

## ELEN30005 Fields and Transmission Lines

<b>Credit Points:</b>	12.50
<b>Level:</b>	3 (Undergraduate)
<b>Dates &amp; Locations:</b>	2010, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
<b>Time Commitment:</b>	Contact Hours: Twenty-four hours of lectures, 12 hours of tutorials. Total Time Commitment: 120 hours
<b>Prerequisites:</b>	431-201 Engineering Analysis A (prior to 2001, 421-204 Engineering Analysis A) or equivalent, 431-202 Engineering Analysis B (prior to 2001, 421-205 Engineering Analysis B) or equivalent and 640-142 Physics 1B or equivalent.
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	None
<b>Core Participation Requirements:</b>	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: <a href="http://www.services.unimelb.edu.au/disability/">http://www.services.unimelb.edu.au/disability/</a>
<b>Coordinator:</b>	Assoc Prof Michael Cantoni
<b>Contact:</b>	Melbourne School of Engineering Office Building 173, Grattan Street The University of Melbourne VIC 3010 Australia General telephone enquiries + 61 3 8344 6703 + 61 3 8344 6507 Facsimiles + 61 3 9349 2182 + 61 3 8344 7707 Email <a href="mailto:eng-info@unimelb.edu.au">eng-info@unimelb.edu.au</a> ( <a href="mailto:eng-info@unimelb.edu.au">mailto:eng-info@unimelb.edu.au</a> ) ( <a href="http://eng-unimelb.custhelp.com/">http://eng-unimelb.custhelp.com/</a> )
<b>Subject Overview:</b>	On completion of this subject, students will be able to analyse and compute static and time varying EM fields, and design a variety of electrical transmission line networks in the frequency domain using a combination of distributed and lumped circuit elements.  Topics include: static electric and magnetic fields in free and material space; time-varying electromagnetic (EM) fields; Maxwell's equations; plane wave propagation of EM fields; transmission lines; transmission line parameters and characteristics; introduction to distributed circuits; matching techniques; Smith Chart; scattering parameters; introduction to microstrip and stripline; introduction to waveguides and antennas.
<b>Objectives:</b>	On completing this subject the student should be able to: <ul style="list-style-type: none"> <li># Model electromagnetic fields for static and time-varying cases from the underlying physical principles;</li> <li># Apply techniques for the analysis and design electrical transmission line networks;</li> <li># Use software tools to simulate electromagnetic fields.</li> </ul>

<b>Assessment:</b>	One 3-hour end of semester examination (70%), Assignments (30%).
<b>Prescribed Texts:</b>	None
<b>Recommended Texts:</b>	Stuart M.Wentworth " Applied Electromagnetics -EARLY Transmission Lines, Approach", Wiley, 2007
<b>Breadth Options:</b>	This subject is not available as a breadth subject.
<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>Generic Skills:</b>	<p>On completion of this subject students should have developed the following generic skills:</p> <ul style="list-style-type: none"> <li># Ability to apply knowledge of basic science and engineering fundamentals</li> <li># In-depth technical competence in at least one engineering discipline</li> <li># Ability to undertake problem identification, formulation and solution</li> <li># Ability to utilise a systems approach to design and operational performance</li> <li># Capacity for independent critical thought, rational inquiry and self-directed learning</li> <li># Ability to communicate effectively, with the engineering team and with the community at large</li> </ul>
<b>Related Course(s):</b>	<p>Bachelor of Engineering (Computer Engineering)          Bachelor of Engineering (Computer Engineering)/Bachelor of Science          Bachelor of Engineering (Electrical Engineering)          Bachelor of Engineering (Electrical) and Bachelor of Arts          Bachelor of Engineering (Electrical) and Bachelor of Commerce          Bachelor of Engineering (Electrical) and Bachelor of Laws          Bachelor of Engineering (Electrical) and Bachelor of Science          Bachelor of Engineering (EngineeringManagement) Computer          Bachelor of Engineering (EngineeringManagement) Electrical          Bachelor of Engineering (IT) Computer Engineering          Bachelor of Engineering (IT) Electrical Engineering</p>