431-620 Fundamentals of Network Design

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: 36 Total Time Commitment: Not available
Prerequisites:	4-year Electrical Engineering degree or 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:	Dr Robert Edwin Warfield
Subject Overview:	This subject will include: # Principles of Network Design using economic optimization # Introduction to search and optimization techniques and to standard network problems including shortest paths, minimal spanning tree, and travelling salesman # Review of Probability Theory # Analysis and design of systems for availability and reliability # Methods of Measurement and Forecasting # High-level overview of Teletraffic, including Erlang Loss Formula Network dimensioning for teletraffic performance and commercial objectives.
Objectives:	This course is designed to prepare students for a responsible position in industry. It aims to develop the student's ability to explain principles and solve problems in Network Design. The aim of this subject is to provide students with state of the art knowledge and techniques so they are able to apply operations research knowledge to optimal dimensioning and design of telecommunication networks.
Assessment:	Assessment will be based on a Project (Group work) and a Final Examination. Group Seminar on Project 5% (group mark) Written Report on Project. Maximum 1500 words per student. 25% (group mark) 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.
Prescribed Texts:	Given the breadth of the topics covered, no single text is required. The following books are recommended as additional resources: Hwei Hsu (1997) "Probability, Random Variables, & Random Processes" Schaum Outline Series, McGraw Hill, 1997 Free Download: Linear Optimisation Course at http://ubmail.ubalt.edu/~harsham/opre640a/partVIII.htm Free Download: Teletraffic Engineering Handbook ITC in cooperation with ITU-D SG2, available at http://www.tele.dtu.dk/teletraffic/ Free Download: Graph Theory book at http://www.math.uni-hamburg.de/home/diestel/books/graph.theory/ describes Adjacency Matrix and other Graph Theoretic terms. Kershenbaum, "Telecommunications Network Design Algorithms". McGraw

	Hill International Additions, Computer Science Series, 1993. ISBN: 0-07-112518-3. (Now out of print, but copies are held in the library) David McDysan, Qos and Traffic Management in IP and ATM Networks", McGraw-Hill Professional, 1999
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:	At the end of the course, students will have developed: # Problem-solving abilities, characterized by flexibility of approach; # An understanding of the significance and value of their knowledge to the wider community, including business and industry; # An ability to evaluate and synthesize the research and professional literature in the discipline; # Advanced working skills in the application of computer systems and software and a receptiveness to the opportunities offered by new technologies; # A Capacity to manage competing demands on time, including self directed project work.
Related Course(s):	Master of Software Systems Engineering Master of Telecommunications Engineering