

# NEUR90007 Design and Analysis for Neurosciences A

<b>Credit Points:</b>	12.5						
<b>Level:</b>	9 (Graduate/Postgraduate)						
<b>Dates &amp; Locations:</b>	2015, Parkville This subject commences in the following study period/s: March, Parkville - Taught on campus.						
<b>Time Commitment:</b>	Contact Hours: 30 hours, 17 hours of lectures and 13 hours of tutorials over the five days. Total Time Commitment: 120 hours, including 30 contact hours						
<b>Prerequisites:</b>	None						
<b>Corequisites:</b>	Students based at the Melbourne Brain Centre and the Howard Florey Laboratories enrolling in this subject must also enrol in the following subjects at the same time: NEUR90009 Brain Imaging and Neural Networks A (12.5) or NEUR90010 Brain Imaging and Neural Networks B (6.25) NEUR90011 Molecular and Cellular Neuroscience A (12.5) or NEUR90012 Molecular and Cellular Neuroscience B (6.25) NEUR90013 Neuroscience of Behaviour & Cognition A (12.5) or NEUR90014 Neuroscience of Behaviour & Cognition B (6.25)						
<b>Recommended Background Knowledge:</b>	Basic statistical knowledge (ie means, standard deviation, confidence interval, distributions) is desirable but not essential.						
<b>Non Allowed Subjects:</b>	Students cannot enrol in and gain credit for this subject and: <table border="1" data-bbox="387 1229 1485 1377"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>NEUR90008 Design and Analysis for Neurosciences B</td> <td>March</td> <td>6.25</td> </tr> </tbody> </table>	Subject	Study Period Commencement:	Credit Points:	NEUR90008 Design and Analysis for Neurosciences B	March	6.25
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<b>Core Participation Requirements:</b>	For the purposes of considering requests 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 Overview, Objectives, 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 the Disability Liaison Unit: <a href="http://www.services.unimelb.edu.au/disability/">http://www.services.unimelb.edu.au/disability/</a>						
<b>Coordinator:</b>	Dr Kathelijne Lefevere, Prof Leonid Churilov						
<b>Contact:</b>	Dr Kathy Lefevere-Burd T: +61 3 9035 7082 E: <a href="mailto:lefevere@unimelb.edu.au">lefevere@unimelb.edu.au</a> (mailto:lefevere@unimelb.edu.au)  A/Professor Leonid Churilov T: +61 3 9035 7089 E: <a href="mailto:leonidc@unimelb.edu.au">leonidc@unimelb.edu.au</a> (mailto:leonidc@unimelb.edu.au)						

<p><b>Subject Overview:</b></p>	<p>This subject is an intensive 5 consecutive day program, introducing the main principles of scientific method, research design and scientific study validity using a structured approach. This subject will introduce the basic concepts of study design and layered topic-specific exercises and/or project-specific exercises. Students are taken through the initial "building blocks" that form the basis for a sound research study. This includes:</p> <ul style="list-style-type: none"> <li># fundamentals of scientific methods;</li> <li># study validity;</li> <li># sampling;</li> <li># measurement;</li> <li># establishing cause and effect relationship;</li> <li># making statistical conclusions; and</li> <li># designing good experimental designs.</li> </ul> <p>A second major component of this subject covers statistical analysis in some detail:</p> <ul style="list-style-type: none"> <li># hypotheses testing and statistical estimation;</li> <li># choosing a statistical test and/or model;</li> <li># power and sample size calculations as well as dealing with data;</li> <li># effective data management;</li> <li># analysis;</li> <li># presenting skills when using appropriate statistical software; and</li> <li># where and when to get statistical advice.</li> </ul> <p>The subject also introduces meta-analysis and highlights the guidelines for quality experimental neuroscience research.</p> <p>In-class discussions form an integral part of this subject and special emphasis is placed on the application of concepts taught to the student's individual research project through a multi-disciplinary group exercise. This culminates in class presentations at the end of the week; discussions concerning these presentations illustrate various types of study designs and analyses used for different types of research approaches (eg behavioural, molecular, cellular, imaging and clinical).</p>
<p><b>Learning Outcomes:</b></p>	<p>On completion of this subject students will be able to:</p> <ul style="list-style-type: none"> <li># Develop an overall understanding at basic to intermediate level of the main principles of good study design and analysis in basic and clinical neurosciences.</li> <li># Acquire basic to intermediate level competency in applying 'building blocks' of experimental design and analysis to a chosen research problem.</li> <li># Appreciate the ultimate importance of quality experimental design and analysis for the overall quality on neuroscience research.</li> <li># Become aware of the common pitfall areas where professional statistical expertise is required.</li> <li># Gain an awareness of different approaches to experimental study design as applied to different types of neurosciences' research projects.</li> <li># Demonstrate the application of the principles learned in the subject to their research project.</li> </ul>
<p><b>Assessment:</b></p>	<p>Full 5 days attendance of the subject and full participation in class exercises, group project, presentation and discussion are required. A minimum 85% attendance is required (= x 1); a pro rata attendance multiplier will apply to total assessment. One oral group presentation (total 20 min; 5 min per student) plus discussion; equivalent to 1,000 words, worth 20% times attendance multiplier. One written report on class exercises, equivalent to 2,000 words, worth 30% times attendance multiplier and to be submitted 2 weeks following delivery of the subject. One written proposal outlining study design, power and statistical analysis on the chosen research topic, 2,000 words, worth 50% times attendance multiplier and to be submitted by the end of August (ie. week 27).</p>
<p><b>Prescribed Texts:</b></p>	<p>None</p>

<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>	<p>On completion of this subject, students will have developed the following generic skills:</p> <ul style="list-style-type: none"><li># Research project design and analysis skills.</li><li># Competency in applying experimental design and statistical analysis principles to a variety of research questions and approaches.</li><li># Critical analysis capacity of different research areas in a multi-disciplinary field.</li><li># Awareness of the value of quality research and the wide-ranging consequences of biased research.</li><li># Advanced skills in formulating ideas clearly through oral, written and interpersonal communication.</li><li># The capacity to work in teams and collaborate with other disciplines in the area of neurosciences.</li><li># The capacity to apply concepts learned in their own area of research.</li></ul>