



The University of Southern Queensland

Course Specification

Description: Statistical Inference

| Subject | Cat-Nbr | Class | Term | Mode | Units | Campus |
|---------|---------|-------|---------|------|-------|--------|
| STA | 2302 | 24394 | 2, 2003 | EXT | 1.00 | TWMBA |

| | |
|------------------------|--------|
| Academic Group: | FOSCI |
| Academic Org: | FOS003 |
| HECS Band: | 2 |
| ASCED Code: | 010103 |

STAFFING

Examiner: Shahjahan Khan

Moderator: Christine McDonald

PRE-REQUISITES

Pre-requisite: STA2301

RATIONALE

Methods of Statistical Inference are the basis of much decision making. A basic understanding of the concepts and techniques of statistical inference is highly desirable for a practitioner of statistics.

SYNOPSIS

This course provides the students with a firm grounding in the theory and methods of statistical inference and builds on the material covered in STA2301 Distribution Theory. Parametric and non-parametric applications are covered.

OBJECTIVES

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

- determine point and interval estimators for distributional parameters and discuss the properties and distributions of those estimators;
- understand the principles of hypothesis testing and power of a test;
- apply the principles of hypothesis testing to a wide range of situations including parametric and non-parametric testing;
- solve for and make inferences about the parameters of a linear model.

TOPICS

| Description | Weighting (%) |
|--|---------------|
| 1. Sampling Distributions chi-squared, t- and F- distributions | 10.00 |
| 2. Estimation properties of estimators, methods of maximum likelihood and moments, interval estimation, sample size determination | 20.00 |
| 3. Hypothesis Testing concepts, Type I and II errors, normal-based tests of proportions, means and variances, large and small samples, one and two samples, Neyman-Pearson Lemma, likelihood ratio tests | 20.00 |
| 4. Distribution-Free tests concepts, one and two sample tests of location, goodness-of-fit tests | 20.00 |
| 5. One-way analysis of variance Concept, F-test, Kruskal-Wallis test | 10.00 |
| 6. Regression the linear model, matrix approach to ordinary least squares, inference in the linear model. | 20.00 |

TEXT and MATERIALS required to be PURCHASED or ACCESSED:

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at <http://bookshop.usq.edu.au> by entering the author or title of the text.

Wackerly, D.D., Mendenhall, W. & Schaeffer, R.L 2002, *Mathematical Statistics with Applications*, 6th edition, Duxbury, Boston.

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.

Berry, D.A. & Lindgren, B.W 1996, *Statistics: Theory and Methods*, 2nd edition, Duxbury, Belmont.

Freund, J. E. & Walpole, R.E 1987, *Mathematical Statistics*, 4th edition, Prentice-Hall, Englewood Cliffs.

Larsen, R.J. & Marx, M.L 2001, *An Introduction to Mathematical Statistics and Its Applications*, 2nd edition, Prentice-Hall, Englewood Cliffs.

STUDENT WORKLOAD REQUIREMENTS

| ACTIVITY | HOURS |
|---------------|-------|
| Assessment | 40 |
| Examinations | 3 |
| Private Study | 125 |

ASSESSMENT DETAILS

| Description | Marks Out of | Wtg(%) | Required | Due Date |
|-----------------------------|--------------|--------|----------|-----------------------|
| ASSIGNMENT 1 | 8.00 | 8.00 | Y | 25 Aug 2003 |
| ASSIGNMENT 2 | 8.00 | 8.00 | Y | 19 Sep 2003 |
| ASSIGNMENT 3 | 8.00 | 8.00 | Y | 24 Oct 2003 |
| 3 HR RESTRICTED EXAMINATION | 76.00 | 76.00 | Y | END S2 (see note) |

NOTES:

Examination dates will be available during the Semester. Please refer to Examination timetable when published.

IMPORTANT ASSESSMENT INFORMATION

- Attendance requirements:**

There are no attendance requirements for this course. However, it is the students' responsibility 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.
- 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.
- 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.
- Requirements for student to be awarded a passing grade in the course:**

To be assured of a passing grade, students must demonstrate, via the summative assessment items, that they have achieved the required minimum standards in relation to the objectives of the course by obtaining at least 50% of the total weighted marks available for all summative assessment items.
- Method used to combine assessment results to attain final grade:**

The final grades for students will be assigned on the basis of the aggregate of the weighted marks obtained for each of the summative assessment items in the course.
- Examination information:**

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/SECARIAT/calendar/Part5/> or in the printed version of the current USQ Handbook.