

Contact Information

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Course Information

Lecture: 9:40–10:50 am and 11:20–12:30 Days 135
Room: 173 Peter Engel Science Center
Textbook: *University Physics* by Young and Freedman, Twelfth Edition
Web Site: <http://www.physics.csbsju.edu/~jcrumley/191/>
<https://moodle.csbsju.edu/course/view.php?id=1660>

Introduction

Physics is the most basic of sciences. It is the study of the natural world at its fundamental levels. A working knowledge of physics is needed for physicists and engineers, but it is also useful for other scientists and for people who just want to better understand the world.

In this course I have two overall goals for what I would like you to learn. Students in this class should gain:

1. a working knowledge of basic physical concepts and
2. the skills needed to solve physics problems using those concepts.

Though I have separated concepts and problem solving out as distinct goals, in practice they are intertwined. You cannot solve problems unless you understand the concepts, and you do not really understand the concepts if you cannot apply them to problems.

In this course, the concepts and topics that we will be studying are the bedrock of physics — motion, forces, and energy. The next course — Physics 200 — concerns electricity, magnetism, and circuits.

Class time

In class, we will be using a variety of techniques and activities. I will start most classes with 10 minutes or so for questions from the homework.

Next, we will cover new material. I will spend much of this time lecturing and solving problems at the chalkboard. Other activities that will be mixed in include demonstrations, group problems, and quick quizzes. For each quick quiz I will give a short problem and about five minutes to work it out on a small sheet of paper. I will collect these and grade them just based on whether or not you attempted the problem.

Listed below is a tentative schedule. Use the schedule as a rough guideline of what will happen in class on a given day, but be aware that we will almost certainly fall behind schedule at times, and we may even get ahead of it once or twice. You are responsible for attending class, or if you miss class finding out from your classmates what you missed. If any changes are needed in the test schedule, I will give advanced notice.

Group Problems

In order to give you practice on working on more complicated problems, you will be working in groups of three or four on some problems in class. You will get a chance to work on practice group problems in class, and then as part of each test you will also have a group problem to work on. After each test I will assign new groups.

Homework Problems

Assigned homework problems for each chapter of the book are included below. Occasionally I may assign extra problems that are not from the book. The problems from each chapter will be due the class day after we have finished covering that chapter in class (e.g. — the problems from Chapter 1 will be due August 31). You should consider the assigned problems a minimal set of problems to solve. If you are having difficulty with the material, then you should do **more** problems. Being able to solve problems is necessary in order to be successful on the tests.

The answers for some of the problems are given at the end of the chapter, and some are not. This mix of problems is intentional. Learning to check your own work is an important skill, and after you leave school you won't always have "right" answers to check against.

Solving physics problems can be difficult, so I encourage you to work in groups on problems, and get help from the TAs and myself when you need it. When working in groups, each group member must write their own solutions and must understand the solutions they hand in. simply copy solutions that you get from another student, or that you find online, is plagiarism and will be dealt with following the schools' plagiarism policy.

Problem sets will be graded by a grader and/or by me. Please be organized and neat, so that the grader can understand your solution. Please label your problems clearly, show your work, and leave space between your problems. If you have more than one sheet of paper, staple the sheets together. If you rip your paper out of a notebook, please cut off the hanging chads. Unless you are infallible, please use pencil and erase when necessary.

Homework must be turned in by 4 pm to my office on its due date, unless I announce otherwise in class. Late homework will not be accepted, though you will be able to drop your lowest score from the semester.

Lab Information

Labs are held in rooms PE 102 and 106 on Days 4-6. In lab you will either Dr. Todd Johnson or Dr. Dean Langley as an instructor, as well as a TA. For lab, you need to have the lab manual and two lab notebooks, both of which can be purchased at the SJU bookstore.

Before each lab make sure that you read the write-up for the lab and do any pre-lab exercises that are mentioned. If for any reason you need to miss a lab, contact Lynn Schultz, the physics department lab manager (lschultz@csbsju.edu), **before** lab.

Tests

The tests will have two parts: an individual portion and a group portion. The individual portion of the tests will consist of short answer questions and problems. The group portion of the tests will consist of a more difficult problem that you will solve as a group and hand in one solution. The group test will take place on the class period before the regular test. The final test will be solely an individual effort.

All of the tests will be closed book and closed notes. You will be given a sheet with all of the equations and constants that you need for the test, though you will have to remember how to apply them.

Grading

The grades in this class will be based on 7 items: 3 tests, the final exam, lab, homework, and participation. Each of the 3 tests will be worth 13% of the overall grade, while the final exam will be worth 21%, lab and homework will be worth 15% each and quiz/participation will be worth 10%. The participation grade will be based on participation in the practice group tests, quizzes, and other exercises in class.

Grades in this class will be curved based on the class average and my evaluation of how the class has done as a whole. After each test, I will give you a rough curve to give you an idea of how you did on that test. Those curves are for informational purposes; it is only the final curve which really matters.

Course Schedule

Cycle	Date	Sections	Topics	Tests	Homework	Lab (Days 4–6)
1-1	W 8/25	1.1–5	introduction & units		6, 9, 20, 29, 63	No lab
1-3	F 8/27	1.6–1.10	vectors and velocity		41, 72, 76, 95	
1-5	T 8/31	2.1–2.4	velocity & acceleration	practice group	10, 19, 57	
2-1	R 9/02	2.5–2.6	freefall	practice group	25, 38, 45, 53, 69, 77	Data Analysis
2-3	T 9/07	3.1–3.3	2-D motion		7, 47, 58, 64, 67	
2-5	R 9/09	3.4–3.5	relative velocity		32, 41, 50, 68	
3-1	M 9/13	4.1	force	practice group	6	Free Fall
3-3	W 9/15	4.2–4	Newton's 1st and 2nd		13, 16, 20, 35	
3-5	F 9/17	4.5–6	Newton's 3rd Law		21, 26, 39, 48, 53	
4-1	T 9/21	1–4	Review	Group Test 1		Reaction Time
4-3	R 9/23	1–4	kinematics, forces	Test 1		
4-5	M 9/27	5.1–2	equilibrium		10, 19, 61, 69, 72	
5-1	W 9/29	5.3–5	friction & circular motion		55, 76, 84, 104	Projectile
5-3	F 10/01	6.1–3	work and kinetic energy		9, 22, 37, 40, 56	
5-5	T 10/05	6.4	power	practice group	44, 47, 69, 81	
Long Weekend						
6-1	M 10/11	7.1–3	potential energy		5, 20, 30, 41, 61	Atwood Machine
6-3	W 10/13	7.4–7.5	energy conservation		34, 37, 56, 79	
6-5	F 10/15	8.1	momentum	practice group	3, 12	
7-1	T 10/19	8.2–3	conservation of momentum		15, 18, 36, 39	Friction
7-3	R 10/21	8.4–6	collisions		45, 49, 60, 64, 95, 100	
7-5	M 10/25	5–8	Review	Group Test 2		
8-1	W 10/27	5–8	energy and momentum	Test 2		Ballistic Pendulum
8-3	F 10/29	9.1–3	rotational kinematics		5, 18, 31, 72	
8-5	T 11/02	9.4–6	rotational energy		37, 50, 58, 67, 68, 77	
9-1	R 11/04	10.1–3	torque		3, 10, 23, 78	Two Body Collision
9-3	M 11/08	10.4	work and power	practice group	54	
9-5	W 11/10	10.5–7	angular momentum		37, 41, 52, 91	
10-1	F 11/12	11.1–4	equilibrium		3, 5, 16, 22, 62, 77	Rotational Dynamics
10-3	T 11/16	11.5	elasticity	practice group	39, 86	
10-5	R 11/18	12.1–4	gravity		8, 22, 24, 31	
11-1	M 11/22	12.5–8	mass distributions		36, 39, 47, 60, 76, 78	Lab Practical
Thanksgiving Break						
11-3	M 11/29	9–12	Review	Group Test 3		
11-5	W 12/01	9–12	rotation, and gravity	Test 3		
12-1	F 12/03	13.1–4	simple harmonic motion		4, 11, 23, 33, 81	SHM
12-3	T 12/07	13.5–8	pendulum & damped osc.		47, 52, 57, 60, 90	
12-5	R 12/09	1–13	Review			Assessment Test
FW	T 12/14		1–3pm or 3:30-5:30 pm	Final Exam		