431-327 Communication Systems

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: Twenty-four hours of lectures, 12 hours of practice classes/tutorials and 12 hours of laboratory work Total Time Commitment: Not available
Prerequisites:	**431-221** Fundamentals of Signals and Systems, and **431-325** Stochastic Signals and Systems or approved equivalent..
Corequisites:	None
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 Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Coordinator:	Assoc Prof Girish Nair
Subject Overview:	On completion of this subject students should understand the use of signals and systems and random process theory in the modelling and analysis of analog and baseband digital communication systems. Topics include: revision of signals and systems; linear time-invariant channel models; amplitude modulation (AM) and related modulation formats; frequency modulations (FM);revision of random processes and noise; noise analyses of AM and FM in terms of signal-to-nosie ratios (SNR); nyquist sampling; sampling of random processes; quantisation; pulse-code modulation (PCM); waveform coding; matched filtering and probabilities of bit error for addictive white gaussian noise (AWGN) channels; intersymbol interference (ISI); SNR comparison of PCM and analog modulation formats. All concepts are illustrated by examples from wireline, wireless and optical communications.
Objectives:	On completing this subject the student should be able to: 1. Qualitatively describe the basic functional blocks of a telecommunication system; 2. Quantitatively analyse the overall performance of analog and digital communication schemes; 3. Assess the relative merits of different modulation and demodulation techniques and make design choices on this basis; 4. Use software tools to simulate the behaviour of simple communication systems.
Assessment:	Tests, assignments and laboratory reports not greater then 20 pages each due throughout the semester, and one 3-hour formally supervised written examination at the end of the semester. Students will be notified of the relative weight of each assessment component at the beginning of the semester.

Prescribed Texts:	None
Recommended Texts:	Information Not Available
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 # ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member # understanding of professional and ethical responsibilities and commitment to them # expectation of the need to undertake lifelong learning, capacity to do so # capacity for independent critical thought, rational inquiry and self-directed learning # intellectual curiosity and creativity, including understanding of the philosophical and methodological bases of research activity # openness to new ideas and unconventional critiques of received wisdom # profound respect for truth and intellectual integrity, and for the ethics of scholarship
Related Course(s):	Bachelor of Engineering (Computer Engineering)/Bachelor of Science Bachelor of Engineering (Electrical Engineering) Bachelor of Engineering (Electrical Engineering)/Bachelor of Science Bachelor of Engineering (Electrical) and Bachelor of Arts Bachelor of Engineering (Electrical) and Bachelor of Commerce Bachelor of Engineering (Electrical) and Bachelor of Laws Bachelor of Engineering (EngineeringManagement) Electrical