

## ELEN90029 Statistical Signal Processing

<b>Credit Points:</b>	12.50
<b>Level:</b>	9 (Graduate/Postgraduate)
<b>Dates &amp; Locations:</b>	2010, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
<b>Time Commitment:</b>	Contact Hours: 24 hours; Non-contact time commitment: 96 hours Total Time Commitment: 120 hours
<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>	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: <a href="http://www.services.unimelb.edu.au/disability/">http://www.services.unimelb.edu.au/disability/</a>
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<b>Subject Overview:</b>	Topics include: a review of stochastic processes detection of random signals in noise; dynamical system models and associated state estimation algorithms (Kalman and Wiener filtering); parameter estimation algorithms (Least Squares, Maximum Likelihood) and their adaptive versions. Other topics to be selected from: nonlinear filtering; hidden Markov model signal processing; expectation maximization algorithm; distributed detection and estimation; information-theoretic aspects of estimation and detection (Cramer Rao bound, Divergence measures); array signal processing.
<b>Objectives:</b>	The aim of this subject is to give students a rigorous introduction to the mathematical tools commonly employed in statistical signal processing.
<b>Assessment:</b>	Continuous assessment of homework assignments, not exceeding 30 pages in total over the semester, worth 40%; Final examination at the end of semester, worth 60%. Students must pass the final exam in order to pass the subject.
<b>Prescribed 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># Ability to apply knowledge of basic science and engineering fundamentals;</li><li># In-depth technical competence in at least one engineering discipline;</li><li># Ability to undertake problem identification, formulation and solution;</li><li># Ability to utilise a systems approach to design and operational performance;</li><li># Expectation of the need to undertake lifelong learning, capacity to do so;</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><li># Profound respect for truth and intellectual integrity, and for the ethics of scholarship</li></ul>
<b>Related Course(s):</b>	Master of Applied Science (Electrical and Electronic) Master of Engineering Science (Electrical and Electronic) Master of Philosophy - Engineering Ph.D.- Engineering