

Electromagnetism (Junior Honours) 2013/14

S1 (Foundations) Lecturer: Martin Evans (JCMB 2615)

21 Lectures: Tuesday, Friday 10:00-10:50 in Lecture Theatre B

Tutorial Workshops: N.B. Workshops begin this week

Wednesday 11:10-13:00 Weeks 1-11 JCMB 5326/5327

Friday 11:10-13:00 Weeks 1,3,5,7,9,11 5327

There will be four assessed hand-ins Week 3, Friday 4th October; Week 5, Friday 18th October; Week 8, Friday 8th November; Week 10, Friday 22nd November

Office Hours TBC: Tuesday 16:00-18:00

S1 Synopsis

A review of the static and dynamic properties of electric and magnetic fields, leading to the formulation of Maxwell's Equations which describe the classical laws of electromagnetism. These laws are used to derive properties associated with electromagnetic waves. The effects of dielectric and magnetic materials are discussed.

Reference Books

W.J. Duffin, *Electricity & Magnetism*, 4th Ed. (Mcgraw-Hill),
ISBN 0-07-707209

Good textbook generally recommended for most of the course - unfortunately out of print

D. Fleisch, *A student's Guide to Maxwell's Equations*, CUP ISBN-10: 0521701473 £15
Very clear but restricted to the core of the course only. + Podcasts available to all at
<http://www4.wittenberg.edu/maxwell/bio.html>

I.S.Grant & W.R. Phillips, *Electromagnetism*, 2nd Ed. (Wiley),
ISBN 0-471-92711-2 £25

Also at the level of this course, some explanations are confusing but book is fairly priced

D.J. Griffiths, *Introduction to Electrodynamics*, 3rd Ed. (Prentice-Hall),
ISBN 0-13-919960-8 ~ £60

Preferred book for the course, everything thoroughly and clearly explained ... but a little expensive. Also covers some more advanced topics relevant to P4/5

J.D.Jackson, *Classical Electrodynamics*, 3rd Ed. (Wiley)
ISBN 0-471-30932-X ~£80

A legendary textbook - definitive with all the calculations but well beyond the level of this

course

S1Syllabus

The Semester 1 material roughly divides into four Chapters:

I Electrostatics

II Magnetism

III Maxwell's Equations and Electrodynamics

IV EM waves in Materials

MRE, September 7, 2013