

PHYSICS 162 – ADVANCED PRINCIPLES OF PHYSICS  
FALL 2020

Prof. Gene Bickers

Synchronous lecture hours: TuTh 2–3:50 PM PDT

Synchronous office hours: TuTh 4–6 PM PDT and by appointment

NOTES

Physics 162L is the second course in a three-semester accelerated sequence in introductory physics. Math 226 or 229 (Calculus III) is a prerequisite. Vector calculus will be employed at a considerably more advanced level than in Physics 152L or 172L. Electrostatics and magnetostatics, electrodynamics and the basic physics of electromagnetic waves will be covered this semester.

TEXTS:

Purcell and Morin: *Electricity and Magnetism*, Third Edition, Cambridge University Press.

**Be sure to use the Third Edition! The earlier editions employ a different unit system.**

Physics 152L/162L Laboratory Manual (online)

ONLINE COURSE SUPPORT:

The PHYS 162 home page is at

<https://blackboard.usc.edu> .

Under the home page you will find

- a copy of this lecture syllabus and schedule
- a complete set of mp4 lecture videos, including more material than we will be able to cover
- homework and quiz assignments
- solutions for completed homework
- copies of examinations from previous semesters
- QuickTime and mp4 videos for help with the problem sets.

HOMEWORK:

Homework will be assigned every seven to ten days. **Use of solutions from previous semesters or online sources is an academic integrity violation.** Two or three take-home “quizzes” (essentially pledged homeworks sets) will be assigned over the course of the semester. **No outside help or collaboration is allowed on these quizzes.**

Each homework set or quiz has a target date. If an assignment is submitted online before 9 AM Pacific time on the day following the target date, it is considered on-time. If the assignment is turned in later than that, “late days” are assessed. Note that Blackboard automatically records a date stamp.

**Everyone is allowed up to ten late days over the course of the semester with no point penalty.** You may choose to use late days on homework sets or quizzes as you see fit. Weekends and holidays do not count toward the late-day total.

Your late day total will be updated online whenever you turn in an assignment. Once the tenth day is reached, any subsequent assignment must be turned in by the target date in order to receive full credit. If you turn in an assignment that pushes your late-day total to exactly eleven days, that one assignment will receive half-credit. Any assignment after that must be turned in by the target date to receive any credit.

The homework problems are generally very challenging. Help with homework problems is provided in online video directory. **It makes sense to try working problems first before turning to a video for clarification.** Homeworks will be graded online, and homework solutions will be posted.

#### LABORATORY:

Since the Physics Department is providing at-home lab kits this semester, everything depends on the date at which the kits are delivered. **It appears now that labs will not start until Week 3 or 4 at the earliest.** There is nothing to purchase for the lab, and the Department is providing instructors with updates. I'll let you know more as soon as I hear.

The laboratory grade determines 20% of the final course grade. Questions concerning the laboratory should be referred to your TA or the laboratory director Dr. Gökhan Esirgen (esirgen@usc.edu).

#### EXAMS:

There will be two midterm exams and a final exam. All exams will be open-book, with several days allowed for completion. Midterm 1 will be posted on **Thursday, October 1**, and Midterm 2 on **Tuesday, October 27**. The final exam will be posted on **Thursday, November 12**. The course grade will be based on classroom and laboratory grades – 80% from the classroom and 20% from the lab.

The classroom grade will be based on the following distribution of points:

Midterms	$2 \times 200 =$	400
Homework		200
Quizzes		150
Final		250
		—
	Total:	1000

Please seek assistance immediately if you are having difficulty with the course. Help is available from me and any of the teaching assistants.

#### STUDENTS WITH DISABILITIES:

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

#### 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 Professor Chris Gould, [gould@usc.edu](mailto:gould@usc.edu).

#### ACADEMIC INTEGRITY:

Homework assignments may be done in collaboration with other students, and help is also available as noted above. **Under no circumstances should students seek out homework solutions from alumni of Physics 162 or from any other printed or online source.**

Quizzes are essentially PLEDGED homework sets. **Collaboration on quizzes is not allowed.** The other rules for homework hold for quizzes.

Failure to abide by these rules will result in an automatic zero for the assignment and a report to the Office for Academic Integrity.

#### IMPORTANT DATES

Last day to add classes or receive a tuition refund – Friday, September 4  
Midterm 1 posted – Thursday, October 1  
Midterm 2 posted – Tuesday, October 27  
Last day to withdraw with a mark of “W” – Friday, November 6  
Last day of class – Thursday, November 12  
Final Exam posted – Thursday, November 12

## SCHEDULE

Week	Start date	Subject
1	8/18	vector fields, Coulomb's Law, electric field
2	8/25	electric field, integral and differential forms of Gauss's Law
3	9/1	electrostatic potential, conservative fields
4	9/8	conductors, Poisson's Equation and image charges, capacitors
5	9/15	capacitors, current, resistivity
6	9/22	single- and multi-loop circuits, Thévenin's Theorem
7	9/29	RC circuits, transient and steady-state currents
		<b>• Midterm 1 posted - October 1 •</b>
9	10/6	special relativity (SR) review, SR and the electromagnetic field, fields due to moving charges
10	10/13	Ampère's Law, Biot-Savart Law
11	10/20	integral and differential forms of Faraday's Law
12	10/27	inductance, magnetostatic energy, transformers
		<b>• Midterm 2 posted - October 27 •</b>
13	11/3	AC current and circuits, complex voltage and impedance
14	11/10	Maxwell's Equations
		<b>• Final Exam posted - November 12 •</b>