

**Instructor:**

Name: Dr. Tom Kirkman Phone: 363-3811  
 email: [tkirkman@csbsju.edu](mailto:tkirkman@csbsju.edu) Office: PEngel 132/6  
 Office Hours: 7:30 A.M. – 5:30 P.M. (typically)

132/6) or the nearby labs. Drop in or Zoom in any time!

**Required Texts:**

- *College Physics* (2017) by Open Stax  
 Chapters: 17–32  
 Homework: <http://www.webassign.net>
- *Laboratory Manual for Life Science Physics II*
- <http://www.physics.csbsju.edu/106/>

**Topics:**

Catalog: An introduction to electricity and magnetism, wave phenomena, atomic and nuclear physics emphasizing applications to biological systems. Topics include electric and magnetic forces and fields, direct and alternating current circuits, light, sound, optical instruments, relativity, quantum physics, atomic spectra, nuclear physics, radioactivity. Intended for non-majors. Prerequisite: 105.

Note: we will largely skip relativity this block-scheduled year.

**Grading:**

Your grade will be determined by averaging seven scores: homework score, total lab score, midterm score, total quiz score and the final exam score (the last two are double-counted). Homework should be completed (using **WebAssign**) by midnight on the following class day. Late homework is assessed a 15% penalty; request online an automatic “extension” to submit late homework. The quizzes are daily, 10-minute, in-class exams on just completed material. Missed quizzes cannot be made up. The exams include both multiple choice and numerical problems. You may use the Course Guide to assist you during quizzes and exams. If informed in advance, I may be able to accommodate quiz/exam conflicts. The final exam will be comprehensive and is scheduled for the final 3 hour class period.

If you intend to take this course S/U, please provide me with a signed, unconditional notification *before* the start of the final.

This course completes the survey of physics started in PHYS 105. The topics covered are those selected by Association of American Medical Colleges as important in the life sciences. We will frequently make use of the concepts developed in PHYS 105, particularly the ideas of force, work, and energy.

Unlike many other sciences, physics is grounded in *mathematical* explanations of nature’s behavior. Thus it is often possible to summarize a chapter of physics with a list of equations. While the AAMC says it expects you to be able to apply such equations in multi-step problems, you should understand that physicists do not think of nature as a collection of equations. Rather physicists think of nature in sentences and pictures that interrelate precise concepts. And the best physicists are those that can discover new *fruitful* concepts or new interrelationships between existing concepts. Thus while the famous dead physicist Boltzmann had the equation  $S = k \ln W$  carved on his tombstone, it was not the equation that counted, rather the idea of the interrelationship between entropy and probability. You too may benefit by organizing your understanding of nature in terms of the relationship between concepts rather than just memorizing equations as a sequence of symbols.

**Questions:**

There is no such thing as a dumb question. Questions asked during lecture do not “interrupt” the lecture, rather they are welcomed. I’d much rather clear up a misunderstanding or further develop a topic of interest than continue a dull lecture.

Remember: you are almost never alone in your interests, your misunderstandings, or your problems. You help your classmates by asking questions! If you don’t want to ask your question during class, that’s fine too: I can be found almost any time in my office (PEngel

One final point: it is important to remember that the subject of our study is not the book; it is nature. This course will serve you best if you try to apply what you are learning to the world. For example, the wonderful protein-based machines that animate life are just very complex problems in electromagnetism and quantum mechanics, the two main topic of this course. Think about how electricity generates the structures and motions required to make these machines work.

## Links to Institutional Policies:

- Course Attendance policy  
[www.csbsju.edu/academics/catalog/academic-policies-and-regulations/courses/class-attendance](http://www.csbsju.edu/academics/catalog/academic-policies-and-regulations/courses/class-attendance)
- Statement on accommodations for students with disabilities  
[www.csbsju.edu/student-accessibility-services/information-for-faculty/syllabus-statement](http://www.csbsju.edu/student-accessibility-services/information-for-faculty/syllabus-statement)
- Academic Misconduct and Plagiarism  
[www.csbsju.edu/academics/catalog/academic-policies-and-regulations/rights/academic-misconduct](http://www.csbsju.edu/academics/catalog/academic-policies-and-regulations/rights/academic-misconduct)
- Sexual Misconduct  
[www.csbsju.edu/human-rights/sexual-misconduct/sexual-misconduct-policy](http://www.csbsju.edu/human-rights/sexual-misconduct/sexual-misconduct-policy)
- Title IX policy  
[www.csbsju.edu/joint-student-development/title-ix](http://www.csbsju.edu/joint-student-development/title-ix)