

PHYSICS 162 – ADVANCED PRINCIPLES OF PHYSICS
FALL 2019

Prof. Gene Bickers
Office: ACB 439H
Phone: 740–1114
Office hours: TuTh 4–6 PM

Lecture hours: TuTh 2–3:50 PM
Lecture location: SLH 102

NOTES

Physics 162L is the second course in a three-semester honors sequence in introductory physics. Math 226 (Calculus III) is a prerequisite. Vector calculus will be employed at a considerably more advanced level than in Physics 152L or 172L. Electrostatics, 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 buy the Third Edition.

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 lecture videos from the Fall 2018 semester
- homework and quiz assignments
- scanned images of solutions for completed homework
- copies of examinations from previous semesters
- QuickTime webcasts for help with the problem sets.

HOMEWORK:

Homework will be assigned every seven to ten days. **Use of solutions from previous semesters 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 turned in to ACB 439H before 9 AM 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.

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.

Help with challenging aspects of some homework problems is provided online in an archive of webcasts. **It makes sense to try working problems first before turning to a webcast for clarification of specific points.** Graded homework will be returned in class. Images of homework solutions will be posted online.

LABORATORY:

The first laboratory sessions will be held during the week of August 26 (Week 1). These sessions are purely informational, and you should be out in twenty minutes. Be sure to be present at your first session to confirm your enrollment.

Physics is an experimental science, and the laboratory is an important part of any physics course. In Physics 162 (and 152), the laboratory is run on a separate basis from the lecture portion of the course. The procedures to be followed in the lab will be explained by the lab instructors at the first meeting. The lab manual is available online.

The laboratory grade determines 20% of the final course grade. If you miss a laboratory period, *you* must make arrangements with your TA to make up the missing experiment. Questions concerning the laboratory should be referred to your TA or the laboratory director Dr. Gökhan Esirgen (KAP B-19, esirgen@usc.edu).

EXAMS:

There will be two midterm exams and a final exam. The midterm exams will be given during the regular class slot on **Tuesday, October 15**, and **Thursday, November 14**. The final exam will be given **Thursday, December 12**, at 2–5 PM. Note the final exam is three hours in length. The course grade will be based on classroom and laboratory grades – 20% from the lab and 80% from the classroom.

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 at GFS 120, 740-0776.

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 solution sets/manuals.**

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 13

Midterm Exam 1 – Tuesday, October 15

Midterm Exam 2 – Thursday, November 14

Last day to withdraw with a mark of “W” – Friday, November 15

Last day of class – Thursday, December 5

Final Exam – Thursday, December 12, 2-5 PM

SCHEDULE

Week	Start date	Subject
1	8/27	Coulomb's Law, vector fields, electric field
2	9/3	electric field, integral and differential forms of Gauss's Law
3	9/10	electrostatic potential, conservative fields
4	9/17	conductors, Poisson's Equation and image charges, capacitors
5	9/24	capacitors, current, resistivity
6	10/1	single- and multi-loop circuits, Thévenin's Theorem
7	10/8	RC circuits, transient and steady-state currents
8	10/15	<ul style="list-style-type: none">• Midterm 1 - October 15 •• Fall Break - October 17 - 20 •
9	10/22	special relativity (SR) review, SR and the electromagnetic field, fields due to moving charges
10	10/29	Ampère's Law, Biot-Savart Law
11	11/5	integral and differential forms of Faraday's Law
12	11/12	inductance, magnetostatic energy, transformers
		<ul style="list-style-type: none">• Midterm 2 - November 14 •
13	11/19	AC current and circuits, complex voltage and impedance
14	11/26	Maxwell's Equations
		<ul style="list-style-type: none">• Thanksgiving Break - November 27 - December 1 •
15	12/3	properties of electromagnetic waves
		<ul style="list-style-type: none">• Final Exam - December 12 •