

Physics 3100 - Section 01

Electrodynamics Fall Semester 2023

- Room/Time:* **Lectures: MW 1:45 - 3:25pm, Seaver 109** (in person).
- Instructor:* Dr. Gabriele Varieschi
Office: Seaver Hall - 110
Phone: (310) 338-7632 (can leave a message)
E-mail: gvarieschi@lmu.edu (I will reply by the next day)
Office hours: TR 5:00 - 6:00pm, (Zoom office hours – <https://lmu.zoom.us/my/gvarieschi.fall2023>)
Other times available by appointment.
- Course Webpage:* <https://brightspace.lmu.edu/d2l/home/222768> (for all course materials)
Personal Webpage: <http://gvarieschi.lmu.build>
- COVID-19 info:** According to the [latest LMU guidelines](#), **masks are recommended, but not required.**
Please visit: <https://www.lmu.edu/together/resources/matrix/> for additional information regarding LMU policies.
- Required Text:* **David J. Griffiths – Introduction to Electrodynamics – Fourth Edition – Cambridge University Press (or Prentice Hall). ISBN-13: 978-1108420419 ISBN-10: 1108420419** ([free pdf book will be posted in Brightspace](#)).
We will try to cover chapters 1-7 of this book.
- Other useful books:* (not required)
Your old PHYS 201 textbook (for an elementary introduction to electromagnetism).
Reitz, Milford & Christy – Foundations of Electromagnetic Theory – Addison Wesley (another popular undergraduate text).
John D. Jackson – Classical Electrodynamics – Wiley (a leading graduate level textbook).
- Objectives and Topics:* We will cover several chapters of the textbook in the following order:
Part I – Vector analysis: review of vector algebra, differential and integral calculus with vectors, systems of coordinates, Dirac delta function.
Part II – The electric field: electrostatics, electric potential, work and energy, conductors, Laplace’s equation and other advanced methods, polarization and electric field in matter.
Part III – Magnetostatics in vacuum: magnetic field and forces, Biot-Savart law, Ampere’s law and magnetic potential.
Part IV – Magnetic fields in matter. Magnetization and linear media. Electrodynamics: electromotive forces, electromagnetic induction, Faraday’s law. Maxwell’s equations.
- Prerequisite: PHYS 2100, PHYS 2600; MATH 356, or concurrent enrollment.**
- Learning Outcomes:* Understand the foundations of classical electromagnetism from a more advanced point of view. Conceptually understand the theoretical framework of electromagnetic fields and related Maxwell equations. Be able to solve problems of increasing complexity, dealing with the applications of electromagnetism.
- Tests:* There will be three tests during the semester. They will all count toward your final grade, so please try not to miss any of them.
- Test Dates:* TBA
- Final Exam:* **Monday, December 11, 2pm**
The final exam is cumulative and equivalent to 2 tests.

Homework: Homework assignments will be given, typically one or two for each chapter of the book. Problem sets will be not be graded, but students will present their solutions in class for credit.

Grading:

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| Class Attendance & Participation | 10 % |
| Homework Presentation | 15 % |
| Test 1 | 15 % |
| Test 2 | 15 % |
| Test 3 | 15 % |
| Final Exam | 30 % |

Course Grading: **0-50%=F; 50-55%=D; 55-60%=C-; 60-65%=C; 65-70%=C+; 70-75%=B-; 75-80%=B; 80-85%=B+; 85-90%=A-; 90-100%=A.**

Academic Honesty: **Academic dishonesty** will be treated as an extremely serious matter with severe consequences that can range from receiving no credit for assignments/tests, failing the class, to expulsion. It is never permissible to turn in any work that has not been authored by the student, such as work that has been copied from another student or copied from a source (including Internet) without properly acknowledging the source. It is your responsibility to make sure that your work meets the standard set forth in the “[Academic Honesty Policy](#)”.

Special Accommodations: Students with special needs who require reasonable modifications, special assistance, or accommodations in this course should promptly direct their request to the Disability Support Services (DSS) Office. Any student who currently has a documented disability (ADHD, Autism Spectrum Disorder, Learning, Physical, or Psychiatric) needing academic accommodations should contact the DSS Office (Daum Hall 2nd floor, 310-338-4216) as early in the semester as possible. All discussions will remain confidential. Please visit <http://www.lmu.edu/dss> for additional information.

Syllabus changes: If necessary, this syllabus and its contents are subject to revision; students are responsible for any changes or modifications announced in class.

Have a nice semester. Good luck!