

## MAST20018 Discrete Maths and Operations Research

<b>Credit Points:</b>	12.50
<b>Level:</b>	2 (Undergraduate)
<b>Dates &amp; Locations:</b>	2010, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus. Lectures and practice classes.
<b>Time Commitment:</b>	Contact Hours: 3 x one hour lectures per week, 1 x one hour practice class per week Total Time Commitment: Estimated total time commitment of 120 hours
<b>Prerequisites:</b>	One of <ul style="list-style-type: none"> <li># <b>620-155 Calculus 2</b> (/view/2010/620-155)</li> <li># <b>620-158 Accelerated Mathematics 2</b> (/view/2010/620-158)</li> <li># 620-120 UMEP Maths for High Achieving Students (prior to 2008)</li> <li># 620-121 Mathematics A Advanced (prior to 2008)</li> <li># 620-140 Intermediate Mathematics (prior to 2008)</li> <li># 620-141 Mathematics A (prior to 2008)</li> </ul> Plus one of <ul style="list-style-type: none"> <li># <b>620-156 Linear Algebra</b> (/view/2010/620-156)</li> <li># <b>620-157 Accelerated Mathematics 1</b> (/view/2010/620-157)</li> <li># 620-122 Mathematics B Advanced (prior to 2008)</li> <li># 620-142 Mathematics B (prior to 2009)</li> <li># 620-190 UMEP Maths for High Achieving Students</li> <li># 620-192 Mathematics B (prior to 2006)</li> <li># 620-194 Mathematics B Advanced (prior to 2006)</li> <li># 620-211 Mathematics 2 Advanced (prior to 2008)</li> </ul>
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	Students may only gain credit for one of <ul style="list-style-type: none"> <li># 620-290 Discrete Maths and Operations Research</li> <li># 620-261 Introduction to Operations Research (prior to 2009)</li> </ul>
<b>Core Participation Requirements:</b>	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
<b>Coordinator:</b>	Prof Peter Forrester, Prof Peter Taylor
<b>Contact:</b>	Second Year Coordinator <b>Email: <a href="mailto:sycoord@ms.unimelb.edu.au">sycoord@ms.unimelb.edu.au</a> (mailto:sycoord@ms.unimelb.edu.au)</b>
<b>Subject Overview:</b>	This subject introduces the essential features of operations research methods, and also introduces the area of discrete mathematics as applied to social sciences. Operations research topics include mathematical modelling, linear programming, simplex and revised simplex methods, and duality theory. Discrete mathematics topics include scheduling, voting,

	fair division and bargaining. The subject material has a common theme of applications of mathematics in realistic settings encountered in the business world, industry and day-to-day life.
<b>Objectives:</b>	<p>On completion of this subject, students should:</p> <ul style="list-style-type: none"> <li># comprehend the essential features of problems encountered in Operations Research investigations, as well as those encountered in Discrete Mathematics applied to social sciences;</li> <li># develop basic skills required to construct formal mathematical models for practical optimization problems, and those required to analyze settings from the social sciences;</li> <li># appreciate the extent and limitations of a number of Operations Research techniques with respect to solving real-world optimization problems, and the difficulties which arise in formulating solutions to problems in the social sciences.</li> </ul>
<b>Assessment:</b>	Four written assignments due at regular intervals during semester amounting to a total of up to 50 pages (20%), and a 3-hour written examination in the examination period (80%).
<b>Prescribed Texts:</b>	None
<b>Breadth Options:</b>	<p>This subject potentially can be taken as a breadth subject component for the following courses:</p> <ul style="list-style-type: none"> <li># <b>Bachelor of Arts</b> (<a href="https://handbook.unimelb.edu.au/view/2010/B-ARTS">https://handbook.unimelb.edu.au/view/2010/B-ARTS</a>)</li> <li># <b>Bachelor of Commerce</b> (<a href="https://handbook.unimelb.edu.au/view/2010/B-COM">https://handbook.unimelb.edu.au/view/2010/B-COM</a>)</li> <li># <b>Bachelor of Environments</b> (<a href="https://handbook.unimelb.edu.au/view/2010/B-ENVS">https://handbook.unimelb.edu.au/view/2010/B-ENVS</a>)</li> <li># <b>Bachelor of Music</b> (<a href="https://handbook.unimelb.edu.au/view/2010/B-MUS">https://handbook.unimelb.edu.au/view/2010/B-MUS</a>)</li> </ul> <p>You should visit <b>learn more about breadth subjects</b> (<a href="http://breadth.unimelb.edu.au/breadth/info/index.html">http://breadth.unimelb.edu.au/breadth/info/index.html</a>) and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.</p>
<b>Fees Information:</b>	Subject EFTSL, Level, Discipline & Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a>
<b>Generic Skills:</b>	<p>In addition to learning specific skills that will assist students in their future careers in science, they will have the opportunity to develop generic skills that will assist them in any future career path. These include</p> <ul style="list-style-type: none"> <li># problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies;</li> <li># analytical skills: the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of analysis;</li> <li># collaborative skills: the ability to work in a team;</li> <li># time management skills: the ability to meet regular deadlines while balancing competing commitments.</li> </ul>
<b>Notes:</b>	<p>This subject is available for science credit to students enrolled in the BSc (both pre-2008 and new degrees), BAsC or a combined BSc course.</p> <p>A basic knowledge of Matlab such as would be gained by completing any of the following subjects will be assumed.</p> <ul style="list-style-type: none"> <li># <b>620-156 Linear Algebra</b> (<a href="/view/2010/620-156">/view/2010/620-156</a>)</li> <li># <b>620-157 Accelerated Mathematics 1</b> (<a href="/view/2010/620-157">/view/2010/620-157</a>)</li> <li># 620-142 Mathematics B (prior to 2009)</li> </ul>
<b>Related Course(s):</b>	Bachelor of Science