

## 640-323 Electrodynamics (Adv)

<b>Credit Points:</b>	12.500
<b>Level:</b>	Undergraduate
<b>Dates &amp; Locations:</b>	2008, This subject commences in the following study period/s: Semester 2, - Taught on campus.
<b>Time Commitment:</b>	Contact Hours: 30 lectures, six 1-hour tutorials and up to six additional contact hours Total Time Commitment: 120 hours.
<b>Prerequisites:</b>	Physics 640-225 or 640-245. Mathematics 620-231 or 620-233; and mathematics 620-232 or 620-234.
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	None
<b>Core Participation Requirements:</b>	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.
<b>Coordinator:</b>	Dr A Melatos
<b>Subject Overview:</b>	<p>This subject provides an introduction to electrodynamics and looks at a wide range of applications including optical fibres, superconductors, plasmas and astrophysics.</p> <p>Students completing this subject will be able to:</p> <ul style="list-style-type: none"> <li># explain classical electrodynamics based on Maxwell's equations including its formulation in covariant form;</li> <li># solve problems involving the calculation of fields, the motion of charged particles and the production of electromagnetic waves; and</li> <li># analyse the solution of these problems in the context of a range of applications.</li> </ul> <p>In addition, students will enhance their ability to:</p> <ul style="list-style-type: none"> <li># participate effectively as part of a group in tutorials; and</li> <li># plan effective work schedules and manage their time to meet the deadlines for submission of assessable work and prepare for tests and examinations.</li> </ul> <p>The subject provides an introduction to electrodynamics in vacuo: 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.</p>
<b>Assessment:</b>	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%).
<b>Prescribed Texts:</b>	Classical Electrodynamics (J D Jackson), 3rd edn, Wiley
<b>Breadth Options:</b>	This subject is a level 2 or level 3 subject and is not available to new generation degree students as a breadth option in 2008. This subject or an equivalent will be available as breadth in the future.

	Breadth subjects are currently being developed and these existing subject details can be used as guide to the type of options that might be available. 2009 subjects to be offered as breadth will be finalised before re-enrolment for 2009 starts in early October.
<b>Fees Information:</b>	Subject EFTSL, Level, Discipline & Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a>
<b>Notes:</b>	This subject is available for science credit to students enrolled in the BSc (pre-2008 degree only), BAsc or a combined BSc course.