Course number and name	END 252E / Theory of Probability
Credits, contact hours, categorization of credits	3 credits / 42 hours / Math and Basic Sciences
Instructor or course coordinator	H. Kutay TİNÇ
Text book and other supplemental materials	• Sheldon Ross; *A First Course in Probability,* 7th Edition, Prentice Hall International Inc., 2005. • Bertsekas, D.P. and Tsitsiklis J.N., *Introduction to Probability,* Belmont: Athena Scientific, 2002. • Cerit, C. ve M. Yüksel*, Olasılık,* İTÜ Yayınları, 1998.

Course information	
Content	Making a basic introduction to the Theory of Probability which is an important foundation of Industrial Engineering. Showing possible applications, in addition to the theoretical presentation of the subjects, through examples.
Prerequisites	MAT 103E/MAT 101E Mathematics I and MAT 104E/MAT 102E Mathematics II
Type	Required

Course learning outcomes

Students who pass the course will:

I. Learn basic theoretical background information for theory of probability
II. Learn random variables and their use
III. Learn Expectation in a broader perspective
IV. Learn finding some bounds on the probabilities

Student outcomes	Level of contribution
SO1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	High
SO2. 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.	Little
SO3. An ability to communicate effectively with a range of audiences.	Not applicable
SO4. 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.	Not applicable
SO5. 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.	Not applicable
SO6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	Partial
SO7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	Little

Week	Topics	Learning outcome(s)
1	Combinatorial Analysis	I
2	Axioms of Probability	I
3	Conditional Probability and Independence	I
4	Review	I
5	Random Variables (Discrete)	II
6	Random Variables (Discrete and Continuous)	II
7	Random Variables (Continuous)	I,II
8	Review	II
9	Jointly Distributed Random Variables	II
10	Jointly Distributed Random Variables	II
11	Properties of Expectation	III
12	Review	I, II, III
13	Markov Chains	III
14	Limit Theorems	IV