



MARMARA UNIVERSITY - FACULTY OF ENGINEERING

2017-2018 Fall

IE3081 Modeling and Discrete Simulation

**COURSE DESCRIPTION FORM**

<b>Offering Department</b>		Department of Computer Engineering		Undergraduate must course (5th semester)						
<b>Course Code</b>		IE3081								
<b>Course Name</b>		Modeling and Discrete Simulation								
<b>Language of Instruction</b>		English								
<b>ECTS</b>		4								
<b>Contact Hours</b>		Theoretical (T): 3		Practice (U):		Laboratory(L):				
<b>Pre-requisites</b>		STAT2053 Introduction to Probability and Statistics								
<b>Instructor</b>		<b>Name</b>		Müjdat Soytürk						
		<b>E-mail</b>		mujdat.soyturk@marmara.edu.tr						
<b>Course Materials</b>		<b>Mandatory</b>		Banks, Carson, Nelson, Nicol, Discrete-Event System Simulation, 5th Edition, Pearson 2010.						
		<b>Recommended</b>		Lawrence M. Leemis, Stephen K. Park, Discrete-Event Simulation: A First Course, Prentice Hall, 2006						
<b>Course Objectives</b>		To be able to model a system, its components and inputs, to perform simulation output analysis and performance evaluation, to make alternative system design.								
<b>Course Content</b>		Introduction to Simulation; Modeling and Simulation: events, activities, processes; Mathematical and Statistical Models in Simulation; Queueing Models; Generation of Random Numbers; Generation of Various Distributions; Analysis of Simulation Data; Input Modeling; Verification and Validation of Simulation Models; Output analysis; Evaluation Alternative System Design								
<b>Learning Outcomes</b>		<b>LO1</b>		To be able to explain the basic principles of simulation modeling and analysis of discrete event systems.						
		<b>LO2</b>		To be able to perform input analysis to determine the random distributions and the parameters of these distributions that will be used in a simulation model.						
		<b>LO3</b>		To be able to apply the random number and random variable generation methods to obtain inputs to represent uncertainties in a system.						
		<b>LO4</b>		To make output analysis of simulations and to estimate the performance of the system.						
		<b>LO5</b>		To be able to design an alternative system of a system and compare its performances with statistical methods.						
		<b>LO6</b>		To be able to model a specific system using a simulation software package, run the model and report the outputs.						
<b>Program Outcomes</b>				<b>LO1</b>	<b>LO2</b>	<b>LO3</b>	<b>LO4</b>	<b>LO5</b>	<b>LO6</b>	
<b>PO3</b>		Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way so as to meet the desired result (a); ability to apply modern design methods for this purpose (b).					a, b	a, b	a, b	
<b>PO11</b>		Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety (a); awareness of the legal consequences of engineering solutions (b).							a	
<b>PO12</b>		Knowledge of advanced mathematics subjects including differential equations, integral calculus (a), linear algebra (b), statistics and probability (c), and discrete mathematics (d).			c	c	c	c		
<b>PO13</b>		Knowledge of mathematics, basic sciences (a), computer science (b) and engineering sciences (c) required for the design and analysis of complex electrical and electronic devices, software and systems including hardware and software.		b	b	b	b	b		
<b>Subjects (Knowledge, Skills and Behaviours), Contributions of Subjects to Learning Outcomes, Assessment Methods</b>		<b>No</b>	<b>Week</b>	<b>Subjects</b>	<b>LO1</b>	<b>LO2</b>	<b>LO3</b>	<b>LO4</b>	<b>LO5</b>	<b>LO6</b>
		S1	1	Introduction to Simulation; Modeling and Simulation	H			H, P	H, P	H, P
		S2	2-3	Events, activities, processes, queuing models	H			H, P	H, P	H, P
		S3	4-6	Mathematical and Statistical Models in Simulation; Generation of Random Numbers; Generation of Various Distributions			H, MF, P			
		S4	7-8	Input Modeling		MF, P				
		S5	9-11	Verification and Validation of Simulation Models; Output analysis				MF, P		
S6	12-14	Design of Alternative Systems and their Evaluation, Variance Reduction				MF, P	MF, P	P		
<b>Assessment Methods and Weights</b>		<b>No</b>	<b>Type</b>	<b>Weight</b>	<b>Implementation Rule</b>			<b>Make-up Rule</b>		
		MF	Midterm, Final	70%	One midterm and one final exam will be held. In the exams, books			Marmara University regulations will be followed for make-up exams.		

				and any course materials are not allowed to use. Use of a calculator is allowed.																																																								
	H	Homeworks	10%	The deadline for the assignment is two weeks after the assignment. Late delivery is not accepted. Zero is taken from the unreported assignment. At least 2 assignments are given.																																																								
	P	Project	20%	The code and the report of the project are collected at the 13th week of the semester. Late delivery is not accepted. Score zero given for the non-delivered project.																																																								
	<b>TOTAL</b>		100%																																																									
<b>Determining Letter Grades</b>	<ul style="list-style-type: none"> <li>The letter grades will be determined based on the midterm and final exams, and project and two homeworks.</li> <li>In order to determine the letter grade, a curve or catalog based method will be followed based on the total average scores of the students.</li> <li>The final exam score and the total average score of the student must be at least 35 to pass the course.</li> <li>According to Marmara University Undergraduate regulations, the weight of the final exam must be at least 40 out of 100.</li> </ul>																																																											
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<b>Academic Honesty</b>	<p>Violations of scholastic honesty include, but are not limited to cheating, plagiarizing, fabricating information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.</p> <p>In case academic dishonesty is observed, the first authority is the instructor of the course. The instructor may decide to give the student zero for the homework(s)/lab(s)/exam(s), give the letter grade FF, or may take disciplinary action.</p>																																																											