PH206 January 3:0

Electromagnetic Theory

Instructor

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Teaching Assistant

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Department: Physics

Course Time: Tue., Thu., 11:30 - 1:00 PM

Lecture venue: Physics Seminar Hall

Detailed Course Page:

Announcements

Brief description of the course

Electromagnetic theory for UG student and Integrated Ph.D. students

Prerequisites

NONE

Syllabus

Laws of electrostatics and methods of solving boundary value problems. Multi-pole expansion of electrostatic potentials, spherical harmonics. Electrostatics in material media, dielectrics. BiotSavart Law, magnetic field and the vector potential. Faradayâ€™s Law and time varying fields. Maxwellâ€™s equations, energy and momentum of the electromagnetic field, Poynting vector, conservation laws. Propagation of plane electromagnetic waves. Radiation from an accelerated charge, retarded and advanced potentials, Lienard-Wiechert potentials, radiation multi-poles. Special theory of relativity and its application in electromagnetic theory. Maxwellâ€™s equations in covariant form: four â€“ potentials, electromagnetic field tensor, field Lagrangian. Elements of classical field theory, gauge invariance in electromagnetic theory.

Course outcomes

UG+Integrated Ph.D.

Grading policy

Midterm+Final

Assignments

Resources