

Course number and name	END 308 / Quality Engineering
Credits, contact hours, categorization of credits	2 credits / 28 hours / Engineering topic
Instructor or course coordinator	Seda YANIK, H. Bülent CERİT
Text book and other supplemental materials	<ul style="list-style-type: none"> • <i>Introduction to Statistical Quality Control</i>, Douglas C. Montgomery, 7th ed., 2013.

Course information	
Content	This course covers the fundamental methods of quality engineering. The major emphasis is on the statistical tools of quality engineering systems.
Prerequisites	END 311E Statistics
Type	Required

Course learning outcomes	
Students who pass the course will:	
<ol style="list-style-type: none"> I. Understand the key notions of quality and the voice of the customer to improve product and service quality continuously II. Use the statistical process control methodology, specifically Shewhart Control Charts and the other tools for monitoring and improving the production and service processes III. Carry out process capability analysis and measurement system capability studies IV. Conduct offline quality control studies, namely understand how to design and analyze engineering experiments. 	

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.	High
SO3. An ability to communicate effectively with a range of audiences.	Little
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.	Partial
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.	Little
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.	Not applicable

Week	Topics	Learning outcome(s)
1	Course Overview – Introduction to Quality Concepts	I
2	The DMAIC Process - Probability Distributions	I-II
3	Statistical Inference	II
4	Methods and Philosophy of Statistical Process Control	II-III
5	Control Charts for Variables – x and R charts	VI
6	Control Charts for Variables – x and s charts	VI
7	Control Charts for Attributes	VI
8	Process Capability Analysis	VI
9	CUSUM and EWMA Charts	VI
10	Other Statistical Process Control Methods	VI
11	Experimental Design – k=2	VI
12	Experimental Design – k>2	VI
13	Process Optimization	VI
14	Acceptance-Sampling	VI