600-656 Experimental Methods

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: 36 hours comprising 2 one-hour lectures/week and 1 one-hour workshop/week. Total Time Commitment: Not available
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	None
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 Nicole Bell
Subject Overview:	This subject provides a full suite of tools for the sciences, in particular the experimental physical sciences. Five major areas will be covered: management of huge (petabyte) datasets, signal processing, advanced statistical methods, data mining and advanced experimental design. Where possible, the course will include specific case studies, drawn from the relevant disciplines. Examples are drawn from physics, mathematics, earth sciences and bioinformatics.
Objectives:	The objectives of this subject are: # to challenge the students to expand their knowledge of advanced experimental techniques; # to broaden their appreciation of new developments in areas such as grid computing; # to solve quantitative problems involving large experimental datasets; # to understand and implement standard signal processing algorithms in, for example, image analysis, time series analysis; # to understand the possible architectures to manage very large datasets; # to understand how one can distinguish a signal in the presence of large backgrounds through the use of data mining technologies.
Assessment:	Five assignments totalling up to 50 pages of written work (50%), spaced evenly throughout the semester, plus a three-hour end-of-semester written examination (50%).
Prescribed Texts:	Nil.
Recommended Texts:	Nil.
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:	At the completion of this subject, students should have gained skills in: # determining appropriate statistical techniques to apply to real-world problems and implement those techniques; # designing good experiments to solve well-posed problems; # applying abstract concepts to real-world situations; # solving relatively complicated problems using approximations; # participating as an effective member of a group in discussions and collaborative assignments; # managing time effectively in order to be prepared for group discussions and undertake the assignments and exam.
Notes:	Students undertaking this subject will be expected to use computers; suitable access will be provided on campus.
Related Majors/Minors/ Specialisations:	R05 RP Master of Science - Physics