ELEN90042 Analogue Electronics

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 1 two hour lecture per week Total Time Commitment: 200 hours
Prerequisites:	Admission into the MC-NE Master of Nanoelectronic Engineering
Corequisites:	Corequisites for this subject are:

Subject	Study Period Commencement:	Credit Points:
ELEN90043 Device Models	Semester 1	12.50
ELEN90048 Passive Component Design & Simulation	Semester 1	12.50

Recommended Background Knowledge:	None
Non Allowed Subjects:	None
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:	Prof Stan Skafidas
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Subject Overview:	**AIMS** Current sources, single-stage amplifiers, and operational amplifiers are critical components in the design of real systems. This subject will teach students how to build those components and how to analyse noise, distortion, offsets and estimate circuit performance. Students will be introduced to the concept of process and temperature variation and methods to simulate circuit performance taking into account process and temperature variation. Students will also be introduced to circuit design techniques to contend with these real world issues in circuit and system design. **INDICATIVE CONTENT** Topics include: Operational principle and layout structure of transistors; design of current sources, single-stage amplifiers, and operational amplifiers; noise analysis; feedback; stability analysis of amplifier design; process and temperature variation and methods to simulate circuit performance taking into account process and temperature variation. Circuit design techniques to contend with these real world issues in circuit and system design.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)**

	Having completed this subject it is expected that the student be able to: 1 Explain the fundamentals of the operation of transistors 2 Explain the sources of noise in the circuit 3 Design current sources, single-stage amplifiers, and operational amplifiers 4 Build circuits to counteract process and component mismatch with nano-electronic components and devices 5 Use a range of software systems to design described nano-electronic components
Assessment:	One written examination (not exceeding three hours) at the end of semester, worth 70%; Continuous assessment of submitted project work (not exceeding 30 pages in total over the semester, approximately 40-45 hours of work), worth 30%. Intended Learning Outcomes (ILOs) 1, 2, 3 and 4 are assessed in the final written examination. ILOs 1-5 are assessed in the submitted design project reports.
Prescribed Texts:	None
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	# Ability to apply knowledge of science and engineering fundamentals # Ability to undertake problem identification, formulation, and solution # Ability to utilise a systems approach to complex problems and to design and operational performance # Ability to build and test real world systems that meet industry specialisation and manufacturing standards # Capacity for lifelong learning and professional development
Notes:	**INDICATIVE KEY LEARNING RESOURCES** Students are provided with lecture slides, tutorials and worked solutions, a problem set and solutions, and reference text lists. **INDICATIVE KEY LEARNING RESOURCES** Students are provided with lecture slides, tutorials and worked solutions, a problem set and solutions, and reference text lists. **CAREERS / INDUSTRY LINKS** Exposure to practical analog electronic design through lab visits
Related Course(s):	Master of Nanoelectronic Engineering