

# 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 electromagnetic 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 Course Details

<https://www.ed.ac.uk/global/study-abroad/course/index.php?submitted=yes&showadv...>

### Host Institution Campus

Edinburgh

### Host Institution Faculty

### Host Institution Degree

**Host Institution Department**

Physics and Astronomy

**Course Last Reviewed**

2022-2023

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