431-483 Neuroimaging Methods

Credit Points:	12.50
Level:	4 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: Thirty-Six hours (24 hours of lectures and 12 hours of tutorials/supervised computer-based laboratory sessions). Total Time Commitment: Estimated total time of commitment of 120 hours per semester.
Prerequisites:	431-336 Neurons; from action potential to learning, 431-325 Stochastic Signals and Systems.
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:	Prof Anthony Burkitt
Subject Overview:	This subject introduces students to modelling and analysis techniques used in brain imagine research, based on magnetic resonance imaging (MRI) data. The course will include: introduction to Matlab programming; basic techniques for analysing structural, functional and diffusion MR images; techniques for modelling functional MR time series datasets.
Objectives:	The course objectives are to train students in the principles and practice of modelling and analysing MRI data in the context of neuroscience research. The course will provide students with a detailed understanding of MRI image processing, including structural, functional and diffusion MR data. Students will be instructed in the use of MatLab for image analysis, and will utilise this understanding to complete three computerbased projects.
Assessment:	One 2-hour examination (50%), two computer laboratory projects (20% each), one class presentation (5%) and one written report (5%).
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:	1. ability to apply knowledge of basic science and engineering fundamentals; 2. ability to communicate effectively, not only with engineers but also with the community at large; 3. ability to undertake problem identification, formulation and solution; 4. ability to utilise a systems approach to design and operational performance. 5. ability to function effectively as an individual and in multi-disciplinary teams, with the capacity to be a leader or manager as well as an effective team leader.

	6. understanding of the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development understanding of professional and ethical responsibilities and commitment to them 7. capacity for independent critical thought, rational inquiry and self-directed learning profound respect for truth and intellectual integrity and for the ethics of scholarship
Related Course(s):	Bachelor of Engineering (Biomedical)Biosignals