431-628 Transmission Systems

Credit Points:	12.500
Level:	Graduate/Postgraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 1, - Taught on campus. Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: 3 hours per week; Non-contact time commitment: 84 hours Total Time Commitment: Not available
Prerequisites:	Knowledge of communications systems at final year undergraduate level
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
Subject Overview:	This subject covers the basic areas of physical and MAC layers in modern wireline and wireless communications. In particular, it includes the following topics: • Structures of analog and digital transmission systems. • Advanced principles of multiplexing and multiple accesses. • Mathematical tools for analysis of transmission signals and circuits. • Signal processing in digital and analog transmissions. • Digital representation of analog signals • Voice encoding in mobile technologies. • VoIP transmission. • Modulation techniques. • Error handling techniques. On completion of this subject, the students will develop skills and knowledge required to understand the fundamentals of transmission systems and to be able to solve technical problems in the following areas: • Mathematical description of deterministic and random signals and circuits. • Deterministic and random signals transmission over linear circuits. • Signals impairments in transmission over noisy channels. • Channel capacity in noisy and bandwidth limited environments. • Digital encoding of analog signals, including voice encoding. • Baseband and pass-band analog and digital modulation. • Error detection and error correction techniques. The students should be able to assess performance of transmission systems, interpret the results and to propose solutions for performance enhancements. They should have the ability to utilise a system approach to design and performance evaluation of telecommunication systems, Furthermore, they should be able to evaluate the applicability of different performance enhancement methods to wireless and wireline communication systems and to assess the gain that can be achieved.

Assessment:	• Formally supervised written examination - 3 hours 70% (end of semester). This final exam is a hurdle. A student must pass the exam to pass the subject. • Written class test – 1 hour 30% (mid semester);
Prescribed Texts:	Textbook:• Leon W.Couch. Digital and Analog Communication Systems. Prentice-Hall Int. 2001. Additional Reading: • Simon Haykin. Communication Systems. John Wiley&Sons, Inc 2001 • John G. Proakis. Digital Communications. McGraw-Hill. 2001. • Bernard Sklar. Digital Communications. Prentice-Hall International. 2001.
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, the students should have developed: • problem solving and analytical skills, • critical and creative thinking, with an aptitude for continued self-directed learning; • sense of intellectual curiosity; • ability to interpret data and research results; • ability to learn in a range of ways, including through information and communication technologies; • capacity to confront unfamiliar problems; • ability to evaluate and synthesise the research and professional literature; • ability to develop models of practical applications and evaluate their performance by rigorous analytical means;
Related Course(s):	Master of Telecommunications Engineering