr	30.10	<b>Ex. 4</b>	31.(2-4)	Demo Day
10Apr – 14Apr	31.5	31.(6,7)	33.(1-3)	TBD
17Apr – 21Apr	33.4	Lab 8	34.(1-3)	34.(4-6)
24Apr – 28Apr	34.7	Lab 9	TBD	Demo Day
01May – 05May	TBD	<b>Ex. 5</b>	TBD	

**Course Policy Changes:** This Course Policy Statement is subject to change. Changes, if any, will be announced in class. Students will be held responsible for all changes.