MAST90085 Multivariate Statistical Techniques

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: Contact Hours: 36 hours comprising 2 one-hour lectures per week and 1 one-hour practice class per week. Total Time Commitment: Estimated Total Time Commitment - 170 hours
Prerequisites:	Both of **Subject** / **Study Period Commencement:** / **Credit Points:** MAST30025 Linear Statistical Models / Semester 1 / 12.50 MAST90082 Mathematical Statistics / Semester 1 / 12.50
Corequisites:	None
Recommended Background Knowledge:	**Subject** / **Study Period Commencement:** / **Credit Points:** MAST30027 Modern Applied Statistics / Semester 2 / 12.50
Non Allowed Subjects:	None
Core Participation Requirements:	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. 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
Coordinator:	Prof Richard Huggins
Contact:	Email: **r.huggins@ms.unimelb.edu.au (mailto:r.huggins@ms.unimelb.edu.au)**
Subject Overview:	Multivariate statistics concerns the analysis of collections of random variables that has general applications across the sciences and more recently in bioinformatics. It overlaps machine learning and data mining, and leads into functional data analysis. Here random vectors and matrices are introduced along with common multivariate distributions. Multivariate techniques for clustering, classification and data reduction are given. These include discriminant analysis and principal components. Classical multi-variate regression and analysis of variance methods are considered. These approaches are then extended to high dimensional data, such as that commonly encountered in bioinformatics, motivating the development of multiple hypothesis testing techniques. Finally, functional data is introduced.
Learning Outcomes:	After completing this subject students should gain: # a deeper understanding of the principles of statistical modelling and some of its important applications. # the ability to pursue further studies in this and related areas

Assessment:	Up to 40 pages of written assignments (two assignments worth 10% each) due mid and late semester (20%) Three hour written examination (80%)
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 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
Related Course(s):	Master of Philosophy - Engineering Master of Science (Mathematics and Statistics) Ph.D.- Engineering
Related Majors/Minors/ Specialisations:	Mathematics and Statistics