

<b>Faculty</b>	<b>Faculty of Engineering</b>	
<b>Program</b>	<b>B.Sc. in Civil Engineering</b>	<b>Elective</b>
	<b>B.Sc. in Computer Engineering</b>	<b>Elective</b>
	<b>B.Sc. in Electrical-Electronics Engineering</b>	<b>Elective</b>
	<b>B.Sc. in Industrial Engineering</b>	<b>Required</b>
	<b>B.Sc. in Mechanical Engineering</b>	<b>Elective</b>

<b>Course Code</b>	IE 208			
<b>Course Title in English</b>	Operations and Facilities Design			
<b>Course Title in Turkish</b>	Operasyon ve Tesis Tasarımı			
<b>Language of Instruction</b>	English			
<b>Type of Course</b>	Flipped Classroom/Lecture			
<b>Level of Course</b>	Undergraduate			
<b>Course Category (by % of Content)</b>	Basic Science	Basic Engineering	Engineering Design	General Education
	20	60	20	-
<b>Semester Offered</b>	Spring			
<b>Contact Hours per Week</b>	Lecture: 3 hours	Recitation: -	Lab: -	Other: -
<b>Estimated Student Workload</b>	128 hours			
<b>Number of Credits</b>	5 ECTS			
<b>Grading Mode</b>	Standard Letter Grade			
<b>Pre-requisites</b>	-			
<b>Expected Prior Knowledge</b>	-			
<b>Co-requisites</b>	IE 202			
<b>Registration Restrictions</b>	Only Undergraduate Students			
<b>Overall Educational Objective</b>	To learn basic methods for facility layout and facility planning problems			
<b>Course Description</b>	Facilities design and planning is the process of laying out and locating new manufacturing and service facilities, and revising or improving old facilities with respect to constraints on resources such as space and budget. This course addresses both facility layout and facility location problems. As a part of the first problem (layout procedures), the arrangement of departments within a manufacturing or service facility is considered. Moreover, the student is expected to learn and understand the theory, application methods and important techniques which are required to model, analyze and propose location for a single or multiple facilities.			
<b>Course Description in Turkish</b>	Tesis tasarım ve planlama, kaynaklar üzerindeki kısıtlara göre (örneğin, alan ve bütçe) yeni üretim ve servis tesislerinin düzenlenmesi ve yerleştirilmesi, ve mevcut tesislerin düzeltilmesi ya da iyileştirilmesi sürecidir. Bu ders, hem tesis düzenleme hem de tesis yerleşim problemlerine değinmektedir. İlk problemin bir parçası olarak, bir üretim ya da servis tesisi içerisindeki bölümlerin düzenlemeleri ele alınmaktadır. Ek olarak, öğrencinin bir ya da birden çok tesis için ihtiyaç duyulan modelleme, analiz ve yerleşim önerileri için gerekli olan teoriyi, uygulama metodlarını ve önemli teknikleri öğrenmesi ve anlaması beklenmektedir.			
<b>Course Learning Outcomes and Competences</b>	Upon successful completion of the course, the learner is expected to: <ol style="list-style-type: none"> <li>1. identify and specify the basic principles and concepts of facilities design;</li> <li>2. evaluate the value of facilities planning on a strategy of a firm;</li> <li>3. define and analyze product, process and schedule design and understand their relationship with facilities design;</li> <li>4. develop mathematical models for facility layout and facility location problems;</li> <li>5. solve facility layout and facility planning problems by implementing basic methods and algorithmic approaches.</li> </ol>			

Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
<b>Student Outcomes</b>	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, 2, 3	Exams, Quizzes, 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	S	4, 5	Exams, Quizzes, Flipped Classroom Practice, Active Learning Activities
(3) an ability to communicate effectively with a range of audiences			
(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			
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions			
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies			
<b>Prepared by and Date</b>	Asst. Prof. Duygu Taş / January 2020		
<b>Semester</b>	Spring 2019-2020		
<b>Name of Instructor</b>	Dr. Fatma Kutlu Gündoğdu		
<b>Course Contents</b>	Week	Topic	
	1.	Introduction to facilities planning and facilities design	
	2.	Product, process, and schedule design	
	3.	Product, process, and schedule design	
	4.	Flow systems, activity relationships, and space requirements	
	5.	Production and material handling equipment selection	
	6.	Layout planning models and design algorithms	
	7.	Layout planning models and design algorithms	
	8.	Warehousing: storage and retrieval systems	
	9.	Flexible manufacturing systems	
	10.	Flexible manufacturing systems	
	11.	Facility location models	
	12.	Facility location models	
	13.	Location-allocation models	
	14.	Algorithms for manufacturing systems	
	15.	Final Exam/Project/Presentation Period	
	16.	Final Exam/Project/Presentation Period	
<b>Required/Recommended Readings</b>	Textbook: "Facilities Planning, J.A. Tompkins, J.A. White, Y.A. Bozer, J.M.A. Tanchoco, 4 <sup>th</sup> edition, Wiley, 2010" Additional References: 1.) "Facilities Design, Sunderesh Heragu, 3 <sup>rd</sup> edition, CRC Press, 2008" 2.) "Modeling and Analysis of Manufacturing Systems, R.G. Askin, C.R. Standridge, John Wiley & Sons, Inc., New York, 1 <sup>st</sup> edition."		
<b>Teaching Methods</b>	Lectures/contact hours using "flipped classroom" as an active learning technique		
<b>Homework and Projects</b>	-		

<b>Laboratory Work</b>	-												
<b>Computer Use</b>	-												
<b>Other Activities</b>	-												
<b>Assessment Methods</b>	<table border="1"> <thead> <tr> <th>Types of assessment</th> <th>Ratio (%)</th> </tr> </thead> <tbody> <tr> <td>Midterm Exam</td> <td>25</td> </tr> <tr> <td>Quizzes</td> <td>20</td> </tr> <tr> <td>Flipped Classroom Practice</td> <td>15</td> </tr> <tr> <td>Final Exam</td> <td>40</td> </tr> <tr> <td>Total</td> <td>100</td> </tr> </tbody> </table>	Types of assessment	Ratio (%)	Midterm Exam	25	Quizzes	20	Flipped Classroom Practice	15	Final Exam	40	Total	100
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<b>Course Administration</b>	<p><b>Instructor's</b></p> <ul style="list-style-type: none"> <li>-office and phone number: 5<sup>th</sup> floor, 212 3953717</li> <li>-office hours: TBA</li> <li>-email address: duygu.tas@mef.edu.tr</li> </ul> <p><b>Exams and quizzes:</b> Closed book and closed notes.</p> <p><b>Rules for attendance:</b> Classroom practice contributes to 15% of the final grade.</p> <p><b>Missing a quiz:</b> No make-up will be given for the missed quizzes. For certain excuses (decided by the instructor) the percentage of the missed quiz may be added to the midterm or to the final.</p> <p><b>Missing a midterm:</b> 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, missed midterm by the student will be given the grade of the final exam. No make-up 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><b>Eligibility to take the final exam:</b> Students are required to collect a weighted average of <u>at least 20 points</u> from midterm exam, quizzes and participation to be able to take the final exam.</p> <p><b>Missing a final:</b> Faculty regulations.</p> <p><b>A reminder of proper classroom behavior, code of student conduct:</b> YÖK Regulations</p> <p><b>Statement on plagiarism:</b> YÖK Regulations (<a href="http://3fcampus.mef.edu.tr/uploads/cms/webadmin.mef.edu.tr/4833_2.pdf">http://3fcampus.mef.edu.tr/uploads/cms/webadmin.mef.edu.tr/4833_2.pdf</a>)</p> <p><b>Dates:</b></p> <p><b>Quizzes (at the beginning of the course, duration: 45 minutes):</b> Quiz 1: TBA; Quiz 2: TBA; Quiz 3: TBA</p> <p><b>Midterm (at 18:00, duration: 120 minutes):</b> TBA</p> <p><b>Final:</b> TBA</p> <p><b>Disclaimer:</b> 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>												

<b>ECTS Student Workload Estimation</b>	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/Flipped Classroom	14	1	3	1	70	A*(B+C+D)
	Quizzes	3	3	1		12	A*(B+C+D)
	Midterm(s)	1	20	2		22	A*(B+C+D)
	Assingment, Project, Presentation	0	0	0		0	A*(B+C+D)
	Final Examination	1	22	2		24	A*(B+C+D)
	Total Workload					128	
	Total Workload/25					5,12	
	ECTS					5	