ELEN90062 High Speed Electronics

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours of lectures and up to 24 hours of workshops Total Time Commitment: 200 hours
Prerequisites:	Prerequisite for this subject is:

Subject	Study Period Commencement:	Credit Points:
ELEN90056 Electronic Circuit Design	Semester 1	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Anti-requisites for this subject are:

Subject	Study Period Commencement:	Credit Points:
ELEN40009 RF, Microwave and Optoelectronic Systems	Not offered 2016	12.50
ELEN40010 Digital Systems 4: High Speed Systems	Not offered 2016	12.50

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 Dower, Prof Stan Skafidas
Contact:	Assoc Prof Peter Dower Email: **pdower@unimelb.edu.au (mailto:pdower@unimelb.edu.au)** Prof Efstratios Skafidas Email: **sskaf@unimelb.edu.au (mailto:sskaf@unimelb.edu.au)**
Subject Overview:	**AIMS** The aim of the subject is to provide theoretical and practical treatment of high-speed electronics. Through the subject, students will grasp the fundamental properties and models of high-speed signals and interconnects, acquire high-speed digital design skills with a focus on the modelling, analysis, design and application of high speed transistors, logic gates and modern logic families, and master the high-speed analogue design capability including the design of oscillators and filters for RF applications. The students will be exposed to the state-of-the-art technologies that are shaping the fast evolving semiconductor industry. **INDICATIVE CONTENT** The topics include: # Fundamental properties of analogue systems

	# Smith charts: principles and applications # High-speed analogue circuits: voltage control oscillators, matching networks, and low noise amplifiers # Bipolar junction transistors: device, switching, and logic # CMOS: device, switching and logic # High-speed signalling consideration: power dissipation, heat, signal propagation, and termination
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO's)** Having completed this subject it is expected that the student be able to: 1 Understand the properties and fundamental limitations of high speed electronic systems in terms of the underlying physical principles 2 Quantitatively model and analyse high speed electronic systems and interconnects in both the digital and analogue domain 3 Simulate the behaviour of high speed electronic systems using software tools 4 Conduct basic test procedures for high speed signals and systems
Assessment:	One final written examination, not exceeding three hours at the end of semester, worth 70% Continuous assessment of submitted tutorial work, lab participation and reports, not exceeding 20 pages in total over the semester (approximately 25-30 hours of work per student), worth 20% A one hour mid-semester test, worth 10%. Hurdle requirement: Students must pass the written exam to pass the subject. Intended Learning Outcomes (ILO's) 1 and 2 are assessed in the final written examination, the mid-semester test, submitted tutorial work and lab reports. ILO's 3 and 4 are assessed in the lab participation and submitted lab reports
Prescribed Texts:	TBA
Recommended Texts:	# B.G. Streetman, S. Banerjee, Solid State Electronic Devices. Prentice-Hall, 6th Edition # H. Johnson, M.Graham, High-speed digital design. Prentice-Hall # David Pozar, Microwave Engineering # Thomas Lee, The Design of CMOS Radio-Frequency Integrated Circuits
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:	On completion of this subject, students will developed the following skills: # Ability to apply knowledge of basic science and engineering fundamentals # In-depth technical competence in at least one engineering discipline # Ability to undertake problem identification, formulation and solution # Ability to utilise a systems approach to design and operational performance # Capacity for independent critical thought, rational inquiry and self-directed learning # Ability to communicate effectively, with the engineering team and with the community at large
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 provided with lecture slides, lecture notes, tutorial worksheets and solutions, a laboratory manual, and reference book lists **CAREERS / INDUSTRY LINKS** The subject helps the students to acquire skill sets essential to the electrical engineers working for he companies and corporations in high-speed electronics industry such as Cadence Design Systems and Agilent Technologies.

Related Majors/Minors/ Specialisations:	B-ENG Electrical Engineering stream Master of Engineering (Electrical with Business) Master of Engineering (Electrical) Master of Engineering (Mechatronics)