



Course

Electromagnetic Engineering

ELEC3115 | 6 Units of Credit

Overview

Review of vector calculus, Electric Fields: Coulomb's and Gauss's laws and Maxwell's equations, Electric potential, Laplace's and Poisson's equations; Magnetic Fields: Biot-Savart law, Vector potential and Ampere's law and Maxwell's equations; Application of Gauss's law; Solution of Poisson's and Laplace's equations for electric field; Boundary value problems and method of images; Dielectric materials, capacitance, electrostatic energy and forces, losses; Field and current density, conductance; Application of Ampere's law; Magnetic materials, inductance, coupling in magnetic circuits; Magnetic energy and forces. Application of Faraday's law, transformers; Skin effect and skin depth, hysteresis and eddy current losses. Electromagnetic spectrum. Time-varying fields and Maxwell's equations: forms, boundary conditions. Plane electromagnetic waves in lossless/lossy media: polarization, group velocity dispersion, energy flows, Poynting vector, reflection/refraction at boundary. Transmission lines: wave characteristics, impedance and matching. Waveguides: modal analysis of rectangular metallic waveguides. Antennas: antenna patterns and parameters, linear dipole, antenna array.

Faculty

Faculty of Engineering

School

School of Electrical Engineering & Telecommunications

Study Level

Undergraduate

Offering Terms

Term 1

Campus

Kensington

Delivery Mode

Fully on-site

Indicative contact hours

7

Timetable

[Visit timetable website for details](#)

Conditions for Enrolment

Pre-requisite: MATH2069 AND (PHY1231 OR DPST1024)

Equivalent Courses

ELEC2015 3 UOC

Electromagnetic Applications

Course Outline

To access course outline, please visit:

[ELEC3115 Course Outline](#)

Fees

Commonwealth Supported Students \$1191

Domestic Students \$5970

International Students \$5970

DISCLAIMER

Please note that the University reserves the right to vary student fees in line with relevant legislation. This fee information is provided as a guide and more specific information about fees, including fee policy, can be found on the [fee website](#).

For advice about fees for courses with a fee displayed as "Not Applicable", including some Work Experience and UNSW Canberra at ADFA courses, please contact the relevant Faculty.

Where a Commonwealth Supported Students fee is displayed, it does not guarantee such places are available.

Pre-2019 Handbook Editions

Access past handbook editions (2018 and prior)

[Pre-2019 Handbook Editions](#)

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Authorised by Deputy Vice-Chancellor (Academic)

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