

# 431-103 Electrical Circuits 1

<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: Twenty-four hours of lectures, 24 hours of tutorials, 12 hours of laboratory work, web-based study Total Time Commitment: Not available
<b>Prerequisites:</b>	None
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	None
<b>Core Participation Requirements:</b>	<p>&lt;p&gt;For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry.&lt;/p&gt;         &lt;p&gt;It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: &lt;a href="http://services.unimelb.edu.au/disability"&gt;http://services.unimelb.edu.au/disability&lt;/a&gt;&lt;/p&gt;</p>
<b>Subject Overview:</b>	<p>Students will be introduced to the fundamentals of electrical and electronic engineering. At the completion of the subject students will develop skills in designing and analysing linear circuits comprising electrical and electronic components.</p> <p>Topics covered: fundamental electrical quantities (current, voltage, power); circuit elements (resistors, voltage and current sources); basic circuit laws (Ohm's law Kirchoff's laws, voltage and current division); analysis of passive networks (using node voltage analysis and superposition); Thevenin and Norton equivalent circuits; capacitors and inductors (characteristics and combination); transient response of first-order circuits (RC and RL); sinusoidal sources (phasor representation); AC impedance and admittance of capacitors and inductors; AC steady state characteristics and analysis of passive RLC networks; mutual inductance and the ideal transformer; basic introduction to the diode and its characteristics; load-line analysis of diode circuits; simple diode circuits (limiter); diode rectification; amplifier concepts (inverting, noninverting, voltage current and power gain); introduction to the ideal opamp and feedback; basic opamp circuits (inverting, non-inverting, follower, summing, integrators and differentiators)</p>
<b>Assessment:</b>	Tutorial attendance (5%) and 5 assignments (10% in total) of maximum total length 30 pages, due fortnightly through the semester; laboratory reports from 4 practical classes, (15% in total); and a 3-hour closed book written examination during the end-of-semester examination period (70%).
<b>Prescribed Texts:</b>	None
<b>Recommended Texts:</b>	Information Not Available
<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>	# ability to apply knowledge of basic science and engineering fundamentals

	<ul style="list-style-type: none"><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># understanding of the principles of sustainable design and development</li><li># understanding of professional and ethical responsibilities and commitment to them</li><li># expectation of the need to undertake lifelong learning, capacity to do so</li><li># capacity for independent critical thought, rational inquiry and self-directed learning</li></ul>
<b>Related Course(s):</b>	Bachelor of Engineering(Mechanical & Manufacturing) and Bachelor of Laws