640-383 Electrodynamics

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: Three 1-hour lectures per week. These include 6 tutorial classes. Total 36 hours. Total Time Commitment: 120 hours total time commitment.
Prerequisites:	One of # 640-225 (prior to 2009) # 640-245 (prior to 2009) Plus one of # *Vector Calculus* (620-231 Vector Analysis prior to 2009) # 620-233 (prior to 2009) Plus one of # *Mathematical Methods* # 620-234 (prior to 2009)
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	640-323 (prior to 2009), 640-343 (prior to 2009)
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Assoc Prof Ann Roberts
Subject Overview:	This subject provides an introduction to electrodynamics and looks at a wide range of applications including optical fibres, superconductors, plasmas and astrophysics. Electrodynamics in vacuo is described in terms of both fields and potentials; relativistic covariance; electrodynamics in material media: dielectric, magnetic, conducting; calculation of fields, boundary value problems: motion of particles in electromagnetic fields; production, propagation, and interaction of electromagnetic waves; radiation from accelerated charges; and Lagrangian and Hamiltonian formulation of particle motion in a field and of the field itself.
Objectives:	Students completing this subject should be able to: # explain classical electrodynamics based on Maxwell's equations including its formulation in covariant form; # solve problems involving the calculation of fields, the motion of charged particles and the production of electromagnetic waves; and # analyse the solution of these problems in the context of a range of applications.
Assessment:	Tests totalling up to 2 hours and assignments totalling up to an equivalent of 3000 words during the semester (20%); a 3-hour written examination in the examination period (80%).
Prescribed Texts:	D J Griffiths, Introduction to Electrodynamics, 3rd edition, John Wiley
Recommended Texts:	J D Jackson, *Classical Electrodynamics*, 3rd edition, Academic Press.

Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2009/D09)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2009/F04)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2009/A04)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2009/M05)** You should visit **learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)** and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	A student who completes this subject should be able to: # explain their understanding of physics principles and applications lucidly, both in writing and orally; # participate as an effective member of a group in tutorial discussions; # think independently and analytically, and direct his or her own learning; # manage time effectively in order to be prepared for regular practical and tutorial classes, tests, the examination and to complete assignments
Notes:	Students enrolled in the BSc (pre-2008 BSc), BASc or a combined BSc course will receive science credit for the completion of this subject.