

# COMP30019 Graphics and Interaction

<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 2, Parkville - Taught on campus.												
<b>Time Commitment:</b>	Contact Hours: 48 hours, comprising of two 1-hour lectures and one 2-hour tutorial per week Total Time Commitment: 170 hours												
<b>Prerequisites:</b>	Students must have completed <b>ONE</b> of the following subjects: <table border="1" data-bbox="387 584 1485 846"> <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> <tr> <td>COMP90038 Algorithms and Complexity</td> <td>Semester 1, Semester 2</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	COMP90038 Algorithms and Complexity	Semester 1, Semester 2	12.50
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COMP90038 Algorithms and Complexity	Semester 1, Semester 2	12.50											
<b>Corequisites:</b>	None												
<b>Recommended Background Knowledge:</b>	None												
<b>Non Allowed Subjects:</b>	Students cannot enrol in and gain credit for this subject and: 433-380 Graphics and Computation 433-371 Interactive System Design												
<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 Adrian Pearce												
<b>Contact:</b>	email: <a href="mailto:adrianrp@unimelb.edu.au">adrianrp@unimelb.edu.au</a> (mailto:adrianrp@unimelb.edu.au)												
<b>Subject Overview:</b>	<p><b>AIMS</b></p> <p>This subject introduces the technologies of computer graphics and human-computer interaction along with the biological, psychological and social aspects of human perception and action that inform the application of those technologies. The emphasis is on 2D and 3D computer graphics and the geometric modelling techniques used for representing and interacting with objects in dynamic scenes. Techniques considered include transformation geometry, illumination models and the real-time rendering (shading) models. The subject is centred on developing Apps for tablet computers based on natural user interfaces (NUIs), a term used by developers of human-machine interfaces that effectively become invisible to their users through successive learned interactions. Technologies likely to be considered are: virtual reality, computer games, augmented reality, tele-presence, or other modalities such as interaction through the sense of</p>												

	<p>touch, audio or image processing and analysis. This subject supports course-level objectives by allowing students to develop analytical skills to understand the complexity of developing real-world computer graphics and interaction applications.</p> <p><b>INDICATIVE CONTENT</b></p> <p>Topics are drawn from computational geometry and human-computer interaction including:</p> <ul style="list-style-type: none"> <li># 2D and 3D computer graphics</li> <li># Colour and illumination models</li> <li># Raster and vector graphics</li> <li># Geometric modelling</li> <li># Rendering (shading) and visualisation</li> <li># Geometric transformations (including projection)</li> <li># Computational matrix geometry and/or animation (kinematics)</li> <li># Interaction categories and styles (particularly graphical user interfaces)</li> <li># Usability and accessibility (including interaction for people with disabilities).</li> </ul>
<p><b>Learning Outcomes:</b></p>	<p><b>INTENDED LEARNING OUTCOMES (ILO)</b></p> <p>On completion of this subject the student is expected to:</p> <ol style="list-style-type: none"> <li>1 Understand the theoretical concepts of computational geometry and human-computer interaction</li> <li>2 Be able to evaluate, design, and implement software for computer graphics and human-computer interaction</li> <li>3 Understand the strengths and weaknesses of different technological approaches to computer graphics and interaction</li> <li>4 Be able to use of computer graphics and other appropriate technologies for developing applications</li> <li>5 Apply principles of computer graphics to specific problems in a variety of domains.</li> </ol>
<p><b>Assessment:</b></p>	<p>Attendance and participation in laboratory classes with one team-based programming assignment (10%) between Weeks 5 to 7, involving 2 to 3 team members, each committing 10 - 13 hours of work including preparation. ILOs 3 to 4 are addressed in these laboratory classes. One written 60 minutes test (10%) held in Weeks 5 to 6. ILOs 1 and 2 are addressed in the test. One programming-based assignment (30%) due in Weeks 11 to 12, requiring 30 - 35 hours of work. ILOs 3 to 5 are addressed in this assignment. One written 2-hour closed book end-of-semester examination (50%). ILOs 1 to 3 are addressed in the exam. Hurdle requirement: the examination is a hurdle and must be passed to pass the subject.</p>
<p><b>Prescribed Texts:</b></p>	<p>TBA</p>
<p><b>Breadth Options:</b></p>	<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 <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>
<p><b>Fees Information:</b></p>	<p>Subject EFTSL, Level, Discipline &amp; Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a></p>
<p><b>Generic Skills:</b></p>	<p>On completion of this subject students should have developed the following skills:</p> <ul style="list-style-type: none"> <li># Analytical and interpretative skills, through the conceptualization of classes of technology and through the analysis and development of real world cases</li> <li># Design skills, through proposing new uses of technology to support engineering tasks</li> <li># Team-work, through working on a group project</li> <li># Presentation skills.</li> </ul>

<p><b>Notes:</b></p>	<p><b>LEARNING AND TEACHING METHODS</b></p> <p>The subject involves two 1-hour lectures per week followed by one 2-hour tutorial (workshop) held in a computer laboratory. Weekly readings are assigned from textbooks, and weekly laboratory exercises are assigned. A significant amount of project work is assigned.</p> <p><b>INDICATIVE KEY LEARNING RESOURCES</b></p> <p>At the beginning of the year, the coordinator will propose textbook(s) on computer graphics and interaction and will be made available through the University Bookshop and library.</p> <p><b>CAREERS / INDUSTRY LINKS</b></p> <p>The University of Melbourne and Microsoft have created a new teaching innovative, Apps@Melbourne, for the many talented students keen on developing Apps for tablet computers. Students enrolled in this subject have the opportunity to publish Apps they have developed on the store to be made available to the wider community. The IT industry is a large and steadily growing industry and graphics and interaction is an integral part of many facets of this industry.</p>
<p><b>Related Majors/Minors/ Specialisations:</b></p>	<p>B-ENG Software Engineering stream  Computer Science  Computer Science  Computer Science  Computer Science  Computer Science  Computer Science  Computer Science  Master of Engineering (Software)  Science-credited subjects - new generation B-SCI and B-ENG.  Selective subjects for B-BMED</p>