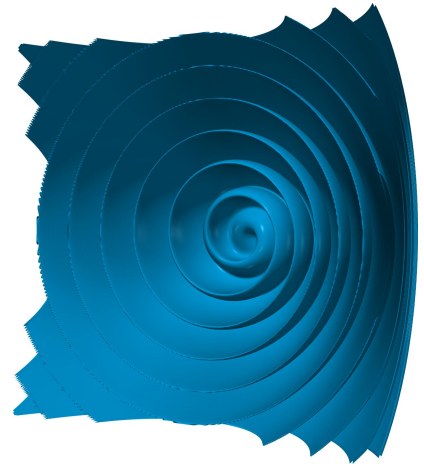


SYLLABUS
Physics 110B: Electricity and Magnetism
Winter 2022



Instructor	Brian Naranjo (naranjo@physics.ucla.edu)
Instructor's office hours	M11AM-12PM, W9-10AM, or by appt., Knudsen 3-168
TA	Stephen Ebert (stephenebert@ucla.edu)
TA's office hours	Thursday 1-2PM, Physics and Astronomy Building 1-339
Lectures	MWF 10-10:50AM, Physics and Astronomy Building 1434A
Discussion	Thursday 2-2:50PM, PAB 1434A
Final	Thursday, March 17, 8-11AM, PAB 1434A
Course administrator	Mary Tran (mtran@physics.ucla.edu)
Required textbook	Griffiths, <i>Introduction to Electrodynamics</i> (4th ed., 2017)
Helpful textbooks	Wangsness, <i>Electromagnetic Fields</i> (2nd ed., 1986) Jackson, <i>Classical Electrodynamics</i> (3rd ed., 1999) Zangwill, <i>Modern Electrodynamics</i> (1st ed., 2012) Purcell and Morin, <i>Electricity and Magnetism</i> (3rd ed., 2013)
Requisites	Physics 110A is a prerequisite, and Physics 105B is a corequisite
Topics	Maxwell's equations, electromagnetic waves, potentials and fields, radiation, and relativistic electrodynamics

¹The figure above shows electromagnetic energy radiating away from a relativistic electron traveling along a helical path in a uniform magnetic field. Source code available at <https://github.com/ucla-pbpl/pbpl-radiation>.

Grading scheme

- Grades are weighted according to:

Homework (6 problem sets)	20%
First midterm (Friday, Feb. 11)	20%
Second midterm (Wednesday, Mar. 2)	20%
Final (Thursday, March 17)	40%

- All homework and exams are scored on the following ten-point scale:²

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
[10,9.5]	(9.5,9]	(9,8.5]	(8.5,8]	(8,7.5]	(7.5,7]	(7,6.5]	(6.5,6]	(6,5.5]	(5.5,5]	(5,4.5]	(4.5,4]	< 4

- Your course letter grade is determined using the same ten-point scale, with no rounding.
- Your overall homework score is the average of the six problem sets. Homework is not curved.
- Each of the three exams is curved separately. As a rough guideline, typically 30% of the exams will be in the A range, 30% will be in the B range, 30% will be in the C range, and the remaining 10% will be Ds and Fs.

Homework policy

- Discussing homework with classmates is encouraged.
- Using Mathematica, Maple, SymPy, etc. to check algebra is fine and a good skill.
- Using L^AT_EX is encouraged. Making an excellent write-up (good diagrams, good verbal description, concise, insightful, etc.) will help solidify your understanding.
- No matter what assistance or guidance (e.g., from the instructor, the TA, a classmate, a solution manual, other textbooks, etc.) that you received in your understanding of a problem, your actual write-up must be your own work. If you can't write your solution on a blank sheet of paper without using references, then you are ready for neither your write-up nor your exam.
- No late homework will be accepted without an extension granted *prior* to the due date.

Other notes

- Lecture attendance is encouraged, but not mandatory. All lectures are recorded and simulcast via Zoom and made available on Canvas.
- In addition to office hours, I am happy to schedule one-on-one Zoom meetings. Please contact me ASAP if you are struggling in this class.

²This somewhat relaxed scale minimizes the impact of a few low scores [Webb, Paul, and Chessey, Relative impacts of different grade scales on student success in introductory physics, *Phys. Rev. Phys. Educ. Res.* **16**, 020114 (2020)]

Tentative schedule

Week	Monday	Wednesday	Friday
1	Jan. 3 L01 (7.1.1)	Jan. 5 L02 (7.1.2, 7.1.3)	Jan. 7 L03 (7.2.1, 7.2.2)
2	Jan. 10 L04 (7.2.3, 7.2.4)	Jan. 12 L05 (7.3.1, 7.3.2, 7.3.3)	Jan. 14 L06 (7.3.5, 7.3.6)
3	Jan. 17 Holiday	Jan. 19 L07 (8.1.1, 8.1.2)	Jan. 21 L08 (8.2.1, 8.2.2, 8.2.3)
4	Jan. 24 L09 (8.2.4)	Jan. 26 L10 (9.1.1 - 9.1.4)	Jan. 28 L11 (9.2.1, 9.2.2)
5	Jan. 31 L12 (9.2.3, 9.3.1)	Feb. 2 L13 (9.3.2, 9.3.3)	Feb. 4 L14 (9.4.1, 9.4.2)
6	Feb. 7 L15 (9.4.3, 9.5.1)	Feb. 9 L16 (9.5.2, 9.5.3)	Feb. 11 MT1
7	Feb. 14 L17 (10.1.1 - 10.1.3, 10.2.1)	Feb. 16 L18 (10.2.2, 10.3.1)	Feb. 18 L19 (10.3.2)
8	Feb. 21 Holiday	Feb. 23 L20 (11.1)	Feb. 25 L21 (11.2)
9	Feb. 28 L22 (11.3)	Mar. 2 MT2	Mar. 4 L23 (11.4)
10	Mar. 7 L24 (12.1)	Mar. 9 L25 (12.2)	Mar. 11 L26 (12.3)

- **PS1** (Ch. 7) due Tuesday, Jan. 11 at 11:59PM
- **PS2** (Ch. 7) due Tuesday, Jan. 21 at 11:59PM
- **PS3** (Ch. 8) due Saturday, Feb. 5 at 11:59PM
- **MT1** (Chs. 7-8) on Friday, Feb. 11, 10-11AM, PAB 1434A
- **PS4** (Ch. 9) due Tuesday, Feb. 22 at 11:59PM
- **PS5** (Ch. 10) due Monday, Feb. 28 at 11:59PM
- **MT2** (Chs. 9-10) on Wednesday, Mar. 2, 10-11AM, PAB 1434A
- **PS6** (Ch. 11) due Wednesday, Mar. 9 at 11:59PM
- **Final** (Chs. 7-11) on Thursday, Mar. 17, 8-11AM, Location TBA
- Please read the corresponding sections of Griffiths *before* each lecture.

Covid-19 policy

Ensuring a safer campus depends on each of us following the latest UCLA health and safety guidelines. While campus policies must be modified to address changing local, state, and national orders and guidance, the most current information is available at covid-19.ucla.edu. At present, each of us:

- Is responsible, regardless of vaccination status, for wearing an approved mask that fully covers our nose and mouth for the duration of class, office hours, or other course-related activity.
 - Disposable masks are available at the Wooden Center. Your TA and I will bring a box of masks to class, discussion section, and office hours.
 - Appropriate masks include two-ply woven fabric masks, surgical masks, non-woven KN95 masks, and N95 respirators.
 - Please note that scarves, balaclavas/ski masks, single-layer fabric masks and neck gaiters, bandanas, and turtleneck collars are not compliant.
 - For those that have a disability-related reason not to wear a mask, you can contact the Center for Accessible Education (CAE) to obtain an approved accommodation and any appropriate alternative mitigation measures to be sent to instructors.
- Must be fully vaccinated or have submitted an exception request. Per the COVID-19 Response and Recovery Task Force, unvaccinated students with pending or approved exceptions must comply with twice-weekly testing.
- Is required to complete daily symptom checks prior to coming to campus, regardless of vaccination status, and must stay home if you are not cleared by the symptom survey and/or are advised by the Exposure Management Team to quarantine or isolate.
- Will refrain from eating meals in the classroom, except for those with approved accommodations. If you need to eat or drink something for medical reasons, please do so quickly and then put on your mask.

Be advised that refusal to comply with current campus directives related to COVID-19 mitigation may result in dismissal from the classroom, referral to the Office of Student Conduct, and/or cancellation of lecture, discussion section, or office hours.