BMEN90001 Auditory Processing and Hearing Bionics

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 Hours; Non contact time commitment 84 Hours Total Time Commitment: 120 hours
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	431-482 Auditory Processing and Prostheses
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Coordinator:	Prof Anthony Burkitt
Contact:	Melbourne School of Engineering Office Building 173, Grattan Street The University of Melbourne VIC 3010 Australia General telephone enquiries + 61 3 8344 6703 + 61 3 8344 6507 Facsimiles + 61 3 9349 2182 + 61 3 8344 7707 Email **eng-info@unimelb.edu.au (mailto:eng-info@unimelb.edu.au)**
Subject Overview:	This subject introduces students to auditory processing (predominately in humans, but also including automatic speech recognition methods) and the prostheses available for treating auditory impairment (hearing aids and cochlear implants). Topics covered include: acoustics and auditory stimuli, physical characteristics of sound, properties of speech, auditory pathway, neural coding of sound, speech and language processing, auditory psychophysics, audio coding, automatic speech recognition, hearing loss and auditory impairment, measurements of auditory function, hearing aids, cochlear implants (the bionic ear), signal processing strategies for cochlear implants.
Objectives:	On successful completion, students should be able to: # Describe the physical characteristics of speech and sound # Describe the processing of sound carried out in the human auditory pathway # Measure the behaviour of the human auditory system using psychophysical procedures # Identify and describe the principles underlying different automatic speech recognition system # Interpret the results of the principal measures of auditory impairment # Identify the type of neural prosthesis appropriate for specific types of hearing impairment # Describe the signal processing carried out by a hearing aid

	# Describe the principal signal processing techniques used with cochlear implants # Identify the factors that determine the effectiveness of a cochlear implant for a particular patient
Assessment:	One 1-hour test (10%), One 2-hour examination (40%) Two assignments of 3,000 words equivalent each (50%) including a computer-based project using MATLAB.
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:	# Ability to apply knowledge of basic science and engineering fundamentals; # Ability to communicate effectively, not only with engineers but also with the community at large; # Ability to undertake problem identification, formulation and solution; # Ability to utilise a systems approach to design and operational performance. # 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. # 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 # 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):	Master of Biomedical Engineering Postgraduate Certificate in Engineering