ELEN30013 Electronic System Implementation

Credit Points:	12.5
Level:	3 (Undergraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 2 one hour lectures and 1 three hour workshop per week Total Time Commitment: 170 hours
Prerequisites:	The prerequisite for this subject is

Subject	Study Period Commencement:	Credit Points:
ELEN20005 Foundations of Electrical Networks	January, Semester 2	12.50

Corequisites:	None
Recommended Background Knowledge:	Knowledge of the following subjects is recommended

Subject	Study Period Commencement:	Credit Points:
PHYC10004 Physics 2: Physical Science & Technology	Semester 2	12.50
ELEN30009 Electrical Network Analysis and Design	Semester 1	12.50
ELEN30010 Digital System Design	Semester 1	12.50
COMP20005 Engineering Computation	Semester 1, Semester 2	12.50

Non Allowed Subjects:	ELEN30006 (431-330) Design Laboratory
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:	Assoc Prof Peter Farrell
Contact:	Assoc Prof Peter Farrell Email: **farrell@unimelb.edu.au (mailto:farrell@unimelb.edu.au)**
Subject Overview:	**AIMS** This subject provides the foundation knowledge required to understand the operation, assembly and testing of various simple electronic systems that interact with the real world. The aim is to expose students to designing with a range of standard electrical and electronic devices, basic circuit construction methods and electrical measurement techniques to test and verify the function of electronic systems. This subject provides students with hands-on skills to gain basic competencies in design and implementation of simple circuits and those wishing to seek further electronic design experience are recommended to take subjects such as High Speed Electronics, Electronic System Design and Embedded System Design. This includes hands-on experience with:

	# Operation and selection of a range of most common electrical and electronic devices used in various electronic circuits # Common electronic circuit realisations to meet the most commonly required signal processing and conditioning applications # Programmable digital circuits and microprocessor programming # Circuit design and simulation tools # Printed circuit board layout, circuit assembly, and soldering techniques # Test and Measurement equipment and methods # Managing design issues and requirements. Students will complete electronic circuit implementation projects in small groups and be required to prepare technical documentation and present project outcomes. **INDICATIVE CONTENT** # Devices such as resistors, capacitors, inductors, switches, transducers, motors, diodes, transistors, op-amps, voltage regulators, comparators, oscillators, timers, A/D and D/A converters, microprocessors and controllers; # Circuit functions and techniques such as buffering, referencing, signal conditioning, filtering, bridges, detection, waveform generation, and pulse-width modulation; # Microprocessor programming, the role of assembly and high-level languages, assemblers, compilers and debuggers; # PCB layout, circuit assembly, and soldering techniques; # Test and Measurement methods and working with common equipment such as multimeters and oscilloscopes.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** Having completed this subject it is expected that the student be able to: 1 Apply practical knowledge of a range of standard electronic devices and circuit functions and techniques 2 Identify choices in implementing a design for a given problem and make tradeoffs on the basis of the relative merits of different approaches 3 Assemble, test and debug the hardware and software components of simple electronic systems.
Assessment:	One, written examination, not exceeding three hours, at the end of semester, worth 60% Continuous assessment of project work, including submitted work, not exceeding 30 pages in total over the semester (approximately 30-35 hours of work), worth 30% A group oral presentation of 15 minutes duration at the end of semester (approximately 10-13 hours of work per student), worth 10%. Hurdle requirement: Students must pass the written exam to pass the subject. Intended Learning Outcomes (ILOs) 1 to 3 are assessed in the final written examination, and submitted project reports and the presentation.
Prescribed Texts:	None
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/2015/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2015/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2015/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2015/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 # Ability to conduct an engineering project # Ability to manage information and documentation # Capacity for independent critical thought, rational inquiry and self-directed learning # Expectation of the need to undertake lifelong learning, capacity to do so
Notes:	**LEARNING AND TEACHING METHODS** The subject is delivered through lectures and workshop classes that combine both tutorial and hands-on laboratory activities. **INDICATIVE KEY LEARNING RESOURCES** Students are given formal lectures and workshops structured to support students through project based learning. **CAREERS / INDUSTRY LINKS** # Engineers Australia # IEEE
Related Majors/Minors/ Specialisations:	B-ENG Electrical Engineering stream Master of Engineering (Electrical with Business) Master of Engineering (Electrical) Science-credited subjects - new generation B-SCI and B-ENG. Selective subjects for B-BMED