

## PHYS 230 Syllabus Fall 2016

General Physics with Calculus II Electricity & Magnetism

Instructor William Caudy [wcaudy@sfsu.edu](mailto:wcaudy@sfsu.edu)

Office TH 328. See <http://physics.sfsu.edu/~wcaudy/> for office hours.

Section 01: Lecture MWF 2:10-3:00PM in HSS 130; Final Mon Dec 19 1:30-4:00PM in HSS 130.

Links to lecture notes will be posted to iLearn and

PHYS 230 **Course Website:** <http://physics.sfsu.edu/~wcaudy/phys230fall2016.htm>.

MATH 227 and PHYS 220 are **Prerequisites** for PHYS 230. Students who have not completed equivalent courses with a grade of C or higher in each will be dropped from PHYS 230.

Students will be held accountable for all the physics concepts and basic equations from PHYS 220 as well as literally all math classes leading up to MATH 227 including high school math.

**Lab PHYS 232** is a separate 1 unit class taught by a different instructor who assigns you a separate grade. Your work for lab does not affect your grade in lecture, and vice versa, but enrollment in both is required (with possible exceptions for transfer credits and returning 230 students.) You cannot enroll in lab until you are enrolled in lecture. Students not enrolled in lecture will be dropped from all lab sections during the first week of class to make space for those enrolled in lecture.

There are *four* 45 minutes long **Exams** worth 20 points each. Exams are 45 min long with 10 multiple choice questions (2 point each) and 2 written response questions (5 points each). Each written response question will require you to draw a diagram or graph (2pts) and derive an algebraic equation (3pts). Treat the Homework as your Practice Exams. Exams are open notes, but no print offs.

**Textbook:** Physics for Scientists and Engineers - 9e, Serway and Jewett, Cengage Learning, available in the SFSU bookstore. Older editions may be available online and are equally acceptable.

**Homework** is submitted through [webassign.net](http://webassign.net). If you wish to take advantage of HW, purchase a WebAssign account through their website and use the Class Keys below to enroll in your section.

Section 01: *sfsu 5304 4171* Class Keys are 12 characters long, the first 4 characters are "sfsu". An electronic copy of Serway is included with your purchase at the SFSU bookstore. You must be connected to WiFi to use the eBook. *Work with your classmates to solve homework questions!* Attempt homework questions on your own referring to your book and notes, then work with a group and come to office hours. You are free to attend the help sessions of all lab instructors, not just your own.

**Grades** are posted to the course website by the last four digits of your SFSU ID#. Our grade scale is:

letter	F	D	C-	C	C+	B-	B	B+	A-	A
%	0-50	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-100

If your average homework score is greater than your average exam score, then homework is worth 4% and each exam is worth 24% of your total grade. If your average homework score is less than your average exam score, then each exam is worth 25% of your total grade and homework is not counted.

**Course Objectives:**

1. Understand the connections between Coulomb's Law and the law of universal gravitation, and be able to calculate the paths of charged particles in electric and magnetic fields.
2. Know that electric charges and time-varying magnetic fields are the sources of electric fields and be able to calculate electric fields for spherically, cylindrically, and planar symmetric charge distributions.
3. Know that currents, moving charges, and time-varying electric fields are the sources of magnetic fields and be able to calculate magnetic fields for cylindrically and planar symmetric current distributions.
4. Apply Maxwell's equations in their integral form and general vector calculus techniques using Cartesian, cylindrical, and spherical coordinate systems.
5. Know that electric and magnetic fields store energy and be able to calculate this energy for symmetric fields.
6. Analyze AC and DC circuits constructed from batteries, resistors, capacitors and inductors, and be able to calculate the current through and voltage across all components as a function of time.
7. Know that, in classical electromagnetism, light is an electromagnetic wave emitted by accelerated charges which transports energy and momentum.
8. Understand historical and conceptual connections between classical and modern physics.

**Student Learning Outcomes for Lower Division Physical Science (B1):**

1. Explain the steps in the scientific method of inquiry, which involves gathering observable, empirical and measurable evidence subject to specific principles of reasoning, and recognizing that reproducible observation of a result is necessary for a theory to be accepted as valid by the scientific community;
2. Analyze specific examples of how the scientific method has been used in the past to collect data through observation and experimentation, and to formulate, test and reformulate hypotheses about the physical universe; evaluate scientific information from a variety of sources and use that information to articulate well-reasoned responses to scientific concerns;
3. Evaluate scientific information from a variety of sources and use that information to articulate well-reasoned responses to scientific concerns;
4. Recognize the utility of alternative scientific hypotheses in the development of scientific theories, research and applications and understand how scientific evidence is used to develop hypotheses and theories;
5. Describe ethical dilemmas arising out of contemporary scientific research and applications, which may include those related to social justice, and may have implications for local and/or global communities;
6. Use scientific theories to explain phenomena observed in laboratory or field settings; and
7. Discuss the relevance of major scientific theories and research to their lives.

***Withdrawals are only permitted in emergency circumstances:***

<http://www.physics.sfsu.edu/policy/withdrawal.pdf>

**Plagiarism:** <http://www.physics.sfsu.edu/policy/plagiarism.pdf>

**The Disability Programs and Resource Center (DPRC):** Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY 415-338-2472), by email [dprc@sfsu.edu](mailto:dprc@sfsu.edu), or visit their website at <http://www.sfsu.edu/~dprc>

**SF State fosters a campus free of sexual violence including sexual harassment, domestic violence, dating violence, stalking, and/or any form of sex or gender discrimination. If you disclose a personal experience as an SF State student, the course instructor is required to notify the [Dean of Students]. To disclose any such violence confidentially, contact:**

[The SAFE Place - (415) 338-2208; [http://www.sfsu.edu/~safe\\_plc/](http://www.sfsu.edu/~safe_plc/)]

[Counseling and Psychological Services Center - (415) 338-2208; <http://psyservs.sfsu.edu/>]

**For more information on your rights and available resources:** [<http://titleix.sfsu.edu>]

