

COMP90018 Mobile Computing Systems Programming

| Credit Points: | 12.5 | | | | | | | | |
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| Level: | 9 (Graduate/Postgraduate) | | | | | | | | |
| Dates & Locations: | 2016, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus. | | | | | | | | |
| Time Commitment: | Contact Hours: 24 hours of lectures, 12 hours of student presentations, 12 hours of tutorial/ laboratory classes Total Time Commitment: 200 hours | | | | | | | | |
| Prerequisites: | <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>COMP90015 Distributed Systems</td> <td>Semester 1, Semester 2</td> <td>12.50</td> </tr> </tbody> </table> | | | Subject | Study Period Commencement: | Credit Points: | COMP90015 Distributed Systems | Semester 1, Semester 2 | 12.50 |
| Subject | Study Period Commencement: | Credit Points: | | | | | | | |
| COMP90015 Distributed Systems | Semester 1, Semester 2 | 12.50 | | | | | | | |
| Corequisites: | None | | | | | | | | |
| Recommended Background Knowledge: | None | | | | | | | | |
| Non Allowed Subjects: | None | | | | | | | | |
| Core Participation Requirements: | <p><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, 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></p> | | | | | | | | |
| Coordinator: | Dr Aaron Harwood | | | | | | | | |
| Contact: | aharwood@unimelb.edu.au (mailto:aharwood@unimelb.edu.au) | | | | | | | | |
| Subject Overview: | <p>AIMS</p> <p>Mobile devices are ubiquitous nowadays. Mobile computing encompasses technologies, devices and software that enable (wireless) access to services anyplace, anytime, and anywhere. This subject will cover fundamental mobile computing techniques and technologies, and explain challenges that are unique to mobile computing. In particular, the development of software for mobile devices requires hands-on experience that cannot be captured using simulation environments or emulators. Mobile device have limited computing power and restrictions on the communication bandwidth, latency and network availability. Equally important, mobile device are also confined by their input mechanisms and their output capabilities such as screen size and resolution. This subject will enable students to develop mobile phone applications and provide them with hands-on experience.</p> <p>INDICATIVE CONTENT</p> <ul style="list-style-type: none"> # A survey of mobile operating systems and development environments; including a discussion of Android and iOS # Development of interfaces for mobile devices and dealing with different input modalities # Wireless messaging fundamentals such as push and pull, as well as messaging services such as SMS and MMS and their implementation # Wireless personal area network standards such as Bluetooth, UWB (ultra-wide band) and ZigBee | | | | | | | | |

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| | <ul style="list-style-type: none"> # Fundamentals of wireless wide area networks (WWAN) and 4G standards such as LTE and WiMAX enabling wireless broadband access, and the underlying code-, frequency- and time-based multiplexing techniques # Architectures for thin clients # Routing in mobile ad-hoc networks and vehicular ad-hoc networks # RFID (radio frequency identification), in particular how to interrogate RFID tags and anti-collision, and how to maintain security and privacy # In- and outdoor positioning techniques (GPS) for mobile devices, as location-based services are seen to be one of the key emerging application areas in mobile computing # Location privacy in mobile computing applications # Mobile agents, i.e., software programs that can migrate between different hosts. |
| Learning Outcomes: | <p>INTENDED LEARNING OUTCOMES (ILO)</p> <p>Having completed this unit the student is expected to:</p> <ol style="list-style-type: none"> 1 Develop a deeper understanding of mobile systems, their challenges, and their programming 2 Get hands-on experience on programming applications for mobile devices that includes the integration of sensed information 3 Learn to work in small effective teams 4 Discuss and present new mobile research topics and technologies in oral and written form |
| Assessment: | <p>Project work: implementation of a mobile phone application of a group of 3 students, requiring approximately 25 - 30 hours of work per student, due in week 11 (20%) A 20-minute presentation given by a 3-person group due in week 6 to week 10 in combination with a 3000-word report about a current research topic or technology in mobile computing , requiring approximately 25 - 30 hours of work, due in week 10 (20%) A 2-hour written examination at the end of the semester (60%). Hurdle requirement: To pass the subject, students must obtain at least: 50% overall 20/40 in the group-based work 25/60 in the end-of-semester written examination. Intended Learning Outcome (ILO) 1 is addressed in all assessment components. ILO 2 is addressed in the project work, ILO 3 in project work, the group presentation and the group report. ILO 4 is addressed in the group presentation and the group report.</p> |
| Prescribed Texts: | None |
| 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: | <p>On completion of this subject students should have the following skills:</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 # Profound respect for truth and intellectual integrity, and for the ethics of scholarship. |
| Notes: | <p>LEARNING AND TEACHING METHODS</p> <p>The subject will be delivered through a combination of lectures, tutorials, group presentations and team-based learning where a group of students jointly develops a mobile phone application. Students will also write a joint report about a current mobile research topic or technology.</p> <p>INDICATIVE KEY LEARNING RESOURCES</p> <p>Students will have access to lecture notes and lecture slides. The subject LMS site also contains links to recommended literature and current survey papers of mobile computing principles.</p> <p>CAREERS / INDUSTRY LINKS</p> <p>The number of mobile phones will soon exceed the number of people in the world. There is a large range of career opportunities in the area of mobile systems, for example in software development companies, the telecommunications industry, user interface design, mobile security applications or the gaming industry. The mobile service industry encompasses location-</p> |

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| | based services, content services, asset and fleet management, product tracking, as well as finance and payment services. |
| Related Course(s): | Doctor of Philosophy - Engineering Master of Information Technology Master of Information Technology Master of Philosophy - Engineering Master of Science (Computer Science) |
| Related Majors/Minors/ Specialisations: | Computer Science Computer Science MIT Computing Specialisation MIT Distributed Computing Specialisation MIT Health Specialisation Master of Engineering (Mechatronics) Master of Engineering (Software) |