PHYSICS 125L: Physics for Architects
COURSE INFORMATION
Spring 2020

Course Description

Physics 125L is an algebra based physics coursed designed specifically for architects! The ultimate goal of the course is to teach you how to approach and solve physical problems, and to develop an intuition for the important physical properties that affect a given situation, with an emphasis on architecture related physics. Mechanics (motion, equilibrium, conservation laws), Thermodynamics, Waves (earthquakes, light and sound), and Electricity will be the main topics we will cover in the course, with Mechanics taking up the majority.

Some of you will have never taken a physics course before and have math anxiety, and some of you will have aced your high school physics courses, so there's a bit of a challenge with this course. However, just know that I try to keep all of you in mind when I teach. The good news is that taking a physics course is the ultimate way to learn to solve problems. In my humble opinion the world would be a better place if everyone had to take a physics course at least once in their life. This is your time… and I'm here to walk you through it.

Course Instructor

Chris Sutherland
Email address: cjsuther@usc.edu
Office: SHS 361
Office hours: Mondays & Wednesdays 10:30am-11:30am, Tuesdays & Thursdays 11am-noon, in SHS 363, the conference room across from my office. Take the elevator up and go toward the building that is to the right of the elevator on the third floor. I will also livestream them at https://www.twitch.tv/sutherlandphys , it's free to make a Twitch account and you can type questions in the chat for me to answer. I might stream on twitch at other times if there is interest/need from you guys.

Please reach out to me if you are struggling with the course for whatever reason, I am always happy to talk about anything and everything and set you on a path to success.

Course Materials

A. Textbook

Free! OpenStax College Physics https://openstax.org/details/books/college-physics?Book%20details

B. Required for the Laboratory

Laboratory Manual (Department of Physics and Astronomy, current term). The Laboratory Manual is provided on the lab's Blackboard site. You need to print it out because you write the answers to the lab on the lab manual itself and hand it in at the end of every lab session to be graded. No need to worry about the lab when the lab section is over this way. You will need to read the Manual in advance of your lab meeting in order to answer the online pre-lab questions. More

about the lab under the Grading section of the syllabus.

All questions about the lab: Dr. Gohkan Esirgen esirgen@usc.edu
The lab is a separate part of the course that I essentially have no control over. Sorry!

Administrative stuff

A. Prerequisites

There is a corequisite for this course and it is Math 108 (Contemporary Precalculus).

B. Registration

Your registration for this course consists of two separate parts: a lecture, and a laboratory. You have to be registered for one of each. (The exception is if you have previously completed the laboratory and have received permission to carry its grade into the current semester and have given the permission form to your instructor. In that case you would register only for the lecture. The laboratory sections meet once a week for two hours on Friday.

C. Disabilities

DSP letters due by the end of second week of classes.

Students who need to request accommodations based on a disability are required to register each semester with the Disability Services and Programs. In addition, a letter of verification to the instructor from the Disability Services and Programs is needed for the semester you are enrolled in this course. If you have any questions concerning this procedure, please contact the course instructor and Disability Services and Programs at (213) 740-0776, STU 301."

D. Academic Integrity

Students who violate university standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the university. Since dishonesty in any form harms the individual, other students and the university, policies on academic integrity will be strictly enforced. The academic integrity guidelines can be found in

(i) The Trojan Integrity Guide,
http://www.usc.edu/student-affairs/SJACS/forms/tio.pdf

(ii) The Undergraduate Guide for Avoiding Plagiarism,
http:/www.usc.edu/student-affairs/SJACS/forms/tig.pdf

E. Classroom Behavior

If you need to use your computer in lecture because you stayed up all night in studio again and forgot to send Becky the powerpoint slides for your history of architecture class and there's a quiz this Friday, that's OK, I understand, just sit in the back two rows of the lecture hall so the other students don't get distracted by your sick noscope in Fortnite or pentakill in League of Legends.

Grading

A. Grading Breakdown

The grading scheme will be as follows:

Grade Component	Weight
Homework	15%
Midterm 1	20%
Midterm 2	20%
Final Exam	25%
Laboratory	20%

The Laboratory component of the course has the following grade breakdown:

Grade Component	Weight
Pre-lab quiz	20%
Lab performance	40%
Lab write-up	40%

Everyone in the course will be given the same laboratory projects, the same midterms, the same homework assignments, and the same final exam.

B. Minimum Requirements for Passing the Course

In order to receive a passing grade in the course, you have to pass ***both*** the lecture ***and*** the laboratory portions. Specifically, you must earn a **minimum score of 70% on the laboratory portion of the course in order to pass the course as a whole.**

Additionally, **at least 75% of all homework assignments must be turned in** (typically 9 out of the 12 assignments that are due). Partial submissions (you only did some of the questions but couldn't finish) count as submissions.

C. Homework Assignments

There will be a homework assignment every week. They will be due **Thursdays in class.** These problems are designed to help you do well on the midterms/exams. **However, if you memorize how to do all the problems on the homework/ in class examples / lecture notes, you will do bad in the course.**

How to do well in the course: Use the homework to test your understanding of the physics. If you can't do the homework first try, don't look up the answers online, instead read the textbook, lecture notes, example solutions, and try again. **This method will help you do better on the tests, and pretty much everyone gets 100% on the homework anyway, so it's the tests that set the curve.**

No late homeworks will be accepted, because I will be dropping your two lowest homework scores without question. I'm strict about this because accepting late homeworks makes my job harder

and I would much rather just drop your two lowest homework scores. You can finish that homework that you couldn't get done because Trevor/Marissa broke up with you on your own time when you get over it (they didn't deserve you, trust me).

D. Examinations

There will be two Midterm Examinations (**Thursday Feb. 20th,** and **Thursday March 26th, starting at 930am in SLH 200**) and a Final Exam (**Tuesday, May 12th from 8:00am to 10:00am, location TBA).** The midterm exams will last 60 minutes. The Final Exam will last 120 minutes and will be comprehensive of the entire semester. **No rescheduling under any circumstance, sorry.**

All exams are closed-book and closed-notes. However, I will include equation sheets in each exam similar to those provided in previous semesters. Numerical constants will also be provided.

Students with special examination requirements as documented by the Office of Disability Services please give me your PDF document with your required accommodations **by the second week of classes**.

E. Laboratory

All questions about the lab: Dr. Gohkan Esirgen esirgen@usc.edu
The lab is a separate part of the course that I essentially have no control over.

At every laboratory meeting you need to **print out and bring the relevant experiment from the Lab Manual on Blackboard. The first lab is during the first Friday of classes.** I would suggest printing out the entire Lab Manual at the beginning of the semester, separating and stapling each experiment together, and bringing the relevant one to your lab meeting each Friday.

Laboratory grades are determined by 1. A pre-lab quiz due before your lab section meets, 2. Your performance during the lab, and 3. Your lab write-up turned in at the lab's conclusion.

You can't attend other lab section times because all the lab sections are full. So if you got the 8am lab, you can only go to that one, sorry! There will be a chance to make up 1 or 2 missed labs at the end of the semester however.

Complete details about lab grading and make-up policies are provided on the laboratory section's Blackboard site. Other questions concerning the laboratory should be referred to the Lab Director, Gökhan Esirgen, KAP B19, (213) 740-1138, esirgen@usc.edu.

Assistance

Here are the things the physics department has set up to help you reach your goals. Your home department may provide others!

A. Lectures

Please come to lecture. There will be group activities that I track attendance with so I know who has been coming to class and who hasn't when I'm considering final grades at the end of the semester. I'm going to be livestreaming the lectures on Twitch/YouTube, and you will be able to watch the vods of these if you miss lecture (maybe for a price ;)).

B. Instructor Office Hours

For more personal attention, please come to my office hours. If at all possible, come to the regularly scheduled office hours listed at the top of the syllabus. However, if your schedule conflicts with this, it is possible to schedule an appointment at a different time by e-mailing me or approaching me after

lecture.

C. Your Laboratory T.A.

All laboratory teaching assistants are graduate students, usually pursuing a Ph.D. in Physics. They are all capable of answering any question you have regarding subject material. Usually your lab TA can answer your question immediately. You should regard your laboratory TA as a resource not only for the laboratory, but also for all physics questions.

D. T.A. Office Hours - ACB 431

All laboratory teaching assistants have office hours in ACB 431 for the assistance of students in all 100-level physics courses. The offices will be staffed with at least one TA from 10 am to 4 pm, Monday through Thursday until the end of classes. The schedule of every TA's office hours will be constructed during the first week of classes and will be posted on the door of the Office Hours room and maintained on the Departmental Web site at http://dornsife.usc.edu/physics/teaching-assistant-resources. If you go at a particular time and don't find the TA helpful, try another hour where there will be a different TA.

E. Study Groups

One of the most effective ways to learn new material is to teach it to others. Get together and do some physics, sounds fun right? Well, it will make it a lot more bearable this way. Also, teaching others about the way you thought about / solved a problem is the best way to learn. I don't think I learned anything that well until I started having to teach it!

F. Published Solutions

Images of midterms and final examinations from previous semesters will be made available on Blackboard. Solutions to all homework sets will become available some time after you have submitted them for grading.

G. Tutors

The Department of Physics and Astronomy does not recommend tutors. The principal function of a tutor is to enforce a regular study of course material. This function, however, is served as well by working together with other students in the course and it's much less expensive.

H. Student Ombudsman

All courses in the Department of Physics & Astronomy have an assigned Student Ombudsman to serve students as a confidential, neutral, informal, and independent resource when they wish to discuss issues concerning their course without directly confronting their instructor. The Student Ombudsman for this course is Chris Gould, gould@usc.edu, 213-740-1101, SSC 204.

Electronic Assistance

Everyone in this class has convenient access to the USC network. If you do not already know what your account name is, you should use your favorite Web browser to reach http://www.usc.edu/firstlogin and follow the instructions there. To get help on using the USC network visit http://itservices.usc.edu.

A. E-mail

This is the best way to talk to me. My email is cjsuther@usc.edu. Put "Physics 125" in the subject line because I'm teaching 3 courses with 250 students and am already scatter brained enough as it is. **Please don't email me homework questions**. It's just to make my inbox a bit more manageable, and the resources listed above should be sufficient for you to complete the homework. I'm happy to answer homework questions in office hours! Email about anything else is good: general physics questions, course concerns, business opportunities, donations, bribes… (jk)

B. Blackboard

Everyone registered in PHYS 125 should find two separate "courses" already set up within their Blackboard account (https://blackboard.usc.edu), one for the lecture and a separate one for the laboratory. In the lecture course you will find a copy of the syllabus, homework assignments, important news and announcements, and solutions to examinations in this and previous semesters.

C. Social Media

I have an Instagram, Youtube, Twitch, Twitter, TikTok, OnlyFans (jk), all @sutherlandphys. I'm going to shamelessly use some subset of them. Please help me know what you think would be helpful to you guys. Please let me know if I'm being "cringe".

Course Calendar and Important Dates

January 13th	Classes Begin
January 20th	Martin Luther King Jr's Birthday
February 17th	President's Day
February 20th	Midterm 1
February 28th	Last day to drop class without a mark of "W," and last day to change enrolment option (no refund though)
March 16th-20th	Spring Break
March 26th	Midterm 2
April 3rd	Last day to drop class with mark of "W"
May 1st	Spring semester classes end
May 12th	Final Exam

Course Schedule

#	Week of	Topic	Reading
1	Jan.13th	Intro to Physics units and Vectors	Ch.1
2	Jan.20th	Kinematics	Ch.2
3	Jan.27th	Kinematics in 2D, Newton's Laws, Friction	Ch.3, Ch.4
4	Feb. 3rd	Free Body Diagrams, Applications of Newton's Second law, Static Equilibrium, Stress and Strain	Ch.4, Ch.5
5	Feb.10th	Statics and Torque	Ch.9
6	**Feb.17th**	**Midterm 1 Review + Midterm 1 (Feb.20th)**	Ch.1-Ch.5,Ch.9
7	Feb.24th	Work, Energy, and Energy Resources	Ch.7
8	Mar.2nd	Oscillatory Motion of Waves	Ch.16
9	Mar.9th	Heat and Thermodynamics	Ch.14, Ch.15
10	Mar.16th	Spring Break	
11	March.23rd	**Midterm 2 Review + Midterm 2 (Mar.26th)**	Ch.7-Ch.9
12	March.30th	Heat and Thermodynamics continued	Ch.14, Ch.15
13	April.6th	Optics	Ch.16
14	April.13th	Electricity	Ch.18-21
15	April. 20th	Electricity continued	Ch.18-21
16	April.27th	Final Exam Review	All
***** FINAL EXAM Tuesday, May 12th from 8:00am to 10:00am, Location TBA*****			