

# COMP30023 Computer Systems

<b>Credit Points:</b>	12.5									
<b>Level:</b>	3 (Undergraduate)									
<b>Dates &amp; Locations:</b>	2016, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.									
<b>Time Commitment:</b>	Contact Hours: 48 hours, comprising of two 1-hour lectures and one 1-hour tutorial and one 1-hour computer lab per week. Total Time Commitment: 170 hours									
<b>Prerequisites:</b>	Students must have completed ONE OF the following subjects: <table border="1" data-bbox="387 571 1484 777"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>COMP20003 Algorithms and Data Structures</td> <td>Semester 2</td> <td>12.50</td> </tr> <tr> <td>COMP20007 Design of Algorithms</td> <td>Semester 1</td> <td>12.50</td> </tr> </tbody> </table>	Subject	Study Period Commencement:	Credit Points:	COMP20003 Algorithms and Data Structures	Semester 2	12.50	COMP20007 Design of Algorithms	Semester 1	12.50
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COMP20003 Algorithms and Data Structures	Semester 2	12.50								
COMP20007 Design of Algorithms	Semester 1	12.50								
<b>Corequisites:</b>	None									
<b>Recommended Background Knowledge:</b>	None									
<b>Non Allowed Subjects:</b>	<table border="1" data-bbox="387 972 1484 1120"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>COMP30017 Operating Systems and Network Services</td> <td>Not offered 2016</td> <td>12.50</td> </tr> </tbody> </table>	Subject	Study Period Commencement:	Credit Points:	COMP30017 Operating Systems and Network Services	Not offered 2016	12.50			
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<b>Core Participation Requirements:</b>	<p>&lt;p&gt;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.&lt;/p&gt; &lt;p&gt;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: &lt;a href="http://services.unimelb.edu.au/disability"&gt;http://services.unimelb.edu.au/disability&lt;/a&gt;&lt;/p&gt;</p>									
<b>Coordinator:</b>	Assoc Prof Michael Kirley									
<b>Contact:</b>	Dr Michale Kirley email: <a href="mailto:mkirley@unimelb.edu.au">mkirley@unimelb.edu.au</a> (mailto:mkirley@unimelb.edu.au)									
<b>Subject Overview:</b>	<p><b>AIMS</b></p> <p>Over the last half-century, computers have improved at a faster rate than almost any other technology on the planet, yet the principles on which they work have remained mostly constant. In this subject, students will learn how computer systems work "under the hood".</p> <p>The specific aim of this subject is for the students to develop an understanding of the basic concepts underlying computer systems. A key focus of this subject is the introduction of operating systems principles and computer network protocols. This knowledge is essential for writing secure software, for writing high performance software, and for writing network-based services and applications.</p> <p><b>INDICATIVE CONTENT</b></p> <p>Topics covered include:</p>									

	<ul style="list-style-type: none"> <li># Introduction to computer organization</li> <li># The hardware/software interface</li> <li># The role of the operating system</li> <li># The memory hierarchy (caches, virtual memory, and working sets)</li> <li># Interrupt handling, processes and scheduling</li> <li># File systems</li> <li># Introduction to multiprocessors and synchronization</li> <li># Introduction to network protocols (OSI model)</li> <li># Development of client-server applications</li> <li># Computer system security and cryptographic protocols.</li> </ul>
<b>Learning Outcomes:</b>	<p><b>INTENDED LEARNING OUTCOMES (ILO)</b></p> <p>On completion of this subject students are expected to:</p> <ol style="list-style-type: none"> <li>1 Demonstrate their knowledge of operating systems from the programmer's perspective</li> <li>2 Demonstrate their knowledge of networking technologies from the programmer's perspective</li> <li>3 Apply this knowledge to select appropriate tools and technologies for a problem at hand</li> <li>4 Build simple server applications</li> <li>5 Recognise some common security vulnerabilities and the reason why they are present in a particular system</li> </ol>
<b>Assessment:</b>	<p>Project work throughout the semester, usually completed in two separate stages (tasks), requiring approximately 30 - 35 hours of work (30%) due in the middle of semester and at the end of semester. One mid-semester test (10%) One 2-hour end-of-semester examination (60%). Hurdle requirement: To pass the subject, students must obtain at least: 50% overall, 15/30 for the project work And 35/70 for the mid-semester test and end-of-semester written examination combined. Intended Learning Outcomes (ILOs) 1-5 are addressed in the projects, the mid-semester test, and the final exam.</p>
<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/2016/B-ARTS">https://handbook.unimelb.edu.au/view/2016/B-ARTS</a>)</li> <li># <b>Bachelor of Commerce</b> (<a href="https://handbook.unimelb.edu.au/view/2016/B-COM">https://handbook.unimelb.edu.au/view/2016/B-COM</a>)</li> <li># <b>Bachelor of Environments</b> (<a href="https://handbook.unimelb.edu.au/view/2016/B-ENVS">https://handbook.unimelb.edu.au/view/2016/B-ENVS</a>)</li> <li># <b>Bachelor of Music</b> (<a href="https://handbook.unimelb.edu.au/view/2016/B-MUS">https://handbook.unimelb.edu.au/view/2016/B-MUS</a>)</li> </ul> <p>You should visit <a href="http://breadth.unimelb.edu.au/breadth/info/index.html">learn more about breadth subjects (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>On completion of this subject, students should have developed the following skills:</p> <ul style="list-style-type: none"> <li># An ability to apply knowledge of basic science and engineering fundamentals</li> <li># An ability to undertake problem identification, formulation and solution</li> <li># The capacity to solve problems, including the collection and evaluation of information</li> <li># The capacity for critical and independent thought and reflection</li> <li># An expectation of the need to undertake lifelong learning, and the capacity to do so.</li> </ul>
<b>Notes:</b>	<p><b>LEARNING AND TEACHING METHODS</b></p> <p>The subject is delivered through a combination of lectures and workshops (tutorial and individual/group work). Students get a hands-on introduction to advanced programming through a series of problem solving exercises. Tasks will encapsulate operating system fundamentals</p>

and computer network protocols and services. Students will then go on to complete project work. Students will also learn how to use basic cryptographic primitives to protect data privacy and integrity. Students will begin to gain an understanding of how to analyse cryptographic protocols and what degree of privacy and integrity they achieve.

#### **INDICATIVE KEY LEARNING RESOURCES**

Students have access to lecture notes, lecture slides, tutorial worksheets, a programming environment and the Department servers. The subject LMS site contains links to recommended resources relating to basic/advanced programming, and advanced problems resources relating to basic/advanced programming, and advanced problems for students who want to extend themselves.

#### **CAREERS / INDUSTRY LINKS**

The IT industry is a large and steadily growing industry. Skills in operating systems and programming development that exploits the underlying computer system are essential for working in the IT industry, for example in software development companies, website development companies, telecommunication companies and game development companies. There is scope for a range of companies/organisations to be involved in the delivery of the subject (through guest lectures etc.) including AURIN (Australian Urban Research Infrastructure Network: geomatics, distributed computing, web development), VLSCI (Victorian Life Sciences Computing distributed computing, big data).

#### **Related Majors/Minors/ Specialisations:**

Computer Science  
 Computer Science  
 Computer Science  
 Computer Science  
 Computing and Software Systems  
 Master of Engineering (Software with Business)  
 Master of Engineering (Software)  
 Science-credited subjects - new generation B-SCI and B-ENG.