COURSE DETAIL

FOUNDATIONS OF ELECTROMAGNETISM
Country United Kingdom - Scotland
Host Institution University of Edinburgh
Program(s) University of Edinburgh
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Physics
UCEAP Course Number 124
UCEAP Course Suffix
UCEAP Official Title FOUNDATIONS OF ELECTROMAGNETISM
UCEAP Transcript Title ELECTROMAGNETISM
UCEAP Quarter Units 4.00
UCEAP Semester Units 2.70

Course Description

This is a one-semester course, covering time-independent and time-dependent properties of electric and magnetic fields leading to the vector calculus formulation of Maxwell's Equations and the derivation of electro-magnetic waves in vacuo and in media. On completion of this course, the student is able to: state the integral laws of electromagnetism and state and derive Maxwell's equations; formulate and solve with vector calculus problems of static and time-varying electrical and magnetic field including utilization of the electric scalar potential and the magnetic vector potential; derive and apply the concepts of: Maxwell's displacement current, the continuity equation, self- and mutual inductance, Poynting's vector, energy flux, and radiation pressure; define and explain: polarization and magnetization, the fields D, H, E and B, the relation between E, B and the force on a particle, polarization charges and magnetization currents, boundary conditions on fields at interfaces between media, and Maxwell's equations in media.

Language(s) of Instruction
English

Host Institution Course Number
PHYS09050

Host Institution Course Title
FOUNDATIONS OF ELECTROMAGNETISM

Host Institution Campus
Edinburgh

Host Institution Faculty

Host Institution Degree

Host Institution Department
Physics and Astronomy

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