FB5731: BUSINESS ANALYTICS AND DECISION MODELLING

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Business Analytics and Decision Modelling

Subject Code
FB - College of Business (FB)
Course Number
5731

Academic Unit
Decision Analytics and Operations (DAOS)

College/School
College of Business (CB)

Course Duration
One Semester

Credit Units
2

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
MS5731 Quantitative Methods (From the old curriculum)

Part II Course Details

Abstract

This course aims to:

- Provide students with the key concepts, knowledge, and tools to use data, analytical models and information technology to support practical managerial decision-making
- Develop students' basic skills and hands-on experiences to uncover useful information and solve real business problems by analyzing the complex data sets, and to derive the best possible decisions to gain a company competitive advantages and enhanced capabilities in better dealing one' daily business decisions
- Expose students to the best practices and successful stories of how management science or quantitative methods has generated significant business values and competitive advantages for organizations

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Discuss basic knowledge in the concepts, principles and benefits of some most widely used management science techniques and their applications	30			x
2	Apply some basic management science tools of data analysis, modelling and information technologies to solve and to analyze some real managerial decision-making problems	30		x	x
3	Demonstrate the evaluation of the managerial applications of some basic quantitative methods	20		x	x
4	Explain the analytical results and solutions to non-quantitative managers and practitioners	20	x	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	Student will identify the concepts and general knowledge of logistics and supply chain operations and the applications of management science techniques in logistics and supply chain decision analysis	1, 2, 3, 4	

2	Lab sessions	Students will demonstrate hands-on exercises using computer software, such as Microsoft Excel, to solve managerial decision-making problems by applying learnt quantitative techniques.	1, 2, 3, 4	
3	Tutorials	Students will describe real case analyses and discussions, elaborating on how these cases provide practical insights and real-world applications of theoretical concepts.	1, 2, 3, 4	
4	Reading	Students will critically engage with the Supplemental reading materials on successful stories and industrial practices.	1, 2, 3, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Course Assignments	1, 2, 3, 4	50	GenAI can be used for reference, but you need to finish the assignments by yourself	Yes
2	Class Participation	1, 2, 3, 4	10	You are encouraged to use GenAI in class	Yes

Continuous Assessment (%)

60

Examination (%)

40

Examination Duration (Hours)

3

Additional Information for ATs

Examination: 40% (take home and /or duration: 3 hours, if applicable)

Assessment Rubrics (AR)

Assessment Task

Course Assignments (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Understanding the concepts and methods of some most widely used management science techniques and their applications

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Class Participation (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Contribution through readings, in-class exercises, and active and insightful class participation. Punctual and nearly full attendance

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Written Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
Capability to solve the problems, and with clear key points covered for open-end questions

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Course Assignments (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Understanding the concepts and methods of some most widely used management science techniques and their applications

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate

Failure
(F) Not even reaching marginal levels

Assessment Task
Class Participation (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
Contribution through readings, in-class exercises, and active and insightful class participation. Punctual and nearly full attendance

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate

Failure
(F) Not even reaching marginal levels

Assessment Task
Written Examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Capability to solve the problems, and with clear key points covered for open-end questions

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Moderate

Failure

(F) Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Introduction to Modelling and Management Science
Modelling for Managerial Decisions. Quantitative vs. qualitative Problem Solving Process. Use and Implementation of Modelling

Basic Concepts in Probability and Statistics
Expected Values. Standard Deviation. Normal Distribution. Concepts of Sampling. Estimation and Confidence Intervals. Data analysis using Excel

Regression Analysis
Simple Linear Regression models. Estimation and prediction suing regression method. Interpretation of regression parameters and coefficient of correlation.

Introduction to Data Mining
Predictive models. Cluster analysis. Market basket analysis.

Constrained Optimization techniques
Optimization modelling. Linear Programming formulation. Using Excel Solver to solve constrained optimization problem. Other constraint optimization models (including Integer and Non-linear programming problems) and their applications.

Multiple Objective Decision Making Techniques
Multiple objective decision problems and decision making tools. The Analytical Hierarchy Process.

Simulation Modelling and Analysis
Simulation concepts and modelling. Excel simulation and managerial applications

Implementation Issues
Success, challenges and issues in quantitative managerial decision support. Uses and abuses of quantitative results in real-Life situations. Strengths and limitations of quantitative models.

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	S. Christian Albright, Wayne Winston, Christopher Zappe, Data Analysis and Decision Making with Microsoft(R) Excel, Revised, 3rd Edition, ISBN-10: 0324662440, ISBN-13: 9780324662443, (C) 2009
2	Cliff Ragsdale, Spreadsheet Modeling & Decision Analysis: A Practical Introduction to Management Science, Revised, 5th Edition, Virginia Polytechnic Institute and State University ISBN-10: 0324656637 ISBN-13: 9780324656633 (C) 2008
3	Taylor, B W, Introductory Management Science, 8/e (2004, Prentice Hall)
4	Levine, D M, Stephan, D, Krehbiel, T C and Berenson, M L: Statistics for Managers, 4/e (2005, Prentice Hall)
5	Wisniewski, M: Quantitative Methods for Decision Makers, 3/e (2002, Prentice Hall)
6	www.informs.org