

PHY 4324—Electromagnetism 2—Spring 2021
Course Syllabus

This course is the second semester of electricity and magnetism at the undergraduate physics level. Time enters the theory of electromagnetic fields and we arrive at Maxwell's equations—the complete classical theory of electromagnetism. The arrival happens pretty early in the term, and the bulk of our work will be to study electromagnetic waves and radiation.

Details

Course number:	PHY 4324
Class number:	17911
Credits:	3
Time & Place:	MWF 5 th period (11:45–12:35)
Class Zoom:	https://uf1.zoom.us/j/664395112
Final exam time:	At 3:00–5:00, Tuesday, April 27
Web site:	http://www.phys.ufl.edu/~tanner/Phy4324.html
Instructor:	David Tanner
Office & phone	2372 NPB — 392-4718
Email:	tanner@phys.ufl.edu
Office hours:	Tuesdays 3:00 PM and Wednesdays 12:50 PM
Office-hour Zoom:	https://uf1.zoom.us/j/664395112
Grader:	Moaz Elwan

Course Learning Goals

At the end of the semester, you will know that electromagnetism is governed by the four Maxwell equations plus the Lorentz force law. You will be familiar with energy and momentum of the electromagnetic fields. You will understand electromagnetic waves in the vacuum and in matter and how these derive from Maxwell's equations. You will be familiar with the physics that governs optical effects in matter. You will learn about the potential and fields from time-dependent currents and from charges in motion.

Textbook and other reading

The text is the book by Griffiths: *Introduction to Electrodynamics*, (Fourth Edition). We will attempt to cover Chapters 7–11. See the web page for a detailed schedule.

Another useful text is *Classical Electromagnetic Radiation*, Jerry B. Marion (1965) There is a revised 3rd edition by Mark A. Heald and Jerry B. Marion. This book is at the same level (more or less) as Griffiths. I'll use it occasionally for lecture material. It appears that can be downloaded as a pdf. Cheap used copies are available.

For a book about electromagnetic waves and optics, you cannot do better than the book *Optics* by Miles Klein, updated as a second edition by Klein and Thomas Furtak. And, reading Feynman's lectures is always valuable.

If you want to look at graduate-level texts, try *Classical Electrodynamics*, John D. Jackson (3rd edition 1999). This is the standard graduate text. Also *The Classical Theory of*

Fields, Lev Landau and Evgeny Lifshitz (1951 and later; the 4th edition is revised substantially) and *Electrodynamics of Continuous Media*, Lev Landau, Evgeny Lifshitz, and L.P. Pitaevskii (1960 and later). These books are at the high graduate level but are very readable. You need both to cover all of E&M.

Methods by which students will be evaluated and their grade determined

There will be three in-class exams (100 points each). The lowest grade on the three will be dropped and the other two will *each* make up 20% of your grade. The exam dates are 2/8, 3/12, and 4/2.

The final (3:00 to 5:00 pm Tuesdy, April 27) will be worth 200 points and makes up 25%.

If all three exam scores are good, one of them can replace half of the final score.

There will be homework (35%). The lowest-scored homework set will be dropped. The homework due dates are 1/22, 2/3, 2/15, 3/1, 3/10, 3/29, 4/12, and 4/21.

Current UF grading policies may be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/#gradestext>.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>. Attendance will not be monitored; however, exam questions will mostly come from topics discussed in class.

Class delivery

The class will be delivered on Zoom. I'll write on a tablet what in normal times would be written to the blackboard.

Our class sessions will be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate verbally are agreeing to have their voices recorded.

If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared.

Unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Recordings of the streaming video from the fall of 2020 are available. See the <https://mediasite.video.ufl.edu/Mediasite/Catalog/catalogs/phy4324-electricity-and-magnetism-ii> website. See schedule from fall <http://www.phys.ufl.edu/~tanner/2020skd-em.pdf> for the schedule from fall.

Other information

Students with disabilities requesting accommodations should first register with the Disability Resource Center (<https://disability.ufl.edu/>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code.” On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor.

Contact information for the Counseling and Wellness Center: <https://counseling.ufl.edu/>, 392-1575.