
PHY 6346

Electromagnetic Theory I

Fall 2017
MWF 3:00 p.m.-3:50 p.m. NPB 1101
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Office hours: Thursday, P4 and P5

All materials for this class will be posted at [UF e-learning](#) . Enter with your Gatorlink login and password.

Overview

PHY 6346 is the first semester of the graduate core sequence in Electromagnetism. The objectives of the course are (i) to study electrodynamics at a theoretically sophisticated level; (ii) to develop mathematical techniques useful for solving problems in E&M as well as other areas of physics; (iii) to develop problem solving skills; (iv) to prepare the student (if necessary) for the preliminary exam. Topics to be covered include

- Electrostatics: Coulomb's Law, the electric field, Gauss's Law, scalar potential, Poisson's equation, Green's functions
- Methods: images, separation of variables, harmonic functions
- Multipoles, polarization, displacement, linear dielectrics
- Magnetostatics: Biot-Savart Law, the magnetic field, Ampère's Law, vector potential, magnetization, magnetic materials
- Time-varying magnetic field: Faraday's Law, induction, Ohm's law, skin depth

Coursework

Weekly homework (50% of the grade), due every Friday by 5 p.m.

Midterm (20%)

Final exam (30%)

“Units rule”

Every algebraic solution of homework and exam problems must be accompanied by a unit check. Without such a check, no more than 75% of the credit will be given even for an otherwise perfectly correct solution. On the other hand, constructing an answer using dimensional analysis and other general arguments (symmetries, limiting cases, etc.) may earn you up to 50% of the credit, even if a formal solution is not provided.

Disclaimer

University Policies: Students are expected to know and comply with the University's policies regarding academic honesty and use of copyrighted materials. Cheating, plagiarism, or other violations of the Academic Honesty Guidelines will not be tolerated and will be pursued through the University's adjudication procedures.

Students requesting classroom accommodations must first register with the Disabilities Resources Program, located in the Dean of Students Office, P202 Peabody Hall. The Disabilities Resources Program will provide documentation to the student, who must then deliver this documentation to the instructor when requesting accommodations.

Materials

- Main text:
J. D. Jackson, Classical Electrodynamics, 3rd ed.
- Supplemental texts:
 - A. Zangwill, Modern Electrodynamics.
L. D. Landau and E. M. Lifshitz, Electrodynamics of Continuous Media (Landau Course of Theoretical Physics, v.8).

Important dates

No classes: Sept 4 (Labor Day), Oct 6 (Homecoming), Nov 10 (Veteran's Day),

Nov 22-24 (Thanksgiving)

Midterm

Wed, Oct 18, during the class time

Final exam

Officially scheduled for Fri, Dec 15
7:30 a.m.-9:30 a.m.

