

Faculty	Faculty of Engineering	
Program	B.Sc. in Civil Engineering	Elective
	B.Sc. in Computer Engineering	Elective
	B.Sc. in Electrical-Electronics Engineering	Elective
	B.Sc. in Industrial Engineering	Elective
	B.Sc. in Mechanical Engineering	Elective

Course Code	IE 434			
Course Title in English	Transportation and Logistics			
Course Title in Turkish	Taşımacılık ve Lojistik			
Language of Instruction	English			
Type of Course	Flipped Classroom/Lecture			
Level of Course	Undergraduate			
Course Category (by % of Content)	Basic Science	Basic Engineering	Engineering Design	General Education
	10	40	50	-
Semester Offered	Spring			
Contact Hours per Week	Lecture: 3 hours	Recitation:	Lab:	Other:
Estimated Student Workload	156 hours			
Number of Credits	6 ECTS			
Grading Mode	Standard Letter Grade			
Pre-requisites	IE 202			
Expected Prior Knowledge	Prior knowledge in operations research, and capability of using GAMS software and coding with computer programming are expected.			
Co-requisites	-			
Registration Restrictions	-			
Overall Educational Objective	To learn the application of the operations research in logistics and transportation			
Course Description	This course is concerned with the planning and control problems observed in transportation and distribution logistics. The aim of the course is to provide students with a solid understanding of the analytical methods and approaches to model and solve real-life logistics management problems, such as facility location and allocation problems, service network design problems, multi-modal transportation problems, and vehicle routing problems. The student is expected to learn and understand the theory and solution techniques which are needed to obtain solutions for the well-known logistics problems. Therefore, the student should be familiar with the basics of operations research, and be capable of using GAMS software and coding with computer programming.			
Course Description in Turkish	Bu ders ulaştırma ve dağıtım lojistiğinde gözlemlenen planlama ve kontrol problemleriyle ilgilidir. Dersin amacı öğrencilere tesis yeri ve tahsis problemleri, servis ağı tasarımı problemleri, çok-modlu ulaştırma problemleri ve araç rotalama problemleri gibi gerçek hayatta ortaya çıkan lojistik yönetimi problemlerini modellemek ve çözmek için analitik yöntemler ve yaklaşımlar hakkında sağlam bir anlayış kazandırmaktır. Öğrencinin, iyi bilinen lojistik problemlerine çözüm bulmak için gereken teori ve çözüm tekniklerini öğrenmesi ve anlaması beklenir. Bu nedenle öğrenci, yöneylem araştırmasının temellerini bilmeli, GAMS yazılımını kullanabilmeli ve bilgisayar programlama ile kod yazabilmelidir.			
Course Learning Outcomes and Competences	Upon successful completion of the course, the learner is expected to: <ol style="list-style-type: none"> 1. identify and specify the basic principles and concepts of logistics systems design; 2. model long-haul and short-haul freight transportation problems; 3. model location and warehouse logistics management problems; 4. explore heuristic algorithms for solving logistics and transportation problems; 5. apply his/her modelling and coding skills to solve instances with an optimization software; 			

	6. implement and explain the application of heuristic solution procedures; 7. function effectively as a member of a team; 8. give a demonstration of a designed algorithm.		
Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
Student Outcomes	N=None S=Supportive H=High		Exam, Project, HW, Experiment, Presentation, etc.
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	H	1	Exams, Quizzes, Project, Flipped Classroom Practice, Active Learning Activities
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	H	2, 3	Exams, Quizzes, Project, Flipped Classroom Practice, Active Learning Activities
(3) an ability to communicate effectively with a range of audiences	H	8	Project
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts			
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	H	7	Project
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	H	5, 6	Exams, Quizzes, Project, Flipped Classroom Practice, Active Learning Activities
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	S	4	Exams, Quizzes, Project, Flipped Classroom Practice, Active Learning Activities
Prepared by and Date	Asst. Prof. Duygu Taş / January 2020		
Semester	Spring 2019-2020		
Name of Instructor	Asst. Prof. Duygu Taş		
Course Contents	Week	Topic	
	1.	Introducing logistics	
	2.	Long-haul transport problems	
	3.	Traveling salesman problem	
	4.	Vehicle routing problems (VRP)	
	5.	VRP with Time Windows	
	6.	Arc Routing Problems	
	7.	Electric VRP	
	8.	Single-echelon location	
	9.	Single-echelon and two-echelon location problems	
	10.	Location covering and p-centre problems	
	11.	Hybrid methods and stochastic location problems	
	12.	Selecting the suppliers	
	13.	Warehouse logistics management	
	14.	Term project presentations	
	15.	Final Exam/Project/Presentation Period	
	16.	Final Exam/Project/Presentation Period	

Required/Recommended Readings	Textbook: "Introduction to Logistics Systems Management. G. Ghiani, G. Laporte, R. Musmanno. 2nd Edition, John Wiley & Sons, 2013." Additional Reference: "Vehicle Routing: Problems, Methods, and Applications. P. Toth, D. Vigo, 2nd Edition, MOS & SIAM, 2014"														
Teaching Methods	Lectures/contact hours using "flipped classroom" as an active learning technique														
Homework and Projects	A project will be completed in groups of students.														
Laboratory Work	-														
Computer Use	Yes														
Other Activities	-														
Assessment Methods	<table border="1"> <thead> <tr> <th>Types of assessment</th> <th>Ratio (%)</th> </tr> </thead> <tbody> <tr> <td>Midterm Exam</td> <td>20</td> </tr> <tr> <td>Quizzes</td> <td>15</td> </tr> <tr> <td>Flipped Classroom Practice</td> <td>15</td> </tr> <tr> <td>Term Project</td> <td>20</td> </tr> <tr> <td>Final Exam</td> <td>30</td> </tr> <tr> <td>Total</td> <td>100</td> </tr> </tbody> </table>	Types of assessment	Ratio (%)	Midterm Exam	20	Quizzes	15	Flipped Classroom Practice	15	Term Project	20	Final Exam	30	Total	100
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Course Administration	<p>Instructor's office and phone number: 570, 212 3953717; office hours: TBA; email: tasd@mef.edu.tr</p> <p>Exams and quizzes: Closed book and closed notes.</p> <p>Rules for attendance: Classroom practice contributes to 15% of the final grade.</p> <p>Missing a quiz or midterm: You are expected to be present without exception and to plan any travel around these dates accordingly. Medical emergencies are of course excluded if accompanied by a doctor's note. A note indicating that you were seen at the health center on the day of the exam is <u>not</u> a sufficient documentation of medically excused absence from the exam. <u>The note must say that you were medically unable to take the exam.</u> Provided that proper documents of excuse are presented, either missed exam by the student will be given the grade of the final exam or a make-up exam will be given. If you fail to take the exam on the assigned day and do not have a valid excuse, you will be given zero (0) on the exam. Employment interviews, employer events, weddings, vacations, etc. are not excused absences.</p> <p>Missing a final: Faculty regulations.</p> <p>Missing a project: Project deadlines are always extendable up to 72 hours, with submissions late for (0,24] hours receive 70% of the credit they get, (24,48] hours receive 35%, and (48,72] receive 10%.</p> <p>A reminder of proper classroom behavior, code of student conduct: YÖK Regulations</p> <p>Statement on plagiarism: YÖK Regulations (http://3fcampus.mef.edu.tr/uploads/cms/webadmin.mef.edu.tr/4833_2.pdf)</p> <p>Dates:</p> <p>Quizzes (at the beginning of the lecture, duration: 30-45 minutes): Quiz 1: TBA, Quiz 2: TBA, Quiz 3: TBA</p> <p>Midterm (at 18:00, duration: 90 minutes): TBA; Final: TBA</p> <p>Deadline of the project: The last lecture in the 14th week (by 17:00)</p> <p>Disclaimer: The instructor reserves the right, when necessary, to alter the grading policy, change examination dates, and modify the syllabus and course content. Modifications will be announced in class. Students are responsible for the announced changes.</p>														

ECTS Student Workload Estimation	Activity	No/Weeks	Hours			Calculation	Explanation
		No/Weeks per Semester (A)	Preparing for the Activity (B)	Spent in the Activity Itself (C)	Completing the Activity Requirements (D)		
	Lecture	14	1	3	2	84	A*(B+C+D)
	Quizzes	3	2	1		9	A*(B+C+D)
	Midterm(s)	1	16	2		18	A*(B+C+D)
	Project, Presentation	1	5	20		25	A*(B+C+D)
	Final Examination	1	18	2		20	A*(B+C+D)
	Total Workload					156	
	Total Workload/25					6.24	
ECTS					6		