IE 227 INTRODUCTION TO PROBABILITY (3 2 4) (ECTS: 6)
Spring 2017 - Tentative Syllabus

This is an introductory course and forms the basis for several other industrial engineering courses in both the undergraduate and the graduate curriculums of the department. Topics of this course include basic probability concepts, counting techniques, conditional probability and independence, random variable concept, types and probability distributions of random variables, special probability distributions (discrete and continuous), jointly distributed random variables, expectation, variance, conditional expectation and variance, functions of random variables and their distributions, sampling distributions of means and sums.

Prerequisite. MCS 156 Calculus for Engineering II.

Course Objectives. This course aims to:
- introduce the concepts of probability, randomness, random variable, and probability distributions,
- develop an understanding of probabilistic thinking,
- introduce examples of randomness in real-life applications,
- show how to use probability to model real-life problems.

Instructors.

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Office Hour:	Monday (13:20-14:10)	Thursday (11:20-12:10)

Teaching Assistant. Hale Akkocaoğlu, Office: L-321, Email: hale@cankaya.edu.tr
Office Hours: Section 1: Tue (11:20-12:10)   Section 2: Mon (13:20-14:10)

Class Meeting Times and Locations.
Section 1: Mon (09:20–11:10) in L-A14, Tue (14:20-15:10) in L-A14
Section 2: Mon (15:20–17:10) in R-A04, Tue (14:20-15:10) in L-A15

Recitation Sessions and Locations.
Section 1: Tuesday (09:20–11:10) in L-A14
Section 2: Wednesday (12:20–14:10) in L-A14

Textbook. Navidi, W. (2015). *Statistics for Engineers and Scientists with Connect Code*. 4th Ed. McGraw-Hill.

Regarding Purchasing the Textbook.
1. The textbook can be purchased from Palme Kitabevi (Olgunlar Sok. No:4 D:5, Bakanlıklar, 06610).
2. The textbook comes together with an access code for the online system called "Connect". Please ask Palme Kitabevi representatives to provide you the access code when you purchase the book.
3. Please do not purchase the textbook from another supplier or buy used books as they will not contain the Connect code.
4. Connect codes are individual and it is not possible to share them with other students.

Supplementary Texts.
1. Walpole, R. E., Myers, R. H., Myers, S. L., and Ye, K. (2017). *Probability and Statistics for Engineers and Scientists*. 9th edition. Pearson.
2. Montgomery, D. C., and Runger, G. C. (2014). *Applied Statistics and Probability for Engineers*. 6th edition. Wiley.
3. Weiss, N. A. (2006). *A Course in Probability*. Pearson.
4. Ross, S. (2014). *A First Course in Probability*. 9th ed. Pearson.

Class Website. Moodle on `http://webonline.cankaya.edu.tr/`

Honesty Policy. All students admitted to Çankaya University should declare his/her understanding and belief in the Honor Code stated by the department for the examinations and assignments. This statement is a reminder to uphold your obligation as a Çankaya University student and to be honest in all work submitted and exams taken in this course and all others.

If you conduct any dishonest act during an examination or for the completion of an assignment (i.e., cheating on an exam, using any extra material that you are not allowed to use during an exam, copying material off of someone else's homework or assignment, using solution keys from previous years, copying material from published and electronic sources without paraphrasing and/or citing appropriately), you will get a credit of zero on that particular exam or assignment. Necessary disciplinary action, as dictated by the rules of the University, will also be taken.

Class Policies.

- **<u>Please come to class on time</u>.** Late arrivals as well as walking out and in during the lectures disrupt the flow of the lecture. Please remember to turn off cellular telephones, tablets or any device that beeps or disturbs the class before you come to class.
- You are responsible for all announcements made in class and on class web page, as well as for printing the lecture notes and other materials from the class web page.

Attendance requirements. An attendance sheet will be distributed every hour (class and recitation hours included). Signing the attendance sheet every hour is your responsibility. It is best if you fully attend every hour. If you miss even a single hour, you may find it hard to understand the course material since the topics are interrelated.

Course Requirements and Grading. All exams will be closed book and closed notes. Formula sheet(s) and/or statistical table(s) will be provided as seen appropriate by the instructors.

- **30% Homework.** There will be three homework assignments, each is 10%.
- **30% Midterm Exam.** There will be one midterm exam.
- **40% Final Exam.** There will be a *comprehensive* final exam.

Grading Policy. Letter grades will be *mainly* based on the standard scale (i.e., catalog grading system) described in Çankaya University regulations. However, if your collected total weighted average is close to the higher cut-off point and depending on the gaps between the totals collected as well as your attendance and involvement in the class, we *may* consider giving you a higher letter grade.

Conditions leading to the letter grade NA. *Any* of the following will lead to letter grade NA.

- If you fail to take the midterm exam (or its makeup), you will NOT be able to take the final exam and you will receive the letter grade NA.
- If you are eligible to take the final exam but fail to take it (or its makeup), you will receive the letter grade NA.

Make-up Policy. Makeup *may* only be considered for Midterm Exam and the Final Exam, with valid, verifiable, documented excuses ONLY (e.g., illness with a doctor's report).

Course Topics. A tentative outline and tentative assignment/exam schedule are given below and the instructors reserve the right to make changes as they see necessary. Please read the lecture notes prior to class.

Week/Day		Topics	Assignment/Exam
1	Feb 13-14	1. Introduction to Probability: Random experiments, sample space, events	
2	Feb 20-21	1. Introduction to Probability: Set Theory, Probability & Its Properties 2. Combinatorial Probability: Addition and Multiplication Rules	
3	Feb 27-28	2. Combinatorial Probability: Permutation, Combination, Applications	
4	Mar 6-7	3. Conditional Probability & Independence: Law of Total Probability, Conditional Probability, Independence, Bayes' Theorem 4. Random Variables, Their Distributions and Characteristics	
5	Mar 13-14	4. Random Variables, Distributions and Characteristics: Discrete Distributions: pmf, cdf, Expectation, Variance	HW1 assigned
6	Mar 20-21	4. Random Variables, Distributions and Characteristics: Continuous Distributions: pdf, cdf, Expectation, Variance	
7	Mar 27-28	5. Discrete Random Variables and Distributions: Bernoulli, Binomial, Hypergeometric, Negative Binomial, Geometric	HW1 due
8	Apr 3-4	5. Discrete RVs & Distributions: Poisson, Discrete Uniform 6. Continuous RVs & Distributions: Uniform, Exponential	Midterm Exam
9	Apr 10-11	6. Continuous RVs & Distributions: Exponential, Normal	HW2 assigned
10	Apr 17-18	6. Continuous RVs & Distributions: Normal, Normal Approximation to Binomial, Gamma	
11	Apr 24-25	6. Continuous RVs & Distributions: Weibull, Beta, Triangular 7. Jointly Distributed Random Variables: Joint Distributions	HW2 due
12	May 2	7. Jointly Distributed Random Variables: Marginal and Conditional Distributions, Independency, Expectation	HW3 assigned
13	May 8-9	7. Jointly Distributed Random Variables: Conditional Expectation, Variance, Conditional Variance	
14	May 15-16	8. Functions of Random Variables 9. Sampling Distribution of Means and Sums	HW3 due

NOTE THAT EVERYTHING ON THIS SYLLABUS IS SUBJECT TO CHANGE. STUDENTS WILL BE NOTED ABOUT ANY CHANGE.