# ELEN90002 Fundamentals of Network Design

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| **Credit Points:** | 12.50 |
| **Level:** | 9 (Graduate/Postgraduate) |
| **Dates & Locations:** | 2010, Parkville<br>This subject commences in the following study period/s:<br>Semester 1, Parkville - Taught on campus. |
| **Time Commitment:** | Contact Hours: one 3- hours lecture per week Total Time Commitment: 120 hours |
| **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 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/ |
| **Coordinator:** | Dr Robert Warfield |
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| **Subject Overview:** | This subject explores the analysis, simulation, and design of telecommunications networks by applying methods of:<br># Transforming data to provide measurement information, forecasts, and decisions about network designs in the presence of uncertainty;<br># Search and optimization techniques, and a selection of standard algorithms including shortest path, minimal spanning tree, traveling salesman, and others;<br># Computer simulation methods including real-time and Monte Carlo techniques;<br># Analysis and design of systems for availability and reliability;<br># Economic optimisation under a range of constraints and objectives; |
| **Objectives:** | The aim of this subject is to provide students with state of the art knowledge and techniques so they are able to explain principles and solve problems in Network Design.<br>This subject is designed to prepare students for a responsible position in industry. It also includes a project that allows students who are interested in research to take on a research-oriented assignment. |
| **Assessment:** | Assessment will be based on a Team Project and a Final Examination.Team Seminar on Project: 5% (group mark) ,Written Report on Project. Maximum 1500 words per student: 25% (team mark), Formally supervised written 3-hour examination at end of Semester: 70% This final exam is a hurdle. Students must pass the exam to pass the subject. |

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| **Prescribed Texts:** | Given the breadth of the topics covered, no single text is required. |
| **Recommended Texts:** | Students will be referred to resources on the Internet for all topics. In addition, the following free books and courses are available on line:<br>M. Zukerman, Introduction to Queueing Theory and Stochastic Teletraffic Models, available at http://www.ee.unimelb.edu.au/staff/mzu/classnotes.pdf<br>Teletraffic Engineering Handbook ITC in cooperation with ITU-D SG2, available at http://www.tele.dtu.dk/teletraffic/<br>Graph Theory book available at<br>HTTP://www.math.uni-hamburg.de/home/diestel/books/graph.theory/<br>Linear Optimisation Course available at<br>HTTP://ubmail.ubalt.edu/~harsham/opre640a/partVIII.htm |
| **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:<br># Knowledge of the application of mathematical and computing techniques to the solution of engineering problems;<br># Problem-solving abilities;<br># Understanding of the value of their knowledge to prospective employers;<br># The ability to pursue lifelong learning goals;<br># Skills to manage competing demands on time |
| **Related Course(s):** | Master of Software Systems Engineering<br>Master of Telecommunications Engineering<br>Master of Telecommunications Engineering<br>Postgraduate Certificate in Engineering |