# PHYSICS 100LG - FALL 2022 – PRELIMINARY SYLLABUS

***** Please make sure to see me ASAP if you were not present on the first day of class or enrolled late for the course*****

Prof. Vahé Peroomian
*Email address*: peroomia@usc.edu (best way of contacting me!)
*Office:* SHS 360
*Office hours:* **In person:** Wednesdays 3:30pm – 4:30pm, Fridays 12:30pm – 2:30pm,
**Zoom (**https://usc.zoom.us/my/peroomian**):** Thursdays 10:00am – 11:00am
*and by appointment*

## COURSE DESCRIPTION

Welcome to Physics 100! Physicists haven't come up with "physics makes the world go 'round!" to make themselves look important, they've come up with it as a gentle and constant reminder that this statement is 100% true. To quote a colleague here at USC, *physics seeks to understand the fundamental patterns underlying all of nature in a quantitative and predictive way*.

This course is a journey that begins in ancient times, when science and philosophy were intertwined, and often confused with one-another. Leaving the ancients behind, we ride the scientific revolution to our current understanding of the scientific method and how science research is carried out. Along the way, we may pick up a habit of thinking critically about the world we live in. We explore everything from curving free kicks in soccer, rocket flight and how the New York Times ridiculed Robert Goddard, the "father" of modern rocketry, how the spin of a figure skater is related to the process by which the planets in our solar system formed, black holes, dark matter (ok, maybe not… we still don't know what it is!), and more mundane matters like walking on hot coals and why the sky is blue. Imagine how popular you'll be at dinner parties, once we start having them again!

This course is designed specifically for those non-science majors who have very little, if any, background in the sciences and mathematics. The course is non-mathematical by prerequisite, but you will have to learn to do some calculations. However, these calculations will be very simple and will employ formulae that are easy to remember. You will have the opportunity to note that formulae represent ideas.

## 1. TEXTBOOK

***Conceptual Physics***, 12th Edition, by Paul G. Hewitt (Pearson), Pearson, 2016.
We will **NOT** be using the Mastering Physics website/homework system, and rented/used (and 11th edition) textbooks will be ok.

## 2. GUIDELINES.

### 2.1 Registration and administration

Your registration for this course consists of two separate parts: the lectures and the laboratory. You must register for each of them. *The Undergraduate Physics Office in ACB 439 deals with all administrative aspects of this class. Additional help regarding administrative issues is available in that office in person, by phone at (213) 740-1140 or (310) 740-0848, and by email at physics@dornsife.usc.edu.*

### 2.2 Disabilities

Students who need to request accommodation based on disability are required to register each semester with the Office of Student Accessibility Services (OSAS). This office can be found at STU 301 with phone number 213-740-0776. A letter of verification to the instructor from OSAS is needed for the semester you are enrolled in. If you have any further questions please contact the OSAS office or the instructor. **Please note that you need to send the**

**instructor a copy of your accommodation letter as the instructor doesn't automatically receive this information.**

### 2.3 Grading

Your grade will be determined according to the following key:

*80% lectures:*

15% Homework
40% Midterms (best two out of three, 20% each)
25% Final exam

*20% laboratory*

Broadly speaking, grading is done by the distribution curve of the combined scores of exams, homeworks and lab. No rigid percentage marks (such as, e.g., a rule that 90% corresponds to an A–, or similar) are used. Further details about the grading procedure are given in class. **You cannot pass the course if you do not earn a passing grade (14/20 or 70%) on the lab portion of the course.**

**Students taking the course Pass / No Pass must reach a minimum overall score of 70% to pass the course, regardless of the manner in which letter grades are assigned to students taking the class for a letter grade.**

### 2.4 Attendance

Attendance is **not** mandatory in this course. However, many of the class announcements will be made during lecture, and it is your responsibility to make sure you don't miss important announcements.

### 2.5 Exams

There will be three 50-minute midterm exams and one 80-minute final exam consisting of multiple choice and fill-in-the-blank questions. The midterms will be given during the lecture that they are scheduled in. Of the three midterms, only the scores of the two highest will be counted, and the score of the lowest of the three will be dropped. The midterms will cover the course material incrementally throughout the semester, and the final exam will cover the whole course. **All exams are closed book.**

***Please note that the third midterm exam can serve as a make-up exam for either of the first two exams. There will not be any other make-up exams. Any student missing two of the three midterms will only have recorded the points scored on the one exam taken.***

### 2.6 Homework

There will be 7 homework assignments, due every other week, at midnight on Fridays. Homework can be turned in up to 24 hours late for 50% credit. Homework will consist of 10 short answer questions that will become available on Blackboard as soon as the deadline for the previous assignment passes. Homework will be turned in on Blackboard. Please note that exceptions will not be made to homework deadlines, except for medical emergencies.

I expect that it will take a couple of hours to complete each of your homework sets. The homework sets are the central means by which to master the course material, and, consequently, to perform well in the exams.

**Your responses to the homework questions must be in your own words, and not copied/pasted from other sources, including other students. Students that are found to have plagiarized their homework answers will receive a 0 on that assignment. A second offence will result in referral to USC's Student Judicial Affairs and Community Standards and an automatic F in the course.**

Homework will count for 15% of your total score. Each of the 7 assignments listed below will be worth 100 points, and a cumulative score of 500 out of the maximum 700 points will equate to a 100% homework grade (this is equivalent to, but better than, dropping two homeworks as you can use all 7 assignments plus the bonus to reach the 500 points).

**Homework Schedule**

Homework #1 Due: Friday, September 9, 2022

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| Homework #2 | Due: Friday, September 23, 2022 |
| Homework #3 | Due: Friday, October 7, 2022 |
| Homework #4 | Due: Friday, October 21, 2022 |
| Homework #5 | Due: Friday, November 4, 2022 |
| Homework #6 | Due: Friday, November 18, 2022 |
| Homework #7 | Due: Friday, December 2, 2022 |

## 2.6 Laboratory

The course Physics 100 has a **mandatory** laboratory component, and you should already be signed up for one of the laboratory sessions. The purpose of the laboratory is to give you some feeling for making and interpreting observations, thereby reinforcing some of the course material by direct experience. Indeed, without such experience, some of the theoretical material could appear a little too abstract.

**Note that late registration in the course will NOT excuse you from any labs you've missed, and you must contact the Lab Director, Joseph Vandiver (Email: vandiver@usc.edu) IMMEDIATELY if you've signed up late for the course.**

I hope that our laboratory will enhance your experience and enjoyment of this course. Please appreciate the great logistical complexity of arranging laboratories for so many people with such a broad variety of backgrounds: I therefore kindly request your good will and patience in this enterprise.

Questions concerning the laboratory should be referred to the Lab Director, Joseph Vandiver (Email: vandiver@usc.edu).

**A lab schedule will be posted to the final syllabus as soon as it is available.**

## 3. SUPPORT

You have a variety of opportunities for support available to you.

### 3.1 LECTURE

Do not underestimate the value of questions during the lecture period. In large lectures, many students are reluctant to pose questions that they fear might seem silly to their instructor or to their peers. Almost always, if one student asks a question, there are several other students who were wondering about the same issue. Often such questions tell the instructor what material might benefit from a more detailed discussion.

### 3.2 Instructor office hours

I welcome everyone to my office hours, whether it is to chat about astronomy, photography, a course-related question or issue, or any concern you may have that you'd like to share with me. I will have four hours of office hours each week, but these office hours will be open to all of the courses that I teach. Three hours of office hours will be held in SHS 360/363, and one hour per week will be on Zoom (please see first page of this syllabus). Most of my time is filled by teaching or office hours, but if I'm in my office during other times, you're welcome to stop by for a quick question (less than five minutes). You can also make an appointment to see me if you cannot make it to any of the office hours listed on the first page of the syllabus. In this case, it is best to contact me by email at least one day before you'd like to meet, or see me immediately after class.

### 3.3 Contacting Me

Emailing me at peroomia@usc.edu is the best way of contacting me. I will answer emails within 24 hours at the latest, and often much sooner, including weekends.

### 3.3 ELECTRONIC ASSISTANCE

Everyone registered in this course should find a link to the course in their *Blackboard* account. All information about the course will be posted on *Blackboard* at http://blackboard.usc.edu.

At this address, you will find this Syllabus, important announcements, homework sets, etc. Solutions to your homework sets (after the due date) will be placed on *Blackboard*.

## 4. OBTAINING YOUR GRADES

You will be able to access your grades in Physics 100 via *Blackboard* at http://blackboard.usc.edu.

## 5. FACULTY LIAISON

All courses in the Department of Physics & Astronomy have an assigned Faculty Liaison 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 Faculty Liaison for this course is Prof. Jack Feinberg (feinberg@usc.edu, 213-740-1134, SSC 327).

## 6. FEEDBACK

Feedback regarding all aspects of these lectures is very much appreciated and welcome at any time. Please get in touch with your instructor via email, after lectures, or during office hours.

## 7. STATEMENT ON ACADEMIC CONDUCT AND SUPPORT SYSTEMS

### 7.1 ACADEMIC CONDUCT:

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism

in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

### 7.2 SUPPORT SYSTEMS:

*Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call*
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

*National Suicide Prevention Lifeline – 1 (800) 273-8255*
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

*Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call*
Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

*Sexual Assault Resource Center*
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

*Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086*
Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu
*Bias Assessment Response and Support*
Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

*The Office of Student Accessibility Services*
Provides certification for students with disabilities and helps arrange relevant accommodations. osas.usc.edu

*Student Support and Advocacy – (213) 821-4710*
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

*Diversity at USC*
Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

*USC Emergency Information*
Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

*USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.*
Provides overall safety to USC community. dps.usc.edu

## 8. SOME USEFUL DATES

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| August 22 | Fall semester classes begin |

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| September 5 | Labor Day (University Holiday) |
| September 9 | Last day to drop class without a mark of "W," and last day to change enrolment option |
| September 28 (Wednesday) | Midterm 1 |
| October 13 – 14 | Fall Recess |
| October 19 (Wednesday) | Midterm 2 |
| November 11 | Veterans' Day (no classes) |
| November 11 | Last day to drop class with mark of "W" |
| November 16 (Wednesday) | Midterm 3 |
| November 23 – 27 | Thanksgiving Break |
| December 2 | Fall semester classes end |
| **Wednesday December 7, 11:00am – 1:00pm** | **Final exam** |

## 9. COURSE SCHEDULE

You should read through the relevant chapters prior to coming to the lectures each week, and review them again after each lecture before attempting the homework problems.

| Week | Required reading |
|---|---|
| 1 | Chapter 1: About Science<br>Chapter 2: Newton's First Law of Motion |
| 2 | Chapter 3: Linear Motion<br>Chapter 4: Newton's Second Law of Motion |
| 3 | Chapter 5: Newton's Third Law of Motion<br>Chapter 6: Momentum |
| 4 | Chapter 7: Energy<br>Chapter 8: Rotational Motion |
| 5 | Chapter 9: Gravity<br>Chapter 10: Projectile and Satellite Motion |
| 6 | Chapter 11: The Atomic Nature of Matter<br>Chapter 12: Solids<br>Chapter 13: Liquids<br>Chapter 14: Gases |
| 7 | Chapter 15: Temperature, Heat, and Expansion<br>Chapter 16: Heat Transfer<br>Chapter 17: Change of Phase |
| 8 | Chapter 18: Thermodynamics<br>Chapter 19: Vibrations and Waves<br>Chapter 20: Sound |
| 9 | Chapter 21: Musical Sounds<br>Chapter 22: Electrostatics |
| 10 | Chapter 23: Electric Current<br>Chapter 24: Magnetism |

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| 11 – 14 | The reading schedule for weeks 11 – 14 will be determined based on the progress made in previous weeks and will be announced by the 9th week of classes. |