ELEN90057 Communication Systems

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2012, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 3 x one hour lectures; 12 hours of tutorials; and 12 hours of workshops Total Time Commitment: 120 hours
Prerequisites:	Prerequisites for this subject are:

Subject	Study Period Commencement:	Credit Points:
ELEN30012 Signals and Systems	Semester 2	12.50

AND

either of the following subjects

Subject	Study Period Commencement:	Credit Points:
ELEN90054 Probability and Random Models	Semester 1	12.50
MAST30020 Probability and Statistical Inference	Semester 1	12.50
MAST30001 Stochastic Modelling	Semester 2	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Anti-requisite for this subject is:

Subject	Study Period Commencement:	Credit Points:
ELEN30003 Communication Systems	Not offered 2012	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/
Contact:	Assoc Prof Girish Nair Email: **elen-subjectenquiry@unimelb.edu.au (mailto:elen-subjectenquiry@unimelb.edu.au)**
Subject Overview:	This subject provides an introduction to the analysis and design of telecommunication signals and systems. The emphasis is on understanding the basic concepts that underpin both analog and digital formats. Topics to be covered include: # Random processes in the time-domain, spectral analysis, Gaussian and white processes, transmission through linear time-invariant dynamical systems, low-pass representations of band-pass signals and systems, channel distortion and delay; # Time- and frequency-domain models for analog modulation and demodulation schemes, including conventional amplitude modulation (AM), double sideband suppressed carrier

	(DSBSC), single sideband (SSB) and frequency modulation (FM), threshold effects in AM and FM, and signal-to-noise ratio (SNR) analysis for AM and FM; # Nyquist's sampling theorem, quantisation, and digital modulation schemes including baseband pulse amplitude modulation (PAM), amplitude shift keying (ASK) and orthogonal signalling (FSK), synchronisation, matched filter receivers for additive white Gaussian noise (AWGN) channels, and bit-error analysis; # Comparisons of analog and digital schemes in terms of spectral efficiency, transmission power, demodulated SNR and complexity. This material is complemented by project work in a laboratory setting.
Objectives:	On completing this subject the student should be able to: # Qualitatively describe the basic functional blocks of a telecommunication system; # Quantitatively analyse the overall performance of analog and digital communication schemes; # Assess the relative merits of different modulation and demodulation techniques and make design choices on this basis; # Use software tools to simulate the behaviour of simple communication 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 20 pages over the semester, worth 20%; A one-hour mid-semester test, worth 10%.
Prescribed Texts:	TBA
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 # 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
Related Course(s):	Postgraduate Certificate in Engineering
Related Majors/Minors/ Specialisations:	B-ENG Electrical Engineering stream Master of Engineering (Electrical)