

# ELEN90071 Auditory and Visual Processing

<b>Credit Points:</b>	12.50
<b>Level:</b>	9 (Graduate/Postgraduate)
<b>Time Commitment:</b>	Contact Hours: one 2 hours lecture per week Total Time Commitment: 200hours
<b>Prerequisites:</b>	Enrolment in a research higher degree(Masters or PhD) in Engineering
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	None
<b>Core Participation Requirements:</b>	<p>&lt;p&gt;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.&lt;/p&gt; &lt;p&gt;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: &lt;a href="http://services.unimelb.edu.au/disability"&gt;http://services.unimelb.edu.au/disability&lt;/a&gt;&lt;/p&gt;</p>
<b>Contact:</b>	<p>Assoc Prof David Grayden</p> <p>Email: <a href="mailto:grayden@unimelb.edu.au">grayden@unimelb.edu.au</a> (<a href="https://mce_host/faces/htdocs/%20grayden@unimelb.edu.au">https://mce_host/faces/htdocs/%20grayden@unimelb.edu.au</a>)</p>
<b>Subject Overview:</b>	<p><b>AIMS</b></p> <p>This subject has a twofold aim. First, it introduces students to auditory processing and auditory prostheses available for treating auditory impairment, and to visual processing and visual prostheses available for treating vision impairment. Topics covered in auditory processing and prostheses include: acoustics and auditory stimuli, auditory pathway, neural coding of sound, auditory psychophysics, hearing loss and auditory impairment, cochlear implants (the Bionic Ear) and cochlear implant stimulation strategies. Topics covered in visual processing and prostheses include: the retina, the visual pathway, vision psychophysics, visual prostheses, prosthetic vision and retinal implant stimulation strategies.</p> <p>Second, it introduces students to a number of important research skills: (i) how to prepare and present a lecture and (ii) how to provide feedback on the presentations of other students.</p> <p><b>INDICATIVE CONTENT</b></p> <p>Topics include:</p> <p>Acoustics and auditory stimuli, auditory pathway, neural coding of sound, auditory psychophysics, hearing loss and auditory impairment, cochlear implants (the Bionic Ear) and cochlear implant stimulation strategies, the retina, the visual pathway, vision psychophysics, visual prostheses, prosthetic vision and retinal implant stimulation strategies.</p>
<b>Learning Outcomes:</b>	<p><b>INTENDED LEARNING OUTCOMES (ILO)</b></p> <p>Having completed this subject it is expected that the student be able to:</p> <ol style="list-style-type: none"> <li>1. describe the processing of sound carried out in the auditory pathway</li> <li>2. measure the behaviour of the human auditory system using psychophysical procedures</li> <li>3. interpret the results of the principal measures of auditory impairment</li> <li>4. identify the type of neural prosthesis appropriate for specific types of hearing impairment</li> <li>5. describe the principal signal processing techniques used with cochlear implants</li> <li>6. identify the factors that determine the effectiveness of a cochlear implant for a particular patient</li> </ol>

	<p>7. describe the processing of vision carried out in the visual pathway</p> <p>8. measure the behaviour of the human visual system using psychophysical procedures</p> <p>9. interpret the results of the principal measures of visual impairment</p> <p>10. describe the principal signal processing techniques used with retinal implants</p> <p>11. identify the factors that determine the effectiveness of a vision implant for a particular</p>
<b>Assessment:</b>	<ul style="list-style-type: none"> <li>• A lecture of up to one hour, including question time, on a journal paper during the semester (25%);</li> <li>• A written report of up to 3000 words on the journal paper that was presented as a lecture during the semester (25%);</li> <li>• Five critiques of up to 750 words each of lectures presented by other students during the semester (10% each). Intended Learning Outcomes (ILOs)1-11 are assessed in a lecture presentation, written report and feedback critiques.</li> </ul>
<b>Prescribed Texts:</b>	None
<b>Recommended Texts:</b>	None
<b>Breadth Options:</b>	This subject is not available as a breadth subject.
<b>Fees Information:</b>	Subject EFTSL, Level, Discipline & Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a>
<b>Generic Skills:</b>	<ul style="list-style-type: none"> <li># In-depth technical competence in at least one engineering discipline</li> <li># Ability to undertake problem identification, formulation and solution</li> <li># Understanding of the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development</li> <li># Capacity for independent critical thought, rational inquiry and self-directed learning</li> <li># Intellectual curiosity and creativity, including understanding of the philosophical and methodological bases of research activity</li> <li># Openness to new ideas and unconventional critiques of received wisdom</li> </ul>
<b>Notes:</b>	<p><b>LEARNING AND TEACHING METHODS</b></p> <p>The subject is delivered through lectures. Each student delivers one lecture. Each student provides a critique of other students' lectures.</p> <p><b>INDICATIVE KEY LEARNING RESOURCES</b></p> <p>Students are provided with lecture slides, conference papers and journal papers.</p> <p><b>CAREERS / INDUSTRY LINKS</b></p> <p>Some lectures are delivered by guest lecturers from research institutes and/or industry.</p>
<b>Related Course(s):</b>	<p>Master of Philosophy - Engineering</p> <p>Ph.D.- Engineering</p>