202-202 Experimental Design/Statistical Methods

Credit Points:	12.500
Level:	Undergraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: Thirty-six hours lectures of lectures, 24 hours of tutorials/practicals Total Time Commitment: Not available
Prerequisites:	620-081 Preliminary Mathematics A or 202-107 Mathematics for Land and Food Resources or VCE Mathematics Methods or equivalent.
Corequisites:	None
Recommended Background Knowledge:	None
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:	Dr Graham Hepworth
Subject Overview:	Upon completion of the subject, students should be able to: # understand and apply the basic concepts of study design, such as observational studies versus designed experiments, replication, randomisation, blocking and confounding, and recognise the effect of the design concepts on the interpretation of results; # recognise and apply experimental designs such as completely randomised, randomised block and Latin square designs; # construct and interpret appropriate graphs and tables for displaying and summarising data; # understand the basic concepts of statistical models such as estimation, predicted values, residuals, parameters and the normal distribution; # formulate, fit and interpret models involving one or two explanatory variables, which may be categorical, numerical, or one of each; # state the assumptions of simple models and use the data and residuals to check these assumptions; # understand the purposes and limitations of statistical inference, and use the main tools of inference, including measures of precision, confidence intervals, P-values, hypothesis tests and significance; and # use the statistical package Minitab to explore and analyse data, and interpret the output in terms of the original context of the data. Topics include:

	# types of variables; observational studies and designed experiments; replication, randomisation and blocking; displaying and summarising data; # statistical models - formulation, estimation, checking and inference; comparing and selecting models; analysis of variance; linear regression; # standard errors, confidence intervals and hypothesis tests; experimental designs - randomised blocks, Latin squares, incomplete blocks; ANOVA with two factors; interaction; and # residual plots; transformations; multiple regression; combining categorical and numerical explanatory variables; contingency tables.
Assessment:	A 3-hour final examination (65%), a one-hour mid-semester test (10%), assignments totalling up to 30 pages (25%).
Prescribed Texts:	None
Recommended Texts:	Information Not Available
Breadth Options:	This subject is a level 2 or level 3 subject and is not available to new generation degree students as a breadth option in 2008. This subject or an equivalent will be available as breadth in the future. Breadth subjects are currently being developed and these existing subject details can be used as guide to the type of options that might be available. 2009 subjects to be offered as breadth will be finalised before re-enrolment for 2009 starts in early October.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	Information Not Available
Related Course(s):	Bachelor of Agricultural Science Bachelor of Agricultural Science Bachelor of Agriculture and Bachelor of Commerce Bachelor of Animal Science and Management Bachelor of Food Science Bachelor of Forest Science Bachelor of Forest Science Bachelor of Natural Resource Management Bachelor of Natural Resource Management