MAST20017 Applied Statistics for Optometrists

Credit Points:	12.50
Level:	2 (Undergraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus. Lectures, practice classes and computer laboratory classes.
Time Commitment:	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
Prerequisites:	VCE Mathematical Methods 3/4.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students may gain credit for only one of # 620-272 Applied Statistics for Optometrists # 620-298 Data Analysis 2 (prior to 2010) # 620-270 Applied Statistics (prior to 2009), # **620-370 Statistics for Mechanical Engineers (/view/2010/620-370)** Students who have completed either of the following may not enrol in this subject for credit # 620-371 Linear Models (prior to 2010) # 620-372 Applied Statistical Inference (prior to 2010)
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Ms Sharon Gunn
Contact:	Second Year Coordinator **Email: sycoord@ms.unimelb.edu.au (mailto:sycoord@ms.unimelb.edu.au)**
Subject Overview:	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. 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 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.
Objectives:	Students completing this subject should: Comprehend: # the fundamental concepts of probability and statistics as they relate to optometry; # the basic principles of experimental design; # how to examine data to determine underlying structures; # how statistical models are used to analyse data. Have developed skills to: # examine the data to determine underlying structures; # formulate statistical models for a range of practical situations; # check the assumptions of a model in specific situations; # use a computer package (Minitab) to carry out standard statistical analyses; # express the results of a statistical analysis in scientifically useful terms. Appreciate: # the importance of good study design and its relevance to cause-and-effect arguments; # the importance of statistical methods for interpreting data; # the role and interplay of exploratory and formal aspects of data analysis
Assessment:	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%).
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:	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: # problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies; # 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; # collaborative skills: the ability to work in a team; # time management skills: the ability to meet regular deadlines while balancing competing commitments. # computer skills: the ability to use statistical computing packages.
Notes:	This subject is available only to Bachelor of Optometry students.
Related Course(s):	Bachelor of Optometry