COMP90025 Parallel and Multicore Computing

Credit Points:	12.5
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: 3 hours per week; Non-contact time commitment: 84 hours Total Time Commitment: 200 hours
Prerequisites:	Knowledge of Operating Systems and Networks, and C Programming.
Corequisites:	None
Recommended Background Knowledge:	C programming and UNIX familiarity.
Non Allowed Subjects:	None
Core Participation Requirements:	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. 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
Coordinator:	Dr Aaron Harwood
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Subject Overview:	**AIMS** The subject aims to introduce students to parallel algorithms and their analysis. Fundamental principles of parallel computing are discussed. Various parallel architectures and programming platforms are introduced. Parallel algorithms for different architectures, as well as parallel algorithms addressing specific scientific problems are critically analysed. **INDICATIVE CONTENT** Topics include: principles of parallel computing, PRAM model, PRAM algorithms, parallel architectures, OpenMP, shared memory algorithms, systolic algorithms, parallel communication patterns, PVM/MPI, scientific applications, hypercube, graph embeddings and extended parallel computing models.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** On completion of this subject the student is expected to: 1 Have an understanding of parallel algorithms, analysis and architectures 2 Obtain experience developing parallel algorithms for various parallel architectures
Assessment:	Intended Learning Outcomes (ILOs) 1 and 2 are addressed by extensive Project work requiring approximately 50 - 55 hours or work (40%), which involves programming exercises, measurements and analysis, architecture specific programming and written work ILO 1 is also addressed by one 3-hour end of semester examination (60%). Hurdle requirement: To pass the

	subject, students must obtain at least: 50% overall. 20/40 in the Project work 30/60 in the end-of-semester written examination.
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:	On completion of this subject the student should have the following skills: # 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:	**LEARNING AND TEACHING METHODS** The subject will be delivered through a combination of lectures, tutorials and project work. The project work involves developing parallel algorithms implemented on a variety of parallel architectures and report writing. **INDICATIVE KEY LEARNING RESOURCES** 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 parallel computing. Students will make use of parallel computer systems. **CAREERS / INDUSTRY LINKS** The subject provides the fundamentals in parallel computing that support a career in areas such as HPC Systems Administrator, HPC Programmer, Specialist Programmer, Systems Administrator, Numerical Modelling and Analytics Developer.
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:	MIT Distributed Computing Specialisation Master of Engineering (Software)