

CHEN90034 Research Methods

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 1x three hour lectures per week and 6 x one hour seminars per semester Total Time Commitment: 200 hours
Prerequisites:	Enrolment in 351AA PhD in Engineering
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	<p><p>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.</p> <p>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</p> </p>
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Subject Overview:	<p>AIMS</p> <p>The aim of engineering and scientific research is to produce new knowledge. To be useful, new knowledge must be able to stand up to scrutiny, and its presentation to other researchers and/or to the public must be persuasive.</p> <p>This subject is an introduction to the processes of research as they apply to chemical and biochemical engineering, including chemical and biological safety and risk assessment, locating and critically analysing relevant literature, designing experiments, analysing data, writing papers, writing research proposals giving presentations and refereeing. Underlying all of these, the subject will foster the development of critical thinking, a sceptical, scientific perspective, and professional ethics.</p> <p>INDICATIVE CONTENT</p> <p>Topics covered include safety and risk assessments. Training in databases such as Web of Science and Scifinder scholar. Scientific ethics. Research impact measures and methods to maximise impact. Statistical analysis of data and proper reporting of data. Methods for scientific presentations; how to present engaging and entertaining scientific presentations. Guide to writing research proposals. Critically evaluating scientific manuscripts.</p>
Learning Outcomes:	<p>INTENDED LEARNING OUTCOMES (ILO)</p> <p>On completion of this subject the student is expected to:</p> <ol style="list-style-type: none"> 1 Understand the importance of safety and risk assessment in the conduct of experimental research

	<p>2 Describe the roles of rigour and scepticism in producing results of high impact</p> <p>3 Understand relevant statistical techniques including the use of error bars, t-statistics, ANOVA and non-linear linear regression analysis</p> <p>4 Explain the ethical guidelines governing academic research</p> <p>5 Demonstrate knowledge of and experience in research planning, conduct and analysis and in written and spoken communication.</p>
Assessment:	<p>Literature review approximately 2000 (10%). Time commitment of approximately 13-15 hours. Due week 6. Intended Learning Outcome (ILOs) 2, 4 and 5 are addressed in the Literature review Oral presentation (20%). Assessed week 10 and 11. ILO 1, 2, 4 and 5 are addressed in the oral presentation Research proposal - maximum 5 A4 pages (20%). Time commitment of approximately 25-30 hours. Due week 9. ILO 1, 2, 4 and 5 are addressed in the research proposal Critical review of research manuscript - maximum two pages (10%). Time commitment of approximately 13-15 hours. Due week 12. All ILOs 5 are addressed in the review A two hour end-of-semester exam (40%). All ILOs are addressed in the exam. Hurdle requirement: Passing the final exam and attendance at a minimum of 6 Departmental Seminars are required to pass the subject</p>
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:	<ul style="list-style-type: none"> # Safety in the laboratory and in engineering/chemical research # Ability to communicate scientific ideas in a range of formats, including written and spoken # Ability to critically evaluate scientific research.
Notes:	<p>LEARNING AND TEACHING METHODS</p> <p>The subject will be delivered through 1x three hour lectures per week and 6 x one hour seminars per semester Total. Time Commitment: 200 hours</p> <p>INDICATIVE KEY LEARNING RESOURCES</p> <p>Students will have access to lecture slides through LMS.</p> <p>CAREERS / INDUSTRY LINKS</p> <p>The skills gained in this course are vital for careers in academia and industrial research. Importantly, the comprehensive safety topics covered will further prepare students for the importance of safety at all work places including industry and academia. The subject will prepare students for a range of research careers in the process and chemical manufacturing industries, as well as medical and biotechnology research fields.</p>
Related Course(s):	<p>Master of Philosophy - Engineering</p> <p>Ph.D.- Engineering</p>