

MS4504: STATISTICS FOR ECONOMIC AND FINANCIAL MODELLING

Effective Term

Semester B 2024/25

Part I Course Overview

Course Title

Statistics for Economic and Financial Modelling

Subject Code

MS - Department of Decision Analytics and Operations

Course Number

4504

Academic Unit

Department of Decision Analytics and Operations (DAOS)

College/School

College of Business (CB)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

CB2200 Business Statistics

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course aims to:

- Provide students with a solid understanding of the range of statistical modelling techniques used in economic and financial analysis; Special emphasis is placed on the analysis of economic and financial data;
- Demonstrate the relevance of these statistical modelling techniques through examples and case studies;
- Acquaint students with the necessary computing knowledge to execute the analysis;

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Apply the statistical modelling techniques learnt in the course to solve real world problems in economics and finance			x	x
2	Select the most appropriate statistical modelling techniques for a given problem		x	x	
3	Evaluate the validity of the statistical modelling findings		x	x	
4	Appreciate the relevance of statistics in economics and finance			x	
5	Understand the basic operations of financial markets and apply such knowledge in investment and in making other financial decisions			x	

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture / Tutorial	Presents theories and software demonstrations to a large group	1, 2, 3, 4, 5	
2	Computer laboratory	Software demonstrations, computer assignments	1, 2, 3, 4, 5	
3	Group discussions	Group discussions on major issues in class	1, 2, 3, 4, 5	
4	Reading assignments	Students are assigned to read selected pages of compulsory and additional texts	2, 3, 4, 5	

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Computer assignment / problem set Students work individually or in small groups to analyse real-world data set(s) using a software taught in lectures.	1, 2, 3, 4	20	
2	Test The test is designed to assess students' knowledge of selecting and applying the most suitable statistical technique to solve real-world problems.	1, 2, 3, 5	20	

Continuous Assessment (%)

40

Examination (%)

60

Examination Duration (Hours)

2

Additional Information for ATs

Examination The exam is designed to assess students' knowledge of selecting and applying different statistical methods to solve problems. Computer output may be used for students' interpretation.

Assessment Rubrics (AR)**Assessment Task**

Computer assignment / problem set

Criterion

RECOGNIZE the most appropriate model to model a data set and INTERPRET software printouts

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal level

Assessment Task

Test

Criterion

GRASP of subject and UNDERSTANDING of course materials

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal level

Assessment Task

Written Examination

Criterion

Capacity to ANALYZE and ORGANISE ; and GRASP of subject material

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal level

Part III Other Information

Keyword Syllabus

Regression Analysis

Least squares estimates; inference about regression parameters; residual analysis

Model Building and Variables Selection

Criteria for comparing models; sequential F-test; variables selection strategies

Forecasting Methods

Moving averages; exponential smoothing; models for seasonal data

Time Series Analysis

Stationarity of time series; autocorrelations and partial autocorrelations; ARIMA models

Selected Advanced Topics

Transfer function models / intervention analysis / cointegration / ARCH & GARCH models / option pricing models

Reading List**Compulsory Readings**

Title	
1	Dielman, T.E. Applied Regression Analysis for Business and Economics, Duxbury, latest edition
2	Bowerman, B.L. and R.T. O'Connell, Forecasting and Time Series: An Applied Approach, Duxbury, latest edition

Additional Readings

Title	
1	Brooks, C. Introductory Econometrics for Finance, Cambridge, latest edition
2	DeLurgio, S.A., Forecasting Principles and Applications, McGraw-Hill, latest edition
3	Pindyck, R.S. and K.L. Rubinfeld, Econometric Models and Economic Forecasts, McGraw-Hill, latest edition
4	Watsham, T.J. and K. Parramore, Quantitative Analysis in Finance, Thomson Publishing Asia, latest edition