620-159 Data Analysis 1

Credit Points:	12.50
Level:	1 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus. Lectures, practice classes and computer laboratory classes.
Time Commitment:	Contact Hours: 36 one-hour lectures (three per week), 11 one-hour practice classes (one per week), 11 one-hour computer laboratory classes (one per week). Total Time Commitment: 120 hours total time commitment
Prerequisites:	Study score of 25 or more in VCE Mathematical Methods 3/4, or equivalent, or *Introduction to Mathematics*.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students may only gain credit for one of 620-152 (prior to 2008), *Data Analysis 1*, 620-160 (prior to 2008), *Experimental Design and Data Analysis* or 316-130 Quantitative Methods 1. Students who have completed *Statistics*, 620-270 (prior to 2009) or *Applied Statistics for Optometrists* may not enrol in this subject for credit.
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 participation are encouraged to discuss this with the subject coordinator and the Disability Liaison Unit.
Coordinator:	Dr Guoqi Qian
Subject Overview:	This subject lays the foundations for an understanding of the fundamental concepts of probability and statistics required for data analysis. Students should develop expertise in some of the statistical techniques commonly used in the design and analysis of experiments, and will gain experience in the use of a major statistical computing package. They should develop skills in collecting random samples, data description, basic statistical inference including parametric and nonparametric tests to compare population proportions and means, data manipulation and statistical computing. The methods will be illustrated using applications from science, engineering and commerce. Descriptive statistics, data manipulation and the implementation of the statistical procedures covered in lectures will be reinforced in the computer laboratory classes. Sampling; introduction to experimental design; review of simple probability; estimation; confidence intervals; hypothesis testing including types of errors and power; inferences about means and proportions based on single and independent samples; matched pairs designs; introduction to nonparametric methods; contingency tables; regression; and analysis of variance.
Objectives:	Students completing this subject should: # Understand the importance of random samples and experimental design in scientific research; # Understand some fundamental concepts of statistical inference relating to confidence intervals and hypothesis testing; # Use quantitative and graphical methods to describe a set of data; # Develop expertise in the use of some common statistical techniques; # Become familiar with a major statistical computing package.

Assessment:	Up to 25 pages of written assignments 10% (due during semester); two 45-minute computer laboratory tests 10% (held during semester); a 3-hour written examination 80% (held in the examination period).
Prescribed Texts:	J. M. Utts and R. F. Heckard, Mind on Statistics 3rd edn, Duxbury, USA, 2007.
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2009/D09)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2009/F04)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2009/A04)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2009/M05)** You should visit **learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)** and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	In addition to learning specific skills that will assist students in their future careers in science, they will have the opportunity to develop generic skills that will assist them in any future 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; and # computer skills: the ability to use an appropriate computing package.
Notes:	This subject is available for science credit to students enrolled in the BSc (both pre-2008 and new degrees), BASc or a combined BSc course.
Related Majors/Minors/ Specialisations:	First year mathematics and statistics Geomatics