

COMP20005 Engineering Computation

Credit Points:	12.50																													
Level:	2 (Undergraduate)																													
Dates & Locations:	2013, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus. On campus only																													
Time Commitment:	Contact Hours: 60 hours, comprising of three 1-hour lectures and one 2-hour workshop per week Total Time Commitment: 120 hours																													
Prerequisites:	<p>One of:</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MAST10005 Calculus 1</td> <td>Not offered 2013</td> <td>12.50</td> </tr> <tr> <td>MAST10006 Calculus 2</td> <td>Not offered 2013</td> <td>12.50</td> </tr> <tr> <td>MAST10008 Accelerated Mathematics 1</td> <td>Not offered 2013</td> <td>12.50</td> </tr> <tr> <td>MAST10009 Accelerated Mathematics 2</td> <td>Not offered 2013</td> <td>12.50</td> </tr> </tbody> </table> <p>Plus one of: (these may be taken concurrently) 620 156 Linear Algebra 620 157 Accelerated Mathematics 1 620 158 Accelerated Mathematics 2</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MAST10007 Linear Algebra</td> <td>Not offered 2013</td> <td>12.50</td> </tr> <tr> <td>MAST10008 Accelerated Mathematics 1</td> <td>Not offered 2013</td> <td>12.50</td> </tr> <tr> <td>MAST10009 Accelerated Mathematics 2</td> <td>Not offered 2013</td> <td>12.50</td> </tr> </tbody> </table> <p>OR Admission to the MC-ENG Master of Engineering (../view/current/MC-ENG)</p>			Subject	Study Period Commencement:	Credit Points:	MAST10005 Calculus 1	Not offered 2013	12.50	MAST10006 Calculus 2	Not offered 2013	12.50	MAST10008 Accelerated Mathematics 1	Not offered 2013	12.50	MAST10009 Accelerated Mathematics 2	Not offered 2013	12.50	Subject	Study Period Commencement:	Credit Points:	MAST10007 Linear Algebra	Not offered 2013	12.50	MAST10008 Accelerated Mathematics 1	Not offered 2013	12.50	MAST10009 Accelerated Mathematics 2	Not offered 2013	12.50
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Recommended Background Knowledge:	<table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>ENGR10003 Engineering Systems Design 2</td> <td>Not offered 2013</td> <td>12.50</td> </tr> </tbody> </table>			Subject	Study Period Commencement:	Credit Points:	ENGR10003 Engineering Systems Design 2	Not offered 2013	12.50																					
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Non Allowed Subjects:	433 171 Introduction to Programming 433 151 Introduction to Programming (Advanced)																													
Core Participation Requirements:	<p>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,																													

	<p>Assessment and Generic Skills sections of this entry.</p> <p>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</p>
Coordinator:	Prof Alistair Moffat
Contact:	<p>Semester 1: Alistair Moffat email: ammoffat@unimelb.edu.au (mailto:ammoffat@unimelb.edu.au)</p> <p>Semester 2: Michael Kirley email: mkirley@unimelb.edu.au (mailto:mkirley@unimelb.edu.au)</p>
Subject Overview:	Many engineering disciplines make use of numerical solutions to computational problems. In this subject students will be introduced to the key elements of programming in a high level language, and will then use that skill to explore methods for solving numerical problems in a range of discipline areas.
Objectives:	<p>On successful completion of the subject students should be able to:</p> <ul style="list-style-type: none"> # Read, write and debug typical small-scale numerical programs in a high-level programming language (such as C) # Test and debug such programs # Argue for the correctness of such programs, from both a logical point of view and a numeric-soundness point of view # Be aware of the range of tools available for creating computational solutions to engineering problems, and be able to evaluate and choose between alternative approaches # Describe and employ the general concepts that apply when computers are used to solve mathematical problems # Demonstrate familiarity with the underlying theory behind a range of numerical algorithms used in commercial engineering software packages.
Assessment:	<p>Project work during semester, expected to take about 36 hours (30%), due in approximately Week 8 and Week 11 One mid-semester test (10%), held in Week 5 or Week 6 One 2-hour end-of-semester examination including a practical component (60%) To pass the subject, students must obtain at least: 50% overall - 12/30 in project work; 28/70 in the mid-semester test and end-of-semester written examination combined ILO1 is addressed in all components of assessment. ILO2 is assessed in the programming assignments. ILO3 is assessed in the programming assignments and in the examination. ILO4, ILO5, and ILO6 are assessed in the examination.</p>
Prescribed Texts:	None
Breadth Options:	<p>This subject potentially can be taken as a breadth subject component for the following courses:</p> <ul style="list-style-type: none"> # Bachelor of Arts (https://handbook.unimelb.edu.au/view/2013/B-ARTS) # Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2013/B-COM) # Bachelor of Environments (https://handbook.unimelb.edu.au/view/2013/B-ENVS) # Bachelor of Music (https://handbook.unimelb.edu.au/view/2013/B-MUS) <p>You should visit learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html) and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.</p>
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	<p>On completion of this subject students should have the:</p> <ul style="list-style-type: none"> # Ability to undertake problem identification, formulation and solution capacity for independent critical thought, rational inquiry and self-directed learning

	<ul style="list-style-type: none"> # Profound respect for truth and intellectual integrity, and for the ethics of scholarship # An ability to apply knowledge of basic science and engineering fundamentals
Notes:	<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. Students undertaking this subject will be expected to regularly access an internet-enabled computer.</p>
Related Majors/Minors/ Specialisations:	<p>B-ENG Electrical Engineering stream B-ENG Mechanical Engineering stream Computer Science Environments Discipline subjects Geomatics (Geomatic Engineering) major Master of Engineering (Biomedical) Master of Engineering (Electrical) Master of Engineering (Geomatics) Master of Engineering (Mechanical) Master of Engineering (Mechatronics) Master of Engineering (Software) Science credit subjects* for pre-2008 BSc, BAsC and combined degree science courses Science-credited subjects - new generation B-SCI and B-ENG. Core selective subjects for B-BMED.</p>