SFSU Physics 220: General Physics with Calculus I

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Lecture: Thornton Hall 329 Office Hours: Thornton Hall 308
T/Th 12:35–13:50 T/Th 14:00–17:00

Quick note on e-mail contact

So that I can identify and respond to e-mails from you in an expeditious manner, please put [PHYS220] at the beginning of the subject line.

Important Websites

(1) www.physics.sfsu.edu/~barranco – My homepage in the Department of Physics & Astronomy.
(2) ilearn.sfsu.edu – (note: no www in web address!) Login to access course website. Please check frequently for new announcements, updates to the syllabus & schedule, tips & tricks on homework, homework solutions, and links to additional learning resources.
(3) www.webassign.com – Online homework system (see below under heading Homework).

Course Overview

This course is an introduction to Newtonian mechanics. Topics include: vectors, kinematics (velocity, acceleration, linear motion, projectile motion, circular motion, relative motion), Newton's 3 Laws of Motion and the concept of force (weight, tension, springs, friction, gravitation, etc.), linear momentum, work & kinetic energy, potential energy and conservation of energy, elastic & inelastic collisions, angular momentum, torque, rigid body statics, rigid body dynamics, and oscillatory motion.

The Physics 220 (mechanics), 230 (electricity & magnetism), and 240 (wave motion, optics, thermodynamics) series is an almost complete introductory survey of "classical" physics, suitable for students concentrating in any of the physical sciences and/or engineering.

Lectures, Office Hours

Lectures: Tuesdays and Thursdays, 12:35 – 13:50, in Thornton Hall 329.

Office hours: Tuesdays and Thursdays, 14:00 – 17:00, in Thornton Hall 308.
However, feel free to make an appointment or just drop by anytime; if I am in my office and am available, I will be glad to work with you.

Learning Materials

(1) Required: Lea & Burke, Physics: The Nature of Things, 1st edition
(2) Required: TurningPoint Audience Response System RF keypad
(3) Required: Scientific calculator
(4) Required: WebAssign access code (for online homework system)
(5) Optional: Elby, Portable TA, Volume I
(6) Optional: Student Solution Manual to Physics: The Nature of Things
(7) Optional: Celesia, Preparation for Introductory College Physics: A Guided Student Primer

Prerequisites & Corequisites

Because this course uses calculus throughout lectures and the homework, students must have completed the following prerequisites:

(1) Math 226 (Calculus I) or its equivalent, with a grade of C or better. If you did not complete this requirement at SFSU, be prepared to supply proof (e.g. unofficial transcripts from another institution) during the first week.

(2) Score of 65% on the Physics Readiness Exam (aka Math Qualification Test for Introductory Physics). This exam will be administered during the first lab meeting of Physics 222. This requirement can only be waived if you took this exam in a previous semester. The exam covers algebra, geometry and trigonometry.

In addition to the above prerequisites, students must be co-enrolled in the following:

(3) Math 227 (Calculus II),
(4) Physics 222 (General Physics I Laboratory).

Grading Scheme

Grades will be determined according to the following rubric:

Exam 1:	18%
Exam 2:	18%
Homework:	18%
Final Exam:	36%
Class Participation:	10%

Letter grades will be assigned according to the following scheme:

	A: 90.0% – 100.0%	A-: 85.0% – 89.9%
B+: 80.0% – 84.9%	B: 75.0% – 79.9%	B-: 70.0% – 74.9%
C+: 65.0% – 69.9%	C: 60.0% – 64.9%	C-: 55.0% – 59.9%
D+: 50.0% – 54.9%	D: 45.0% – 49.9%	D-: 40.0% – 44.9%
	F: 0.0% – 39.9%	

Homework

As a new professor, it is perhaps heretical to say that you cannot learn physics from lectures. You must work through many problems, seeing the theoretical concepts discussed in lecture applied in various different contexts. Homework is an integral part to the learning process; how serious you take the homework will ultimately determine how much you will understand physics and how well you will do in the course overall.

There will be approximately one homework assignment due per week. The due dates will usually be on Thursdays, but please check the online schedule frequently for updates. Homework will be submitted online via WebAssign (www.webassign.com). On the second day of class, I will give you your login and password for the system. You will have to purchase an access code online during the second week ($14.95) to continue using the service.

One of the advantages of a system like WebAssign is that your homework is graded immediately, and you will have the opportunity to correct your answers for full credit (up to 7 chances per numerical or symbolic problem, 2 chances per multiple choice question). I *strongly* suggest first writing-up your solutions on paper, complete with diagrams and explanations, before logging into the WebAssign system to enter your answers. That way, if you get the answer wrong, you can look over what you have done to identify your error. Also, you will have a record of what you have done to aid you in studying for exams.

Although you will not be graded on diagrams and explanations in WebAssign, to get full credit on exams you must include the appropriate diagrams and verbal explanations!

Classroom Participation

You should have purchased a TurningPoint Audience Response System RF keypad bundled along with the required textbook. At various points throughout the lecture, I will pause the presentation and project a multiple-choice question onto a screen. I will ask you to take a minute to think about the problem, and then select your answer, which will be transmitted to my laptop via your RF keypad. On some questions, especially warm-up questions before we have discussed a new topic, you will get all the points just for answering. Other times, especially at the conclusion of a topic, you will get some points just for answering, and some points only if your answer is correct. No matter what, always submit an answer!

Academic Integrity

You are encouraged to form study groups with your peers to discuss homework; however, you should write-up your solutions on your own, and submit only your own answers on WebAssign.

Cheating via any method on exams will result in a grade of zero on that exam and being reported to the department chair and college dean for possible discipline.

Please see the official academic integrity policy for the Department of Physics & Astronomy at: http://www.physics.sfsu.edu/Plagiar.html.

Expected Code of Conduct

Classroom discussion and participation is strongly encouraged. However, please refrain from any unrelated chatter. Also, please remember to place cell phones and other electronic communication devices on silent or vibration mode so as to not distract your fellow classmates. If you must arrive late or leave early, please sit toward the back of the room near the door so as to minimize disruption.

Disability Access

Students with disabilities who need reasonable accommodations are encouraged to contact me early in the semester. The Disability Programs and Resource Center is available to facilitate the reasonable accommodations process. The DPRC, located in Student Services Building 110, can be reached by telephone at 338-2472 (voice/TTY) or by e-mail at dprc@sfsu.edu.

Preliminary Schedule (Subject to change!)

1	Tues. Aug. 28	Introduction: course intro, SI units	1.1–1.3
2	Thur. Aug. 30	Introduction: vector algebra	1.4–1.6
3	Tues. Sep. 4	Kinematics: position, velocity, acceleration	2.1–2.3
4	Thur. Sep. 6	Kinematics: linear motion	2.4
5	Tues. Sep. 11	Kinematics: projectile motion, relative motion	3.1, 3.3
6	Thur. Sep. 13	Newton's Laws: the concept of force	4.1–4.4, 4.8
7	Tues. Sep. 18	Newton's Laws: springs, friction	4.5–4.6
8	Thur. Sep. 20	Newton's Laws: strings, pulleys	5.1–5.3
9	Tues. Sep. 25	Newton's Laws: circular motion, gravitation	3.2, 4.7, 5.4
10	Thur. Sep. 27	Catch-up & Review	Ch. 1–5
11	Tues. Oct. 2	Exam 1	Ch. 1–5
12	Thur. Oct. 4	Linear momentum	6.1, 6.3
13	Tues. Oct. 9	Linear momentum	6.2
14	Thur. Oct. 11	Work & Kinetic energy	7.1
15	Tues. Oct. 16	Work & Kinetic energy	7.2
16	Thur. Oct. 18	Conservation of energy	8.1–8.2
17	Tues. Oct. 23	Conservation of energy	8.3–8.4
18	Thur. Oct. 25	Collisions	10.1–10.3
19	Tues. Oct. 30	Catch-up & Review	Ch. 6–8, 10
20	Thur. Nov. 1	Exam 2	Ch. 6–8, 10
21	Tues. Nov. 6	Angular momentum & torque	9.1–9.2
22	Thur. Nov. 8	Conservation of angular momentum	9.3–9.4
23	Tues. Nov. 13	Rigid body statics	11.1–11.3
24	Thur. Nov. 15	Rigid body statics	11.4–11.6
25	Tues. Nov. 27	Rigid body dynamics	12.1-12.3
26	Thur. Nov. 29	Rigid body dynamics	12.4–12.6
27	Tues. Dec. 4	Oscillatory motion	14.1–14.3
28	Thur. Dec. 6	Oscillatory motion	14.4
29	Tues. Dec. 11	Catch-up & Review	Ch. 9, 11–12, 14
30	Thur. Dec. 13	Catch-up & Review	Ch. 1–12, 14
	Tues. Dec. 18	FINAL EXAM	Ch. 1–12, 14