ÇANKAYA UNIVERSITY
Faculty of Economics and Administrative Sciences
Course Definition Form

Part I. Basic Course Information

Department Name	MANAGEMENT	**Dept. Numeric Code**	3 2

Course Code	M A N 2 0 5	**Number of Weekly Lecture Hours**	2	**Number of Weekly Lab/Tutorial Hours**	2	**Number of Credit Hours**	3
Course Web Site	http:// man205.cankaya.edu.tr			**ECTS Credit**			0 5

Course Name and Other Course Information
This information will appear in the printed catalogs and on the web online catalog.

English Name	Introduction to Operations Research
Turkish Name	Yöneylem Araştırmasına Giriş
Mode of Delivery	Face to Face
Language of Instruction	English

Course Description
Provide a brief overview of what is covered during the semester. This information will appear in the printed catalogs and on the web online catalog.
Maximum 60 words.

This course is one of the basic courses in quantitative methods. Topics included in the course are: an overview of operations research; the methodology of mathematical modeling; scientific methodology; linear programming; the graphical, algebraic, and computer solutions of linear programming models; duality; sensitivity analysis and its applications; integer programming; mix integer programming and solution methods; networks; transportation and assignment problems.

Prerequisites (if any) *Give course codes and check all that are applicable.*	1st [ ]	2nd [ ]	3rd [ ]	4th [ ]
	☐ Consent of the Instructor	☐ Senior Standing	☐ Give others, if any.	
Co-requisites (if any)	1st [ ]	2nd [ ]	3rd [ ]	4th [ ]
Course Type *Check all that are applicable*	☒ Must course for dept.	☐ Must course for other dept.(s)	☐ Elective course for dept.	☒ Elective course for other dept.(s)

Part II. Detailed Course Information

Course Objectives
Maximum 100 words.
This course teaches the students how to formulate and solve deterministic optimization models, including linear and network programming problems. The objective of the course is to endow the students with complete command over a set of tools that can be used in business operations. This includes knowing how to formulate an optimization problem, how to solve that problem using computer modeling languages, which analytical theories and computational methods underlie the solution procedure, and how to interpret the result and its sensitivity analysis.

Learning Outcomes
Explain the learning outcomes of the course. Maximum 10 items.
Upon the successful completion of the course students will: 1.Formulate a real-world problem as a mathematical programming model 2.Understand the theoretical workings of the simplex method for linear programming and perform iterations of it by hand 3.Understand the relationship between a linear program and its dual , including strong duality and complementary slackness 4.Perform sensitivity analysis to determine the direction and magnitude of change of a model's optimal solution as the data change 5.Solve specialized linear programming problems like the transportation and assignment problems 6. Solve network models like the shortest path, minimum spanning tree, and maximum flow problems.

Textbook(s)
List the textbook(s), if any, and other related main course material.

Author(s)	Title	Publisher	Publication Year	ISBN
Bernard W. Taylor	Int. to Management Science	Perason	2007	0-13-237119-7

Reference Books
List, if any, other reference books to be used as supplementary material.

Author(s)	Title	Publisher	Publication Year	ISBN
Anderson, Sweeney, Williams	An Introduction to Management Science, Quantitative Approaches To Decision Making, 11th Ed.	Thomson	2005	0-324-20231-8
Hiller and Lieberman	Introduction to Operations Research, 8th Ed.	Mc Graw Hill	2005	0-07-321114-1

Teaching Policy
Explain how you will organize the course (lectures, laboratories, tutorials, studio work, seminars, etc.)
Four hours of lecturing. Different problem sheets are posted in the web page of the course. Students are expected to solve the examples.

Laboratory/Studio Work
Give the number of laboratory/studio hours required per week, if any, to do supervised laboratory/studio work and list the names of the laboratories/studios in which these sessions will be conducted.
N/A

Computer Usage
Briefly describe the computer usage and the hardware/software requirements for the course.
Optimization Software (Exp: Lindo, Excel, OPL)

Course Outline
List the weekly topics to be covered.

Week	Topic(s)
1	Introduction, Problem Solving and Decision Making, Qualitative analysis, Quantitative analysis.
2	Model Development, Data Preparation, Model Solution, Introduction to Linear Programming.
3	The Graphical Solution of Two-Variable Linear Programming Problems.
4	Treatment of Special cases, General algebraic approach.
5	Solving linear systems equations, Introduction to Simplex algorithm.
6	Simplex algorithm approach.
7	Midterm exam
8	Sensitivity analysis of optimization and other problems.
9	Integer Programming
10	Mix Integer Programming
11	Transportation Problems
12	Assignment Problems.
13	Transshipment Problems
14	Network Models

Grading Policy
List the assessment tools and their percentages that may give an idea about their relative importance to the end-of-semester grade.

Assessment Tool	Quantity	Percentage	Assessment Tool	Quantity	Percentage	Assessment Tool	Quantity	Percentage
Quiz(s)	3	%20						
Midterm	1	%10						
Assignment	1	%30						
Final	1	%40						

ECTS Workload
List all the activities considered under the ECTS.

Activity	Quantity	Duration (hours)	Total Workload (hours)
Attending Lectures (*weekly basis*)	13	4	56
Attending Labs/Recitations (*weekly basis*)	-	-	-
Compilation and finalization of course/lecture notes (*weekly basis*)	7	2	14
Collection and selection of relevant material (*once*)	1	2	2
Self study of relevant material (*weekly basis*)	14	3	42
Take-home assignments	3	4	12
Preparation for quizzes	3	2	6
Preparation for mid-term exams (*including the duration of the exams*)	1	10	10
Preparation of term paper/case-study report (*including oral presentation*)	-	-	-

Preparation of term project/field study report (*including oral presentation*)	-	-	-
Preparation for final exam (*including the duration of the exam*)	1	10	10
TOTAL WORKLOAD **/** 25			152/25
ECTS Credit			**6**

Program Qualifications vs. Learning Outcomes *Consider the program qualifications given below as determined in terms of learning outcomes and acquisition of capabilities for all the courses in the curriculum. Look at the learning outcomes of this course given above. Relate these two using the Likert Scale by marking with X in one of the five choices at the right.*

No	Program Qualifications	Contribution				
		0	1	2	3	4
1	Acquire detailed knowledge concerning the economic and legal environment in which the business entities operate.				x	
2	Have profound theoretical background knowledge in basic business functions comprising organization and management, accounting, finance, marketing, and production and operations management.					X
3	Obtain basic and intermediate level knowledge in quantitative techniques and methods that are predominantly used in business and management.		X			
4	Have more specific knowledge in one of the business functions (including the mastery of quantitative approaches) that he/she has chosen to specialize.			X		
5	Be able to apply the professional knowledge necessary to establish and/or run a business, or a department within a business entity.				X	
6	Be able to collect, edit, analyze, and interpret the representative data by applying both qualitative and quantitative methods in order to identify and clearly define the business problems and to develop insight and solutions.					X
7	Be able to adequately communicate upon analyses, findings, inferences, and recommendations with his/her superiors, team members, colleagues, and subordinates both in written and oral form.			X		
8	Be thereby qualified to conduct research in business administration and management.			X		
9	Be appropriately trained to fulfill his/her responsibilities in team work both as a leader and an expert.		X			
10	Acquire the necessary skills to communicate effectively with the stakeholders of an organization so that he/she can become capable of analyzing the needs of the stakeholders and based on these analyses developing the objectives of the organization.				X	
11	Gain self-evaluation skills to identify exactly his/her self-learning and self-improvement needs, being at the same time equipped with the capacity to follow advanced courses and degree studies.				X	
12	Gain the ability to evaluate the organization that he/she is affiliated with and the ability to assess the knowledge that he/she has acquired in a critical perspective.				X	
13	Be able to use English, which is the medium of instruction in the department, at least in European Language Portfolio B1 General Level.					X
14	Be able to use information technologies applicable to business administration and management at European Computer Usage License Basic Level.			X		

Scale for contribution to a qualification: **0**-none, **1**-little, **2**-moderate, **3**-considerable, **4**-highest