



University of Management and Technology

COURSE OUTLINE: DATA MODELING & DECISIONS - OS 565

Resource Person:	Kamran Rashid
Email:	kamranrashid@umt.edu.pk
Contact Hours:	
Office Address:	Room 3N-02, North Block, Main Building Extension: 3347
Programme:	MBA
Section:	G
Semester:	Spring 2023
Course Pre-requisites:	Quantitative Techniques for Management
Credit Hours:	3
Course Type:	Core
Venue/Day/Time:	MC-02 / Monday 6:30 PM – 09:15 PM
Course URL (if any):	https://lms.umt.edu.pk/course/view.php?id=18744

Course Description:

A major function of a business manager or an entrepreneur is to make decisions. Success of the organisation or business depends heavily on soundness of these decisions. Quantitative methods have always played an important role in enhancing the soundness. However, with recent development in information technology, the role of quantitative techniques in decision making has increased manifold. More and more managers are using such techniques to complement their experience and expertise in business world.

This course is aimed to provide the necessary tools to managers and entrepreneurs for decision making in variety of business situations. Participants will learn to formulate the real life business problems into quantitative models. Teaching of conceptual framework of these tools will be supplemented by hands on application of various software packages that will aide in solving these models. Expertise will be developed in interpretation of these solutions and their use in decision making.



University of Management and Technology

Course Teaching Methodology:
<ul style="list-style-type: none"> • Interactive class discussions • Case studies • Presentations • Business Simulation Games • Role Playing • Guest Speaker sessions • Video cases • Skill Development Exercises

MBA Mission

‘Our mission is to transform students into visionary leaders, managers, and entrepreneurs who are sensitive to corporate social responsibility, business ethics, and global sustainability challenges.’

Program Objectives/Goals		Program Learning Outcomes
PO1	To inculcate reasoning, critical, analytical, problem-solving, and decision-making skills.	PLO1, PLO3, PLO5
PO2	To provide real-life work experiences.	PLO2, PLO4, PLO5, CLO7
PO3	To provide opportunities to network with employers and entrepreneurs.	PLO4, PLO7
PO4	To develop future leaders, managers, and entrepreneurs for the digital and globalized world.	PLO1, PLO2, PLO6,
PO5	To develop effective presentation, oral, and written communication skills.	PLO2, PLO4, PLO6
PO6	To expose students to the important social, environmental, economic and ethical issues.	PLO1, PLO3

Program Learning Outcomes (PLOs): MBA	
After completing this degree program, students shall be able to:	
PLO1	Critically analyze complex business situations and make appropriate decisions.
PLO2	Successfully negotiate with the challenging work demands.
PLO3	Apply organizational theories, models, and frameworks to the real-world business situations to solve managerial issues.
PLO4	Communicate effectively and efficiently, and deliver professional business presentations.
PLO5	Analyze and evaluate market opportunities and develop viable business plans.
PLO6	Use digital technologies and data analytics tools to make informed decisions.
PLO7	Undertake industry-based projects through interaction with business leaders and entrepreneurs.

University of Management and Technology

Course Learning Outcomes (CLOs): After completing this course, students shall be able to:		
		Mapping the CLOs with PLOs
CLO-1	Appreciate the important role that the data-driven quantitative models play in decision making in today's business world	PLO-1,4
CLO-2	Describe real life business situations by appropriate quantitative models	PLO-3,6
CLO-3	Solve and interpret these models using state-of-the-art technology tools for effective decision making	PLO-1,6
CLO-4	Incorporate the issues of environmental and social sustainability of business operations in decision making	PLO-2,5
CLO-5	Identify and resolve ethical issues in decision making	PLO-5

Assurance of Learning and Assessment Items: <i>Specify Assessment Items that will ensure student learning through application and achieve objectives of specific PLOs/COs/CLOs</i>	
Assessment Item	Application/ Objectives PLO/CO/CLO
Class Participation	CLO 1,2,3,4,5
Presentations	CLO 1
Quiz	CLO 2,3
Assignments	CLO 2,3,5
Written Analysis of the Case (WAC)	CLO 1,2,4,5
Short Tests	CLO 1,2,3,4,5

University of Management and Technology

<u>Assessment Structure and Grading Policy</u>		
Assessment Item	Weight (%)	Execution Plan
Class Participation	10	Students marked based on their contribution to class learning
Presentations	10	Students make formal presentations on assigned topics
Assignments	10	Take-home Individual and Group assignments
Written Analysis of the Case (WAC)	10	Take-home (Group) task
Quiz	20	Open Book / Open Notes
Short Tests (2)	40	Case-based, Open Book / Open Notes
Total =	100	

Notes – Norms and Important Class Policies:

Class Policy:

You are required to be in class at the assigned time. If you arrive more than ten minutes late, you will be marked absent.

Mobile Policy:

Switch off your mobile phones while in class.

Email Policy:

You will be responsible if you miss a deadline because you did not read your email. Participants should regularly check their University email account.

Class Attendance Policy:

A minimum 80% attendance is required for a participant to be eligible to sit in the final examination. Reporting sick and attending family functions (such as a wedding) will be considered as absent. Participants with less than 80% attendance in a course will be given grade 'F' (Fail) and will not be allowed to take the final exam. An 'F' grade will negatively impact student's CGPA.

Withdrawal Policy:

Students may withdraw from a course till the end of the 12th week of the semester. In such a case, a grade 'W' will be awarded. A 'W' grade will not impact student's CGPA. A student withdrawing after the 12th week will be awarded 'F' grade, which will negatively impact CGPA.

Harassment Policy:

Sexual or any other form of harassment through physical, verbal or electronic (mobile, email, etc.) means is constituted as punishable offence. Such actions will not be tolerated.

Use of Unfair Means/Honesty Policy:

Any participant found using unfair means or assisting another participant during a class test, quiz, assignment, examination, etc. will be liable for strict disciplinary action.

Plagiarism Policy:

Plagiarism is defined as the practice of taking someone else's work or ideas and passing them off as

University of Management and Technology

one's own. The participants will submit the plagiarism report to the resource person with every assignment, report, project, thesis, etc. A participant who fails to submit the 'Turnitin' report will receive 'F' grade that will count towards CGPA. If participants attempt to cheat 'Turnitin,' they will receive an additional 'F' that will count towards their CGPA. Look up the Student Handbook for further information on rules and regulations regarding plagiarism while submitting final report and other documents.

NOTE: **STUDENTS ARE REQUIRED TO READ AND UNDERSTAND ALL ITEMS OUTLINED IN THE STUDENT HANDBOOK.**

Weekly Sessions Plan:

<u>Week</u>	<u>Topics / Contents</u>	<u>Activity</u>	<u>Relevant CLO</u>
1.	Introduction to Quantitative Models for Decision Making, Comparison of Quantitative and Qualitative Approaches of Decision Making, Good Decisions vs Good Outcomes Types of Decision Models (Prescriptive, Predictive, Descriptive)	Interactive Class Discussion	CLO-1,2
2.	Introduction to Optimization Modeling , Constrained Optimization Models Fundamentals of Linear Programming (LP) Components of a Linear Program (Decision Variables, Objective Function, Constraints)	Interactive Class Discussion Hands-on Exercises Role Play	CLO-1,2,4,5
3.	LP Formulations (Product-Mix, Blending, Scheduling, Financial Planning)	Interactive Class Discussion Presentation Case Study Hands-on Exercises	CLO-1,2
4.	Computer Modeling and Solutions of LP	Interactive Class Discussion Presentation Hands-on Exercises	CLO-1,2,4
5.	Sensitivity Analysis , Post Optimality Analysis	Interactive Class Discussion Hands-on Exercises Presentation	CLO-1,4,5
6.	LP Applications (Transportation, Assignment, Network Problems, Aggregate Planning)	Interactive Class Discussion Case Study Hands-on Exercises	CLO-1,2
7.	Integer Programming (IP) Models, Use of Binary Variables in IP Models	Interactive Class Discussion Presentation Hands-on Exercises	CLO-2

University of Management and Technology

8.	SHORT-TEST – 1		
9.	Introduction to Forecasting , Time Series Forecasting Models, Exponential Smoothing	Interactive Class Discussion Hands-on Exercises	CLO-3
10.	Measuring Forecasting Errors Forecast Bias, MAD, RMSE	Interactive Class Discussion Case Study Hands-on Exercises	CLO-3
11.	Causal Methods of Forecasting, Regression Analysis	Interactive Class Discussion Hands-on Exercises	CLO-3
12.	Decision Making under Uncertainty, Pessimistic and Optimistic Approaches, Expected Monetary Value (EMV), Decision Trees (Construction & Solution)	Interactive Class Discussion Case Study Hands-on Exercises	CLO-2,5
13.	Guest Speaker Session		CLO-1,4,5
14.	Decision making for making businesses Environmentally and Socially sustainable Ethical considerations of decision making	<i>Documentary</i>	CLO-4,5
15.	SHORT TEST-2		

Primary Text Book (s):

Spreadsheet Modeling & Decision Analysis (by Ragsdale) 8th Ed

Reference / Supplementary Reading(s):

- Data Analysis & Decision Making (by Albright, Winston, Zappe) 3rd Ed
- Quantitative Analysis for Management (by Render, Stair, Hanna) 9th Edition)
- Business Statistics (by Groebner)

Useful Online / Web Resources:

<https://www.informs.org/>
<https://www.coursera.org/learn/decision-making>
<https://www.driveresearch.com/market-research-company-blog/data-driven-decision-making-ddm/>
<https://www.forbes.com/sites/tableau/2022/09/23/beyond-the-buzzword-what-does-data-driven-decision-making-really-mean/?sh=793fe01525d6>
<https://online.hbs.edu/blog/post/data-driven-decision-making>