The University of Southern Queensland

Course Specification

Description: Time Series						
Subject	Cat-Nbr	Class	Term	Mode	Units	Campus
STA	4304	25188	2, 2003	ONC	1.00	TWMBA

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

STAFFING

Examiner: Ron Addie
Moderator: Peter Dunn

RATIONALE

The analysis of discrete time series is performed for a variety of reasons: to identify the dominant interactions between the measured variables of a process; to model a process; to improve the control of a process; to forecast trends. Time series analysis has application to a wide variety of processes, including econometric, actuarial, commercial, industrial, agricultural, environmental, meteorological and medical processes.

SYNOPSIS

This course will consist of advanced studies in time series analysis for process identification and modelling. Topics will include: univariate and multivariate models of time series; forecasting algorithms; methods for model identification and parameter estimation; the spectral representation of a time series and non-linear forecasting methods.

OBJECTIVES

On completion of this course, students will be able to:

- understand the mathematical definition of a stationary time series (univariate and multivariate);
- identify the type of model to apply to a given time series by observing its autocovariance, partial autocovariance and periodogram;
- estimate the coefficients of a model of a time series with the assistance of a computer package and understand the mathematics on which the computer package is based.
- interpret diagnostic tests on the fit of a model to data;
- understand how to use a time series model for forecasting or prediction of the behaviour of a system;

- understand how to apply non-linear modelling methods such as the nearest neighbour method, radial basis functions and spline fitting;
- understand the use of bootstrap methods for generation of confidence intervals & other statistical estimates
- understand the concept of long-range dependent time series and their applications.

TOPICS

Description	Weighting (%)
1. Models of stationary multivariate time series	15.00
2. Forecasting formulae for multivariate time series	15.00
3. System identification and parameter estimation techniques	15.00
4. Diagnostic tests	15.00
5. Non-linear and non-parametric time series modelling and forecasting methods.	40.00

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.

Box, G.E.P., Jenkins, G.M. & Reinsel, G.C 1994, *Time Series Analysis Forecasting and Control*, 3rd edition, Prentice Hall, New Jersey.

Brockwell, P.J. & Davis, R.A 1991, *Time Series: Theory & Methods*, 2nd edition, Springer-Verlag, New York.

Hamilton, J.D 1994, *Time Series Analysis*, Princeton University Press, Princeton.

Weigend, A.S. & Gershenfeld, N.A. (eds.) 1994, *NATO Advanced Research Workshop on Comparative Time Series Analysis Time Series Prediction*, Addison Wesley, Reading, M.A.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assessment	40
Directed Study	40
Lectures	30
Private Study	40
Tutorial	15

ASSESSMENT DETAILS

Description	Marks Out of	Wtg(%)	Required	Due Date
ASSIGNMENT 1	20.00	20.00	Y	22 Jul 2003
ASSIGNMENT 2	20.00	20.00	Y	22 Jul 2003
ASSIGNMENT 3	20.00	20.00	Y	23 Jul 2003
ASSIGNMENT 4	40.00	40.00	Y	23 Jul 2003

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 assignments satisfactorily, students must obtain at least 50% of the marks available for each assignment.

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 50% of the available weighted marks for the summative assessment items.

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 Closed Examination, candidates are allowed to bring only writing and drawing instruments into the examination.

7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during the next examination period.

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.

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. Students must retain a copy of each item submitted for assessment. 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. This must be produced within five days if required by the Examiner. The examiner may grant an extension of the due date of an assignment in extenuating circumstances.

10 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded the temporary grade: IM (Incomplete - Make up). An IM grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non directed personal study.

11 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination; IDM (Incomplete Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred Make-up).