

# ELEN90060 Power System Analysis

<b>Credit Points:</b>	12.50									
<b>Level:</b>	9 (Graduate/Postgraduate)									
<b>Dates &amp; Locations:</b>	2011, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.									
<b>Time Commitment:</b>	Contact Hours: 24 hours of lectures and 24 hours of workshops Total Time Commitment: Not available									
<b>Prerequisites:</b>	Prerequisites for this subjects are: <table border="1" data-bbox="387 600 1485 801"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>ELEN30009 Electrical Network Analysis and Design</td> <td>Semester 1</td> <td>12.50</td> </tr> <tr> <td>ELEN30011 Electrical Device Modelling</td> <td>Semester 2</td> <td>12.50</td> </tr> </tbody> </table>	Subject	Study Period Commencement:	Credit Points:	ELEN30009 Electrical Network Analysis and Design	Semester 1	12.50	ELEN30011 Electrical Device Modelling	Semester 2	12.50
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ELEN30009 Electrical Network Analysis and Design	Semester 1	12.50								
ELEN30011 Electrical Device Modelling	Semester 2	12.50								
<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>Contact:</b>	Assoc Prof Mohammad Aldeen Email: <a href="mailto:aldeen@unimelb.edu.au">aldeen@unimelb.edu.au</a> ( <a href="mailto:aldeen@unimelb.edu.au">aldeen@unimelb.edu.au</a> )									
<b>Subject Overview:</b>	<p>This subject provides an insight into the basic elements of electrical power distribution systems such as generators, transmission, distribution, and loads. It offers analytical tools for analysis of basic operations of these systems. Problems related to power flow from source to load, practical constrains and solutions will be discussed in detail. The following topics will be covered.</p> <ul style="list-style-type: none"> <li># Basic Fundamentals: AC vs DC power distribution, single-phase AC circuits, three-phase AC circuits, power and energy calculation, power transmission and capacity limits;</li> <li># Synchronous Generator: construction, equivalent circuit, real and reactive power control, loading capability,</li> <li># Unsymmetrical Fault Calculations: sequence representation of impedance, rotating machines, and transformers, power calculation under line to ground, double line and double line to ground faults;</li> <li># Load Flow: problem formulation, numerical solutions;</li> <li># Power System Stability: swing equation, steady state, transient, and voltage stability.</li> </ul>									
<b>Objectives:</b>	<p>On completing this subject the student should be able to</p> <ul style="list-style-type: none"> <li># Understand the behaviour of the basic components of power systems,</li> <li># Compute power flow in transmission systems,</li> <li># Compute fault quantities, such as voltage, current and power in transmission systems under normal and short-circuit fault conditions,</li> <li># Ascertain the stability of power systems from operating conditions,</li> </ul>									

	# Use software tools to simulate and study the steady-state and dynamic behaviour of electrical power systems.
<b>Assessment:</b>	One written examination not exceeding three hours at the end of semester, worth 50%. Individual or small team technical project and written report not exceeding 10 pages due in the week before mid-semester break worth 20%. Team-based technical project and written report not exceeding 30 pages due in the last week of semester, worth 30%.
<b>Prescribed Texts:</b>	TBA
<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>	<ul style="list-style-type: none"> <li># Ability to apply basic fundamentals of science and engineering to solve real life problems associated with power systems</li> <li># Ability for in-depth technical competence in at least power systems engineering discipline</li> <li># Ability to identify, formulate, analyse and solve practical engineering problems</li> <li># Capacity for independent critical thought, rational assessment and self-directed learning</li> <li># Ability to communicate and work effectively with teams</li> </ul>
<b>Related Course(s):</b>	Bachelor of Engineering (Computer Engineering) Bachelor of Engineering (Electrical Engineering) Bachelor of Engineering (Electrical) and Bachelor of Arts Bachelor of Engineering (EngineeringManagement) Electrical
<b>Related Majors/Minors/ Specialisations:</b>	B-ENG Electrical Engineering stream Master of Engineering (Electrical)