



The University of Southern Queensland

## Course specification

This version produced 7 Jul 2008.

The current and official versions of the course specifications are available on the web at  
<<http://www.usq.edu.au/coursespecification/current>>.

Please consult the web for updates that may occur during the year.

### Description: Statistics for Researchers

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
STA	3302	62255	1, 2007	ONC	1.00	Toowoomba

<b>Academic group:</b>	FOSCI
<b>Academic org:</b>	FOS003
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	010103

### STAFFING

Examiner: Ashley Plank

### REQUISITES

Pre-requisite: STA2300

### RATIONALE

This course is aimed at, but is not restricted to, students enrolled in or planning to enrol in honours or graduate studies involving project or research work of a quantitative nature. In particular it targets students in Business, Commerce, Sciences, Engineering and Education. The course introduces a range of statistical techniques suitable for application to the analysis of research data and relevant to understanding statistical analyses reported in research literature. The course also prepares students for studying more advanced statistical methods as available in courses such as STA4302 Advanced Statistical Methods.

### SYNOPSIS

The course covers exploratory data analysis, data screening, parametric and nonparametric procedures, count data, measures of association and correlation, multiple regression and analysis of variance. A data-driven approach is adopted and extensive use made of computer software. Previous statistical knowledge to the level of STA2300 Data Analysis is assumed.

### OBJECTIVES

On successful completion of this course students should be able to:

1. make appropriate use of one or more statistical computer packages (Assignments 1 & 2, Exam);
2. select appropriate statistical tools to perform a range of exploratory and confirmatory analyses (Assignments 1 & 2, Exam);
3. screen data as appropriate to justify various inferential procedures (Assignments 1 & 2, Exam);

4. understand the differences between observational and experimental studies (Assignments 1 & 2, Exam);
5. interpret results of analyses in non-technical language (Assignments 1 & 2, Exam);
6. follow statistical arguments in reports, journal articles and presentations (Assignments 1 & 2, Exam).

## TOPICS

	Description	Weighting (%)
1.	Introduction to appropriate software. Creating, importing and exporting data files. File editing and manipulation. Data screening. Accuracy, missing values, data types, outliers, normality, linearity, homoscedasticity. Univariate and multivariate data. Transformations: suitability, implementation and interpretation. Exploratory Data Analysis. Appropriate graphical, tabular and numerical representation of data.	20.00
2.	Introductory inference. Significance testing and estimation. P-values. Statistical versus practical significance. Parametric versus nonparametric procedures.	15.00
3.	One and two-sample inference for location. Screening for assumptions. Robustness. Sample size determination.	15.00
4.	Bivariate relationships, correlations, associations. Chi-square analyses. Goodness of fit.	5.00
5.	Multiple regression. Analysis and interpretation. Modelling. Dummy variables. Residual analysis. Leverage. Influence. Multicollinearity. Selection methods. Robust methods.	20.00
6.	One-way analysis of variance. Screening for assumptions. Regression modelling. Interpretation. Planned and unplanned comparisons. Robustness considerations. Kruskal-Wallis Test.	15.00
7.	Multi-way analysis of variance. Interaction. Regression modelling.	10.00

## TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

## REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assessment	20.00
Examinations	3.00
Lectures	26.00
Private Study	90.00
Tutorials	26.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
ASSIGNMENT 1	20.00	20.00	05 Mar 2007 (see note 1)
ASSIGNMENT 2	20.00	20.00	05 Mar 2007
EXAM 2 HOUR RESTRICTED	60.00	60.00	END S1 (see note 2)

### NOTES

1. Assignment due dates will be provided by the Examiner at the commencement of semester.
2. Examination dates will be available during the Semester. Please refer to Examination timetable when published.

## IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:  
It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.
- 2 Requirements for students to complete each assessment item satisfactorily:  
To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available for each assessment item.
- 3 Penalties for late submission of required work:  
If students submit assignments after the due date without prior approval then a penalty of 10% of the total marks gained by the student for the assignment will apply for each working day late.
- 4 Requirements for student to be awarded a passing grade in the course:  
To be assured of receiving a passing grade a student must achieve at least 30% in all of the weighted assessment items, achieve at least 40% in the examination and at least 50% of the total weighted marks available for the course.

- 5 Method used to combine assessment results to attain final grade:  
The final grades for students will be assigned on the basis of the weighted aggregate of the marks obtained for each of the summative assessment items in the course.
- 6 Examination information:  
In a Restricted Examination, candidates are allowed access to specific materials during the examination. The only materials that candidates may use in the restricted examination for this course are: writing materials (non-electronic and free from material which could give the student an unfair advantage in the examination); calculators which cannot hold textual information (students must indicate on their examination paper the make and model of any calculator(s) they use during the examination). Students whose first language is not English, may, with the Examiner's approval, take an appropriate non- electronic translation dictionary into the examination. Students who wish to use a translation dictionary MUST request and receive written approval from the Examiner at least one week before the examination date. Translation dictionaries will be subject to perusal and may be removed from the candidate's possession until appropriate disciplinary action is completed if found to contain material that could give the candidate an unfair advantage.
- 7 Examination period when Deferred/Supplementary examinations will be held:  
Any Deferred or Supplementary examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.
- 8 University Regulations:  
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL <http://www.usq.edu.au/corporateservices/calendar/part5.htm> or in the current USQ Handbook.

## **ASSESSMENT NOTES**

- 9 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner. If requested, students will be required to provide a copy of assignments submitted for assessment purposes. Such copies should be despatched to USQ within 24 hours of receipt of a request being made. Students must retain a copy of each item submitted for assessment. The examiner may grant an extension of the due date of an assignment in extenuating circumstances.