OSTIM TECHNICAL UNIVERSITY
FACULTY OF ECONOMICS AND ADMINISTRATIVE SCIENCES
MANAGEMENT INFORMATION SYSTEMS DEPARTMENT
COURSE SYLLABUS FORM

MIS 417 Multi-objective Decision Making Methods							
Course Name	**Course Code**	**Period**	**Hours**	**Application**	**Laboratory**	**Credit**	**ECTS**
Multi-objective Decision Making Methods	MIS 417	5	4	0	0	4	5

Language of Instruction	English
Course Status	Compulsory
Course Level	Bachelor
Learning and Teaching Techniques of the Course	Lecture, Question-Answer, Problem Solving

Course Objective

The aim of this course is to introduce students to the principles of decision making and the fundamentals of constrained criteria/multi-criteria, to carry out the measurement and drawing of multi-criteria optimization problems.

Learning Outcomes

Upon successful completion of this course, a student is expected to have the following abilities:

1. To be able to define the basic concepts of decision making.
2. To be able to explain the basic concepts of conflicting criteria and multi-criteria.
3. Ability to model multi-criteria decision making problems.
4. To be able to solve multi-criteria optimization problems with an appropriate method.
5. Ability to analyze real problems with conflicting criteria, individually or as a team member, and report the results.

Course Outline

This course includes the following topics;

• Introduction to multi-criteria and multi-objective decision making and the basics of multi-criteria optimization,

• Formulation of general multi-criteria optimization problem

• Classification of multi-criteria optimization methods

• Goal programming approach

• Applications of consensus programming

Weekly Topics and Related Preparation Studies		
Weeks	**Topics**	**Preparation Studies**
1	Overview and definitions	
2	Investment Problem	
3	Decision Analysis and Utility Theory	
4	Discrete Alternatives	
5	Multi-criteria mathematical programming	
6	Test for Convex Sets, Functions, and Convexity	
7	Goal Programming: Modeling and Graphical Solution	
8	**MIDTERM EXAM**	
9	Goal Programming: Preemptive vs non-preemptive solution and PAGP Algorithm	
10	Global Criteria Method and Reconciliation Programming	
11	Multiple Parametric Decomposition	
12-13	Multi-Criteria Simplex Method	
14	Interactive approaches	
15	Comparison of multi-criteria decision making methods	
16	**FINAL EXAM**	

Textbook(s)/References/Materials:
Textbook: Steuer, R. (1989) Multiple Criteria Optimization: Theory, Computation, and Application, Krieger Pub Co. Winston W. L. (2004) Operations Research Applications and Algorithms, 4th Ed., Brooks/Cole - Thomson Learning.
Supplementary References:
Other Materials:

Assessment		
Studies	**Number**	**Contribution margin (%)**
Attendance		
Lab		
Class participation and performance		
Field Study		
Course-Specific Internship (if any)		
Quizzes / Studio / Critical		
Homework	1	10
Presentation		
Projects		
Report		
Seminar		
Midterm Exam/Midterm Jury		
General Exam / Final Jury	**1**	**40**
Total	**1**	**50**
Success Grade Contribution of Semester Studies		**100**
Success Grade Contribution of End of Term		**50**
Total		**50**

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Course hours (Including the exam week): 16 x total course hours)	16	3	48
Laboratory			
Application			
Course-Specific Internship (if any)			
Field Study			
Study Time Out of Class			
Presentation / Seminar Preparation			
Projects			
Reports			
Homework			
Quizzes / Studio Review	1	5	5
Preparation Time for Midterm Exams / Midterm Jury	1	20	20
Preparation Period for the Final Exam / General Jury	1	35	35
Total Workload	**(128/30 = 4,3)**		**128**

Course' Contribution Level to Learning Outcomes						
Nu	**Learning Outcomes**	**Contribution Level**				
		1	**2**	**3**	**4**	**5**
LO1	To be able to define the basic concepts of decision making.					X
LO2	To be able to explain the basic concepts of conflicting criteria and multi-criteria.					X
LO3	Ability to model multi-criteria decision making problems.					X
LO4	To be able to solve multi-criteria optimization problems with an appropriate method.					X
LO5	Ability to analyze real problems with conflicting criteria, individually or as a team member, and report the results.					X

	Relationship Between Course Learning Outcomes and Program Competencies (Department of Management Information Systems)						
Nu	**Program Competencies**	**Learning Outcomes**					**Total Effect (1-5)**
		LO1	**LO2**	**LO3**	**LO4**	**LO5**	
1	Recognize and distinguish the basic concepts such as data, information, and knowledge in the field of Management Information Systems and know the processes to be followed for data acquisition, storage, updating, and security.						
2	Develop and manage databases suitable for collecting, storing, and updating data.						
3	As a result of his/her ability to think algorithmically, and easily find solutions to problems concerning basic business functions.			x	x		**5**
4	Learn programming logic, and have information about current programming languages.						
5	Be able to use up-to-date programming languages.		x	x			**4**
6	Be able to take part in teamwork or lead a team using knowledge of project management processes.						
7	Know ethical and legal rules, and use professional field knowledge within the scope of ethical and legal rules.		x	x			**4**
8	Know the fundamental areas of business administration namely management and organization, production, finance, marketing, numerical methods, accounting, etc., and have the knowledge and skills to work in-depth in at least one of them.	x	x				**2**
9	Be able to solve the problems encountered in the field of internet programming by designing web applications.			x	x		**2**
10	Develop and manage logistics and supply chain management activities				x	x	**2**
11	Adapt his/her theoretical knowledge and the experience he/she will gain through practice at the departments of businesses such as information technologies, R&D, and management to real life.			x	x	x	**5**
12	Be able to develop strategies that will provide a competitive advantage with his/her advanced knowledge of management strategies and management functions.						

13	Develop a business idea, commercialize the business idea, and design and manage his/her venture using entrepreneurial knowledge.						
14	By using English effectively, they can follow, read, write, speak and communicate universal information in the field of management information systems in a foreign language with professional competence.						
Total Effect							**25**

Policies and Procedures
Web page: https://www.ostimteknik.edu.tr/management-information-systems-english-1241/915
Exams: The exams aim at assessing various dimensions of learning: knowledge of concepts and theories and the ability to apply this knowledge to real-world phenomena, through analyzing the situation, distinguishing problems, and suggesting solutions. The written exams can be of two types, ie. open-ended questions, which can also be in the form of problems or multiple-choice questions.
Assignments: Quizzes and Homework (Assignments) might be applicable. Scientific Research Ethics Rules are very important while preparing assignments. The students should be careful about citing any material used from outside sources and reference them appropriately.
Missed exams: Any student missing an exam needs to bring an official medical report to be able to take a make-up exam.
Projects: A group project with teamwork is welcome.
Attendance: Attendance requirements are announced at the beginning of the term. Students are usually expected to attend at least 70% of the classes during each term.
Objections: If the student observes a material error in his/her grade, he/she has the right to place an objection to the Faculty or the Department. The claim is examined and the student is notified about its outcome.