

Physics 3202 - Electricity and Magnetism II

Spring Semester 2023

Lectures: Room GS 119

Tuesday and Thursday, 2:00pm—3:15pm

Textbook: David J. Griffiths, *Introduction to Electrodynamics*, fourth edition

Class Webpage:

https://www.phys.uconn.edu/~kharchenko/Courses/P3202_23S/

Information on the class, Lecture Notes, lecture Outlines, Syllabus, Homework assignments, Examples of problems and their solutions can be found on this class webpage.

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Office Hours: Thursday 6:30 pm - 7:30pm on the UConn Webex

Communications: e-mail: vasili.kharchenko@uconn.edu

Personal WebEx and “in person” meetings by appointments.
Appointments can be arranged via e-mail at convenient time.

Homework: Weekly homework assignments, posted on the class webpage
Submission details will be discussed on lectures.

Course Evaluation:

- This course includes the Midterm Exam and Final Exam
- The course grade will be calculated considering all assessments:

Homework	-	30%
Midterm	-	30%
Final Examination	-	40%

Course Outlines:

- Time-dependent electric and magnetic fields
- Electromotive force, electromagnetic induction, and Faraday's Law
- Inductance and energy of magnetic field
- Maxwell's equations for time-dependent EM field
- Energy and momentum of EM field, Poynting's theorem
- Solutions of the wave equation for EM waves
- Electromagnetic waves in vacuum, wave polarization
- Electromagnetic waves in matter, dispersion
- Wave equations for the scalar and vector potentials
- Gauge invariance
- Retarded potentials
- Radiation of EM waves, multipole and dipole radiation
- Electrodynamics and relativity, the special theory of relativity
- Lorentz transformations
- Proper coordinate frame
- Relativistic mechanics: the energy, momentum, and angular momentum
- Relativistic electrodynamics