# ELEN90062 High Speed Electronics

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| **Credit Points:** | 12.50 |
| **Level:** | 9 (Graduate/Postgraduate) |
| **Dates & Locations:** | 2012, Parkville<br>This subject commences in the following study period/s:<br>Semester 2, Parkville - Taught on campus. |
| **Time Commitment:** | Contact Hours: 36 hours of lectures and up to 24 hours of workshops Total Time Commitment: 120 hours |
| **Prerequisites:** | Prerequisite for this subject is: |

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

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

| Subject | Study Period Commencement: | Credit Points: |
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| ELEN40009 RF, Microwave and Optoelectronic Systems | Not offered 2012 | 12.50 |
| ELEN40010 Digital Systems 4: High Speed Systems | Not offered 2012 | 12.50 |

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| **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/ |
| **Contact:** | Dr. Peter Dower<br>Assoc Prof William Shieh<br>Email: **elen-subjectenquiry@unimelb.edu.au (mailto:elen-subjectenquiry@unimelb.edu.au)** |
| **Subject Overview:** | This subject provides theoretical and practical treatment of high-speed electronics. Students will study topics including:<br># Fundamental properties and models of high-speed signals and interconnects, including signal integrity issues, transmission line effects and terminations, electromagnetic interference, crosstalk, ground bounce and shielding;<br># High-speed digital design with a focus on the modelling, analysis, design and application of high speed transistors, logic gates and modern logic families;<br># High-speed analog design including the design of oscillators and filters for RF applications; and<br># Measurement and test for high-speed electronic systems.<br>This material will be complemented by exposure to software tools for circuit simulation and practical laboratory skills. |

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| **Objectives:** | On completing this subject the student should be able to:<br># Explain the properties and fundamental limitations of high speed electronic systems in terms of the underlying physical principles;<br># Quantitatively model and analyse high speed electronic systems and interconnects in both the digital and analog domain;<br># Simulate the behaviour of high speed electronic systems using software tools;<br># Conduct basic test procedures for high speed signals and systems |
| **Assessment:** | One written examination, not exceeding three hours at the end of semester, worth 70% (must pass written exam to pass subject); Continuous assessment of submitted project work, not exceeding 30 pages over the semester, worth 30%. |
| **Prescribed Texts:** | TBA |
| **Recommended Texts:** | # B.G. Streetman, S. Banerjee, Solid State Electronic Devices. Prentice-Hall, 6th Edition<br># H. Johnson, M.Graham, High-speed digital design. Prentice-Hall<br># David Pozar, Microwave Engineering<br># 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:** | # Ability to apply knowledge of basic science and engineering fundamentals<br># In-depth technical competence in at least one engineering discipline<br># Ability to undertake problem identification, formulation and solution<br># Ability to utilise a systems approach to design and operational performance<br># Capacity for independent critical thought, rational inquiry and self-directed learning<br># Ability to communicate effectively, with the engineering team and with the community at large |
| **Related Course(s):** | Bachelor of Engineering (Computer Engineering)<br>Bachelor of Engineering (Electrical Engineering)<br>Bachelor of Engineering (Electrical) and Bachelor of Arts<br>Bachelor of Engineering (Electrical) and Bachelor of Commerce<br>Bachelor of Engineering (EngineeringManagement) Electrical<br>Postgraduate Certificate in Engineering |
| **Related Majors/Minors/ Specialisations:** | B-ENG Electrical Engineering stream<br>Master of Engineering (Electrical) |