

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

<b>Course Code</b>	MATH 224			
<b>Course Title in English</b>	Probability and Statistics for Engineering			
<b>Course Title in Turkish</b>	Mühendislik için Olasılık ve İstatistik			
<b>Language of Instruction</b>	English			
<b>Type of Course</b>	Flipped Classroom			
<b>Level of Course</b>	Undergraduate			
<b>Course Category (by % of Content)</b>	Basic Science 100	Basic Engineering -	Engineering Design -	General Education -
<b>Semester Offered</b>	Spring			
<b>Contact Hours per Week</b>	Lecture: 4 hours	Recitation: -	Lab:-	Other:-
<b>Estimated Student Workload</b>	143 hours			
<b>Number of Credits</b>	6 ECTS			
<b>Grading Mode</b>	Standard Letter Grade			
<b>Pre-requisites</b>	None.			
<b>Expected Prior Knowledge</b>	None.			
<b>Co-requisites</b>	None			
<b>Registration Restrictions</b>	Only Undergraduate Students			
<b>Overall Educational Objective</b>	To learn the fundamentals of probability and statistics and their applications in engineering problems.			
<b>Course Description</b>	This course provides a comprehensive introduction to probability theory and its applications to engineering. The following topics are covered: definition and rules of probability; random variables and uncertainty, expected value, variance and standard deviation of a probability distribution; discrete probability distributions: the Bernoulli, Binomial, geometric and Poisson distributions; continuous probability distributions: the uniform, exponential and normal distributions; multivariate probability distributions, covariance and correlation; descriptive statistics; sampling and sampling distributions; estimation and confidence interval; hypothesis testing; simple regression.			
<b>Course Description in Turkish</b>	Bu derste olasılık kuramına ve mühendislik uygulamalarına kapsamlı bir giriş sağlanmaktadır. Derste işlenen konular arasında; olasılık tanımı ve kuralları; rassal değişkenler ve belirsizlik, beklenen değer, varyans ve standart sapma; ayrık olasılık dağılımları: Bernoulli, Binom, geometrik ve Poisson dağılımları; sürekli olasılık dağılımları: düzgün, üstsel ve normal dağılımlar; çok-değişkenli olasılık dağılımları, kovaryans ve korelasyon; betimleyici istatistikler; örnekleme ve örnekleme dağılımları; kestirim ve güven aralığı; hipotez testleri, basit bağlantım bulunmaktadır.			
<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. describe fundamentals of probability and statistics;</li> <li>2. analyze discrete and continuous probability distributions;</li> <li>3. apply statistical methods to solve complex engineering problems.</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	Exam, Flipped Classroom Practice, Quiz
(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			
(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	H	3	Exam, Flipped Classroom Practice, Quiz
<b>Prepared by and Date</b>	Assoc. Prof. Şuayb Ş. Arslan /9 Jan. 2019		
<b>Semester</b>	Spring 2019-2020		
<b>Name of Instructors</b>	Dr. Şuayb Arslan, Dr. Hüseyin Can Üren		
<b>Course Contents</b>	Week	Topic	
	1.	Definition and rules of probability	
	2.	Definition and rules of probability	
	3.	Fundamentals of random variables	
	4.	Discrete probability distributions	
	5.	Discrete probability distributions	
	6.	Continuous probability distributions	
	7.	Continuous probability distributions	
	8.	Multivariate probability distributions	
	9.	Multivariate probability distributions	
	10.	Statistics, sampling and sampling distributions	
	11.	Estimation	
	12.	Hypothesis Testing	
	13.	Hypothesis Testing	
	14.	Simple regression	
	15.	Final Exam/Project/Presentation Period	
	16.	Final Exam/Project/Presentation Period	
<b>Required/Recommended Readings</b>	<p>Required: Probability and Statistics for Engineers, R. L. Scheaffer, J.T. McClave, Duxbury Press, 5th Edition, 2010</p> <p>Recommended: Introduction to Probability and Statistics for Engineers and Scientists, S. M. Ross, John Wiley&amp; Sons, 4th Edition, 2009</p>		

	Introduction to Probability and Statistics: Principles and Applications for Engineering and the Computing Sciences, J.S. Milton, McGraw-Hill, 4th Edition, 2002															
<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>Number</th> <th>Ratio (%)</th> </tr> </thead> <tbody> <tr> <td>Midterm Exams</td> <td>2</td> <td>33</td> </tr> <tr> <td>Flipped Classroom Practice</td> <td>14</td> <td>14(1% each)</td> </tr> <tr> <td>Quiz</td> <td>5</td> <td>20(4% each)</td> </tr> <tr> <td>Total</td> <td></td> <td>100</td> </tr> </tbody> </table>	Types of assessment	Number	Ratio (%)	Midterm Exams	2	33	Flipped Classroom Practice	14	14(1% each)	Quiz	5	20(4% each)	Total		100
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<b>Course Administration</b>	<p><b>Instructor's office:</b> 5<sup>th</sup> Floor  <b>Office hours:</b> Tue 16:00-17:00.  <b>E-mail address:</b> arslans@mef.edu.tr, unenc@mef.edu.tr  <b>Rules for attendance:</b> Classroom practice contributes to 14% of the final grade.  <b>Missing a midterm:</b> Provided that proper documents of excuse are presented, each missed midterm by the student will be given the grade of the final exam. No make-up will be given.  <b>Missing a final:</b> Faculty regulations.  <b>A reminder of proper classroom behavior, code of student conduct:</b> YÖK Regulations  <b>Academic dishonesty and plagiarism:</b> YÖK Regulations</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/Flipped Classroom	14	1	3	1	70	A*(B+C+D)
	Quiz	5	4	1		25	A*(B+C+D)
	Midterm(s)	2	22	2		48	A*(B+C+D)
	Final Examination					0	A*(B+C+D)
	Total Workload					143	
	Total Workload/25					5.72	
	ECTS					<b>6</b>	