

Course Title: Electromagnetism
Course Lecturer: Dr Gary Tupper (gary.b.tupper@gmail.com)
Course credits: 1
Lecturer contact hours: 24
Tutorial/practical hours: 6

1) Course overview:

A complete, self-contained course on electromagnetism. Material is aimed to be accessible to someone with first year physics background. Emphasis will be on aspects having relevance in astronomy/astrophysics.

2) Course breakdown/syllabus:

Tools of vector field calculus; Electrostatics; Magneto-statics; Electrodynamics; Energy & Momentum; Electromagnetic waves (vacuum); Sources & fields in electrodynamics; Electromagnetic radiation; Radiative processes; Antennas; Relativity and electrodynamics Effects of matter; Electromagnetic waves in matter; Refraction; Frequency dependence; Electromagnetic waves in plasmas; MHD primer.

3) Resources:

PDFs of the lecture slides will be available. Reference texts are: D. J. Griffiths, *Introduction to Electrodynamics*; G. L. Pollack & D. R. Stump, *Electromagnetism*.

4) Breakdown of practicals/tutorials:

Problem solving in electromagnetism

5) Class tutor

Sal Ahmad (AHMSAL001@myuct.ac.za)

6) Additional skills to be developed during the course:

Numerical problem solving/plotting

7) Assessment¹

6 tutorials: 25%

Class test: 25%

Final exam: 50%

¹ Note: use of AI is strictly prohibited and will be deemed plagiarism