

## PHYS 220 Syllabus Fall 2016 Section 02

Physics with Calculus I Mechanics

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

Office TH 328, Office Hours TBA

Lecture MWF 12:35-1:50PM in TH 327; Final Tu Dec 20 10:45AM-1:15PM in TH 327.

Find our **Course Website** on <https://ilearn.sfsu.edu/>

A grade of C or higher in Math 226 or equivalent is **Prerequisites** for PHYS 220. Students will be held accountable for literally all math classes leading up to Math 226 including high school math.

**Lab PHYS 222** 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 220 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.

**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.

- After each lecture, read the corresponding chapter(s) from Serway or an equivalent physics reference book. Here are my recommendations for physics reference websites:  
<http://www.wikipremed.com>  
<http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>
- Read and review lecture notes correlating them to your book, and **then** start the Homework.

**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 02: *sfsu 7394 1956 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.

**Exams:** You will have *four* 45 minute in-class exams consisting of 5 multiple choice questions (2pt each) and 2 written response questions. Each written response question will require you to draw a diagram or graph (2pts) and derive an algebraic equation or calculation from the equations learned in class (3pts). Exams are *open notebook*, but I recommend creating a condensed 2 to 3 page summary of your notes for each exam. Exams cover 3 to 4 chapters and are *not* cumulative. (See below for grading.)

### Grade Breakdown and Weighting by Category:

Homework on WebAssign	4%
Exam 1	24%

Exam 2	24%
Exam 3	24%
Exam 4	24%
<b>Total</b>	<b>100%</b>

GRADE	PERCENTAGE	DESCRIPTION
A A-	90–100% 85–89%	Excellent.
B+ B B-	80–84% 75–79% 70–74%	Good.
C+ C C-	65–69% 60–64% 55–59%	Fair: Each course in a certificate program must be completed with a grade of C or better, although some programs have higher requirements.
D	50–54%	Barely passed.
F	< 50%	Failed.

### Course Objectives:

1. Understand spatial relationships and unit conversions.
2. Understand graphs of position and velocity versus time.
3. Know solutions to simple derivatives, integrals, and differential equation.
4. Understand the relationships between mass, momentum, forces, velocity, and acceleration. Calculate using Newton's Laws of motion.
5. Be able to read and draw free body diagrams.
6. Understand that the total momentum of a system is conserved if no external forces act on the system, and calculate using momentum conservation.
7. Understand the relationships between work, power, kinetic energy, potential energy, relative position, and speed.
8. Understand that the total energy of an isolated system is conserved, and calculate using energy conservation.
9. Understand the relationship between centripetal acceleration, speed, and radius in uniform circular motion. Use instantaneous centripetal acceleration and conservation of energy to calculate speeds along circular paths.
10. Understand the relationships between torque, moment of inertia, angular velocity, angular momentum, and angular acceleration.

11. Understand that the angular momentum of a system is conserved if no net torque acts on the system, and calculate using angular momentum conservation.
12. Be able to calculate net torque from a free body diagram of a continuous object.
13. Understand how Newton's Universal Law of Gravitation explains both the elliptical orbits of satellites and free fall near the Earth's surface.
14. Understand how restoring forces cause oscillations and store energy.
15. Know 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>]