ELEN30011 Electrical Device Modelling

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2011, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 3 one hour lectures and 1 two hour workshop per week Total Time Commitment: 120 hours
Prerequisites:	Prerequisites for this subject are: **Subject** | **Study Period Commencement:** | **Credit Points:** ELEN20005 Foundations of Electrical Networks | January, Semester 2 | 12.50 Enrolment in Master of Engineering (Electrical or Mechatronics) OR **Subject** | **Study Period Commencement:** | **Credit Points:** PHYC10004 Physics 2: Physical Science & Technology | Semester 2 | 12.50
Corequisites:	None
Recommended Background Knowledge:	Knowledge of the following subject is recommended **Subject** | **Study Period Commencement:** | **Credit Points:** ELEN30009 Electrical Network Analysis and Design | Semester 1 | 12.50
Non Allowed Subjects:	Credit may not be obtained for both 431-328 Digital Systems3: Circuits and Systems and 431-303 Electrical Device Modelling **Subject** | **Study Period Commencement:** | **Credit Points:** 431-328 Digital Systems 3: Circuits and Systems | Not offered 2010 |
Core Participation Requirements:	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: http://www.services.unimelb.edu.au/disability/
Coordinator:	Dr Peter Dower
Contact:	Email: **pdower@unimelb.edu.au (mailto:pdower@unimelb.edu.au)**
Subject Overview:	This subject develops the theoretical and practical tools required to understand, construct, validate and apply models of standard electrical and electronic devices. In particular, students will study the theoretical and practical development of models for devices such as resistors, capacitors, inductors, transformers, motors, batteries, diodes, transistors, and transmission lines. In doing so, students will gain exposure to a variety of fundamental fields in physics, including electromagnetism, semiconductor materials and quantum electronics. This material will be complemented by exposure to experiment design and measurement techniques in the

	laboratory, the application of models from device manufacturers, and the use of electronic circuit simulation software.
Objectives:	On completing this subject the student should be able to: # Develop/interpret useful models for electrical and electronic devices from the underlying physics and/or empirical data; # Use modelling principles in engineering design with an appreciation for the impact of modelling uncertainty and model complexity; # Implement and analyse the results of laboratory experiments for gathering empirical data from electrical and electronic devices; # Use software tools to simulate the behaviour of electrical and electronic devices.
Assessment:	One written examination, not exceeding three hours at the end of semester, worth 60% (must pass written exam to pass subject); Continuous assessment of project work, not exceeding 30 pages in total over the semester, worth 30%; A one hour mid-semester test, worth 10%.
Prescribed Texts:	TBA
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/2011/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2011/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2011/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2011/B-MUS)** 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:	On completion of this subject students should have developed the following generic skills: # Ability to apply knowledge of basic science and engineering fundamentals # Ability to undertake problem identification, formulation and solution # Ability to utilise a systems approach to design and operational performance # Ability to communicate effectively, with the engineering team and with the community at large # Capacity for independent critical thought, rational inquiry and self-directed learning # Expectation of the need to undertake lifelong learning, capacity to do so
Related Course(s):	Bachelor of Engineering (Mechatronics) and Bachelor of Computer Science Bachelor of Science
Related Majors/Minors/ Specialisations:	B-ENG Electrical Engineering stream Electrical Systems Master of Engineering (Electrical) Master of Engineering (Mechatronics)