Course number and name	END 480E / Reliability Engineering
Credits, contact hours, categorization of credits	3 credits / 42 hours / Engineering topic
Instructor or course coordinator	Esra BAŞ
Text book and other supplemental materials	• Rausand, M., Hoyland, A. (2004). *System Reliability Theory: Models, Statistical Methods, and Applications*, Wiley-Interscience. • Stephens, M.P. (2010). *Productivity and Reliability-Based Maintenance Management*. Purdue University Press.

Course information	
Content	Teaching the basic concepts and methods in reliability engineering and maintenance management, to provide the knowledge regarding the qualitative and quantitative approaches in reliability engineering, and the competence to apply these approaches.
Prerequisites	END 311E Statistics
Type	Selected elective

Course learning outcomes
Students who pass the course will: I. acquire the basics of reliability engineering. II. comprehend the basic concepts and methods in maintenance management. III. understand the qualitative approaches in reliability engineering and gain the aptitude to apply these approaches. IV. understand the quantitative approaches in reliability engineering and gain the aptitude to apply these approaches.

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

Week	Topics	Learning outcome(s)
1	Basic topics of probability	IV
2	Basic topics of probability and introduction to reliability engineering	I, IV
3	Basics of maintenance management	II
4	Preventive and predictive maintenance	II
5	Failure models in reliability engineering	II, IV
6	Failure models in reliability engineering	II, IV
7	Methods in qualitative system analysis	III
8	Methods in qualitative system analysis	III
9	System reliability in systems of independent components	IV
10	Dependent failures in reliability engineering	IV
11	Markov processes in reliability engineering	IV
12	System reliability of maintained systems	IV
13	System reliability of safety systems	III
14	Contemporary topics in system reliability	I, II, III, IV