DESCRIPTION OF THE COURSE

Modern economists, functioning in the emerging global environment (an environment in which information is a competitive resource) are expected to have a varied toolkit of techniques to provide relevant economic analysis and forecasts to both the private and public sectors. The development of this toolkit requires both a sound grasp of the theory and application of statistical methods. This course is intended as an introduction to the theory of statistics (building on the knowledge gained at the first year level) but will furnish the student with the fundamentals to attempt more advanced work.

The course is divided into three (3) parts.

1. A diagnostic assessment to be done by students within one (1) day of the start of the semester.

2. Part A which focuses mainly on theoretical concepts; some emphasis will be given to practical applications. It introduces students to topics that will normally be covered in an introductory course in Mathematical Statistics.

3. Part B which covers topics that every economist or economic statistician will encounter on a routine basis in the world of work.

Pre-Requisites:

- EC10D [ECON 1000]
- EC10F [ECON 1002]
- EC141 [ECON 1003] and
- EC160 [ECON 1005] or a good pass in A-Level or CAPE Mathematics with Statistics or CAPE Statistics

The course assumes some competence with basic computing and students will be expected to conduct exercises involving the use of MINITAB.

Students writing this course for the first time must complete the solutions to all questions on the April 2009 Examination Paper in ECON1005 as a diagnostic and submit same by Monday 08 September 2009. Copies of the examination paper will be made available at the Economics Office.
Students who are not writing this course for the first time must complete the Summer 2009 Examination Paper in ECON2006 as a diagnostic and submit same by Monday 08 September 2009. Copies of the examination paper will be made available at the Economics Office.

LECTURES AND TUTORIALS

Lectures: two (2) hours per week
Tutorials: One (1) hour per week
Attendance at Lectures and Tutorials is mandatory.

ASSESSMENT

Assessment Objectives:

Assessment will take the form of Coursework and a Final Examination. The assessment will test the ability of the students to:

a. demonstrate an understanding of basic statistical concepts.
b. apply basic statistical concepts to practical situations.
c. recognise the appropriate statistical technique for a given situation and apply same in the context of economic analysis and forecasting.

The Final Mark will therefore be a composite of the marks obtained in coursework and the final examination:

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<th>Coursework</th>
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<td>Final Examination</td>
<td>80%</td>
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Coursework:

Coursework will be comprised of tutorial assignments, one mid term examination and a mini project.

- The diagnostic paper which will count for 1%.
- The mid term examination accounts for 10% maximum and is designed to assess students in all topics that comprise Part A of the course.
- The mini project (accounts for 5% maximum) will be based on topics covered in Part B of the course. Topics will be assigned in Week #3; Literature Review must be submitted by Week #7; Datasets and analysis must be submitted in Week #12.
- Tutorial Participation will be based on attendance and contribution to the discussion on solutions to the assignments; it will account for a maximum of 4%.
The Final Examination:

At the end of the course of lectures, there will be a written examination. This paper will be divided into four (4) sections viz. Probability Distributions, Estimation, Multivariate Regression and the remaining topics that comprise Part B of the course content. Some or all of the questions in each section of the examination may be compulsory.

COURSE CONTENT

PART A

I. THE NATURE AND SCOPE OF STATISTICS AND REVIEW OF STATISTICAL CONCEPTS

Meaning of Statistics; Stages of Statistical Investigation: Statistical Definition of the Decision Problem: Populations, Elementary Units and Observations; Measurement of Elementary Units; Specifying Parameters; Sample Space; Axioms of Probability; Random Variables- Discrete and Continuous; Statistical Dependence and Independence; Marginal and Conditional Probability; Permutations and Combinations, Chebychev's Inequality.

References: Keller & Warrack or Mann for discussion of the concepts and Rothenberg for further discussion, illustrations and solved examples.

II. FUNDAMENTALS OF PROBABILITY THEORY AND PROBABILITY DISTRIBUTIONS

Discrete and Continuous Probability Distributions; Cumulative Distribution Functions; Moments of a Distribution; Mathematical Expectation; Marginal and Conditional Distributions; Density Functions of well known distributions: - Bernoulli, Binomial, Poisson, Uniform, and Normal.

References: Keller & Warrack or Mann for discussion of the concepts, Rothenberg for further discussion, illustrations and solved examples. Paulson/Bellhouse for some interesting applications to lotteries.

III. STATISTICAL INFERENCE

Random Samples and Sampling Distributions; Sample Moments; $\chi^2$, Student-t and F distributions; Central Limit Theorem.

Point and Interval Estimation; Confidence Intervals; Maximum likelihood Estimation; Properties of Estimators: - Unbiasedness, Efficiency, Consistency, Sufficiency.

The notion of a statistical test; Tests of Simple and Composite Hypotheses; Tests of Means, Variances, Proportions, Difference of Means.

References: Walpole Chaps 8, 9 and 10, Keller & Warrack or Mann for discussion of the concepts for statistical concepts and Tanis/Rothenberg for further discussion, illustrations and solved examples.
PART B

I. DATABASE MANAGEMENT AND DATA DEFICIENCY PROBLEMS

Definition and Importance of Data; The Data Cycle; Data Deficient Problems (i.e. Missing Observations, Short Samples, Insufficient Periodicity).


II. SURVEY METHODOLOGY AND ANALYSIS OF VARIANCE

The Process of Sampling; Survey Design and Implementation; Sampling Methods (i.e. Simple Random Sampling, Cluster Sampling, Stratified Random Sampling, Multi Stage Sampling); Contingency Table Analysis; Analysis of Variance (Completely Randomized One-way and Two-way Models); Link between Regression Analysis and ANOVA.


III. INTRODUCTION TO ECONOMETRICS

Simple Regression Analysis; Multiple Regression Analysis


IV. TIME SERIES AND FORECASTING METHODS

Simple Exponential Smoothing; Double Exponential Smoothing; Moving Averages; Seasonality and Seasonal Adjustment of Economic Time Series (Ratio to Moving Averages).


LECTURE PLAN

Week 1  Part A – I
Week 2  Part A – II; Assignment of Mini Projects
Week 3  Part A - II;
Week 4  Part A – III;
Week 5  Part A – III;
Week 6  Part B – I;
Week 7  Part B – II;
Week 8  Part B – III; Coursework Examination
Week 9  Part B – III;
ASSIGNMENTS

Week 10  Part B – IV;
Week 11  Part B – IV;
Week 12  Project Submissions

READING LIST

_Probability and Statistical Inference_


Survey Methodology
Abdulah N. (1986): **Designing Social Surveys in the Caribbean**, St. Augustine ISER*** HN 29T8 A136 D4


**Database Management and Data Deficiency**


**Introduction to Econometrics**


Shelton Nicholls, Hyginus Leon and Patrick Watson (eds) Problems and Challenges in Modelling and Forecasting Caribbean Economies, St. Augustine: Caribbean Centre for Monetary Studies (CCMS).***


**Time Series and Forecasting Methods**


Clarke C. and M. Francis (1996) “Seasonal Adjustment Systems for Practitioners in the Caribbean: Lessons from the Trinidad and Tobago Experience” in Shelton Nicholls, Hyginus Leon and Patrick Watson (eds) Problems and Challenges in Modelling and Forecasting Caribbean Economies, St. Augustine:
Caribbean Centre for Monetary Studies (CCMS).***  

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LECTURER'S CONTACT:

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August 2009