

# MAST20017 Applied Statistics for Optometrists

<b>Credit Points:</b>	12.50						
<b>Level:</b>	2 (Undergraduate)						
<b>Dates &amp; Locations:</b>	2011, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus. Lectures, practice classes and computer laboratory classes.						
<b>Time Commitment:</b>	Contact Hours: 3 x one hour lectures per week, 1 x one hour practice class per week, 1 x one hour computer laboratory class per week Total Time Commitment: Estimated total time commitment of 120 hours						
<b>Prerequisites:</b>	VCE Mathematical Methods 3/4.						
<b>Corequisites:</b>	None						
<b>Recommended Background Knowledge:</b>	None						
<b>Non Allowed Subjects:</b>	<p>Students may gain credit for only one of</p> <ul style="list-style-type: none"> <li># MAST20017 Applied Statistics for Optometrists</li> <li># 620-298 Data Analysis 2 (prior to 2010)</li> <li># 620-270 Applied Statistics (prior to 2009)</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Subject</th> <th style="text-align: left;">Study Period Commencement:</th> <th style="text-align: left;">Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MAST30015 Statistics for Mechanical Engineers</td> <td>Not offered 2011</td> <td>12.50</td> </tr> </tbody> </table> <p>Students who have completed either of the following may not enrol in this subject for credit</p> <ul style="list-style-type: none"> <li># 620-371 Linear Models (prior to 2010)</li> <li># 620-372 Applied Statistical Inference (prior to 2010)</li> </ul>	Subject	Study Period Commencement:	Credit Points:	MAST30015 Statistics for Mechanical Engineers	Not offered 2011	12.50
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MAST30015 Statistics for Mechanical Engineers	Not offered 2011	12.50					
<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>						
<b>Coordinator:</b>	Ms Sharon Gunn						
<b>Contact:</b>	Second Year Coordinator <b>Email: <a href="mailto:sycoord@ms.unimelb.edu.au">sycoord@ms.unimelb.edu.au</a> (mailto:sycoord@ms.unimelb.edu.au)</b>						
<b>Subject Overview:</b>	<p>This subject lays the foundations for an understanding of the fundamental concepts of probability and statistics, as they relate to optometry. Students will learn about the importance of good study design in scientific research, how to examine data to determine underlying structures, formulate statistical models for a range of practical situations and check the assumptions of the model in specific situations. They will also learn to use the computer to carry out standard statistical analyses and to express conclusions in scientifically useful terms.</p> <p>Topics include: probability, including the concepts of incidence, prevalence, specificity, sensitivity and predictive probability; Bayes' theorem. Random variables and their properties: distribution, mean, variance; binomial and normal distributions; random sampling. Statistical inference: estimation; confidence intervals; hypothesis testing; determination of sample size. Correlation and regression: assumptions; method of least squares; hypothesis testing; confidence and prediction intervals; residuals; transformations; polynomial regression. Analysis</p>						

	of variance models (one-way and two-way models): model specification; assumptions; estimation and hypothesis testing; interaction; transformations; residuals; diagnostics. Design of experiments: randomisation; replication; blocking; standard designs including completely randomised and randomised block designs. Guidelines for supporting an argument for cause and effect based on observational data. Contingency tables: tests for association; odds ratios. Use of the statistical package Minitab.
<b>Objectives:</b>	<p>Students completing this subject should:</p> <p>Comprehend:</p> <ul style="list-style-type: none"> <li># the fundamental concepts of probability and statistics as they relate to optometry;</li> <li># the basic principles of experimental design;</li> <li># how to examine data to determine underlying structures;</li> <li># how statistical models are used to analyse data.</li> </ul> <p>Have developed skills to:</p> <ul style="list-style-type: none"> <li># examine the data to determine underlying structures;</li> <li># formulate statistical models for a range of practical situations;</li> <li># check the assumptions of a model in specific situations;</li> <li># use a computer package (Minitab) to carry out standard statistical analyses;</li> <li># express the results of a statistical analysis in scientifically useful terms.</li> </ul> <p>Appreciate:</p> <ul style="list-style-type: none"> <li># the importance of good study design and its relevance to cause-and-effect arguments;</li> <li># the importance of statistical methods for interpreting data;</li> <li># the role and interplay of exploratory and formal aspects of data analysis</li> </ul>
<b>Assessment:</b>	Three or four written assignments due at regular intervals during semester amounting to a total of up to 50 pages (25%), and a 3-hour written examination in the examination period (75%).
<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>	<p>In addition to learning specific statistical skills, students will have the opportunity to develop generic skills that will assist them in any career path. These include:</p> <ul style="list-style-type: none"> <li># problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies;</li> <li># analytical skills: the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of analysis;</li> <li># collaborative skills: the ability to work in a team;</li> <li># time management skills: the ability to meet regular deadlines while balancing competing commitments.</li> <li># computer skills: the ability to use statistical computing packages.</li> </ul>
<b>Notes:</b>	<p>This subject is available only to Bachelor of Optometry students.</p> <p>Enrolment into this subject is only by invitation of the Head of Department.</p>
<b>Related Course(s):</b>	Bachelor of Optometry