MIDDLE EAST TECHNICAL UNIVERSITY SPRING 2025
DEPARTMENT OF BUSINESS ADMINISTRATION

BA 3504 / BAS 352 – Management Science
Monday & Wednesday 9.00 - 10.15 @G110

Instructor:	Dr. Gülşah Karakaya
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Office Hours:	Tuesday: 14.00-15.00
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Course Web Page:	https://odtuclass.metu.edu.tr

Course Description:

Management science deals with the presentation and conversion of real-life problems into quantitative models. Through these quantitative models, we can apply mathematical/statistical techniques and attain recommendations about the solution of the problem. In turn, by interpreting these recommendations, we gain insight and guidance about how to overcome that problem. Management science serves as an important consultant for real-life managerial decision making.

Management science has a sophisticated mathematical and statistical background underlying its models and tools. However, having a managerial perspective, we will not dive so much into this theory, but remain highly on the application side. We will define a problem, construct its model and feed it into the computer. Then we will let the computer solve the problem.

Course Student Learning Objectives: (CSLO)

Upon successful completion of this course, students should be able to:

Course Specific Skills:

1. Attain an understanding on the basic theories of management science/quantitative modeling/operations research
2. Develop the analytical and critical thinking skills to model a business/management problem
3. Understand how to define the decision variables from problem statements
4. Understand how to construct the appropriate mathematical models from problem statements
5. Understand the concepts of linear programming models and its derivatives such as integer programming and goal-programming
6. Develop skills to solve the management science models using computer programs
7. Understand how to interpret the solutions of the mathematical models

Discipline Specific Skills:

8. Recognize how mathematical modeling is useful in making managerial decisions
9. Understand the concepts of modeling and sensitivity analysis

Personal and Key Skills:

10. Develop problem solving skills
11. Learn to apply the abstract concepts learned in the classroom to everyday decisions made by people and organizations

Learning and Teaching Methods:

This course is going to make use of formal lectures, in-class discussions and problem solving, and written homework assignments.

Required Reading:

Managerial Decision Modeling with Spreadsheets, 3rd Edition, Balakrishnan, Render & Stair, Pearson, 2013.

Suggested Reading:

Introduction to Management Science with Student CD, 4th Edition, Frederick S. Hillier, Mark S. Hillier, McGraw-Hill Publications. 2008.
Quantitative Analysis for Management, 10th Edition, Render, Stair & Hanna, Pearson-Prentice Hall, Inc., 2009.

Assessment and Grading (tentative):

There will be two midterms and a final examination. The exams will consist of problems of model construction, true/false questions, multiple choice questions, and computer output interpretation. Tentative weights for these will be:

Form of Assessment	% Contribution	Size of the assessment	CSLOs covered by the assessment	Feedback Method
Midterm 1	25	Individual, 75-min exam	1-8,10-11	Written
Midterm 2	28	Individual, 75-min exam	1-11	Written
Final	30	Individual, 75-min exam	1-11	Written
In-class exercises, quizzes, etc.	12	Homework problems, in-class polls	1-11	Written and oral
Attendance, participation	5	Class participation during lectures	1-11	Oral

Course Policies:

Attendance and Participation: Students are expected to attend the lectures and be active in the discussions.

Missed Exams: In case you cannot attend one of the examinations and have a valid excuse, you will be eligible to take a make-up examination. There will be one **single**, **comprehensive** and **detailed** make-up examination during the final period and it will be counted towards whichever exam(s) you are missing.

Late Submission Policy: Late submissions will **not** be accepted.

STUDENT DISABILITIES: Any student, who, because of a disabling condition, may require special arrangements in order to meet course requirements, should contact the instructor as soon as possible. Students should present the appropriate documentation from the university's Disability Support Office (Engelsiz ODTÜ Birimi, ODTÜ Kütüphanesi, Solmaz İzdemir Salonu, Tel: 210.7196; engelsiz@metu.edu.tr) verifying their disability, and outlining the special arrangements required. Please note that no accommodations will be provided to the disabled students prior to the completion of this approved University process.

ACADEMIC DISHONESTY: The Department of Business Administration has no tolerance for acts of academic dishonesty. Such acts damage the reputation of METU, the department and the MBA

degree and demean the honest efforts of the majority of the students. The minimum penalty for an act of academic dishonesty will be a zero for that assignment or exam.

CHEATING: All university, faculty/institute, and department principles on academic honesty will be strictly enforced. The usual consequence for academic dishonesty is failure of the course and referral of the case to the Dean of the Faculty for additional disciplinary action. Examinations are individual and are to be completed without outside assistance of any sort. Persons observed cheating during examinations will receive a failing grade in the course. Homework assignments are individual, unless otherwise specified by the instructor, and are to be completed without outside assistance of any sort, as well. Persons observed cheating in their homework assignments will receive a score of zero for the portion of the semester grade that is allocated to such assignments.

PLAGIARISM: The instructor assumes that students will do their own work. By placing their names on assignments (individual or team), students are affirming that the contents are their original work. Any previous work available from files or past students, as well as materials available on the internet may be used only as a suggestive model. Violation of this provision will be considered as unethical behavior, subject to disciplinary action. If you have any doubt about the use of a specific material, see the instructor ahead of time. Any material used from outside sources should be referenced appropriately. Persons observed to plagiarize while preparing assignments will be referred to the Dean of the Faculty for additional disciplinary action and also they will receive a score of zero for the portion of the semester grade that is allocated to such assignments.

METU HONOR CODE

Every member of METU community adopts the following honor code as one of the core principles of academic life and strives to develop an academic environment where continuous adherence to this code is promoted.

"The members of the METU community are reliable, responsible and honorable people who embrace only the success and recognition they deserve, and act with integrity in their use, evaluation and presentation of facts, data and documents."

CIVILITY: Students are expected to assist in maintaining a course environment which is conducive to learning. Inappropriate behavior in course setting (online/offline) shall result, minimally, in a request to leave the setting.

KNOW YOUR RIGHTS AND RESPONSIBILITIES! http://oidb.metu.edu.tr/en/academic-rules-and-regulations

NOTE THE IMPORTANT DATES ON THE ACADEMIC CALENDAR! http://oidb.metu.edu.tr/en/academic-calendar

Good luck ☺

The following table gives the tentative schedule for the semester and is subject to change.

Tentative Course Schedule				
Month	Day	Topic	Reading/ Assignment	CSLO
February	17	Introduction		
	19-24	Managerial decision modeling	Chapter 1	1,2,8
	26	Linear Programming (LP)	Chapter 2	1-5
March	3	Graphical method	Chapter 2	1-5
	5	Interpretation of solution	Chapter 2	1-5,7
	10	Special situations in LP	Chapter 2	1,5
	12	Spreadsheet modeling	Chapter 3	1-6
	17	Interpretation of Excel solution report	Chapter 3	1-6,7
	19-24	LP applications	Chapter 3	1-8,10-11
	26	Review		
	26	Midterm 1 @TBA	All so far	1-8,10-11
	31	Religious holiday		
April	2	Transportation, transhipment models	Chapter 5	1-8,10-11
	7	Assignment, maximal-flow models	Chapter 5	1-8,10-11
	9	Shortest-path, minimal-spanning tree	Chapter 5	1-8,10-11
	14	Sensitivity analysis	Chapter 4	1-11
	16	Changes in objective function/constraints	Chapter 4	1-11
	21	Interpretation of Excel sensitivity report	Chapter 4	1-11
	23	National holiday		
	28	Simultaneous changes	Chapter 4	1-11
	30	Sensitivity analysis - examples	Chapter 4	1-11
May	5	Review		
	6	Midterm 2 @TBA	All after Midterm 1	1-11
	7-12	Integer Programming	Chapter 6	1-8,10-11
	14	Goal Programming	Chapter 6	1-8,10-11
	19	National holiday		
	21	Goal Programming	Chapter 6	1-8,10-11
	26	Nonlinear Programming	Chapter 6	1-8,10-11
	28	Review		
	TBA	Final	All after Midterm 1	1-11