

<b>Course number and name</b>	END 454 / Energy Markets and Optimization
<b>Credits, contact hours, categorization of credits</b>	3 credits / 42 hours / Engineering topic
<b>Instructor or course coordinator</b>	Kutay TİNÇ
<b>Text book and other supplemental materials</b>	<ul style="list-style-type: none"> <li>• Kaminski, V. (2012), <i>Energy Markets</i>.</li> <li>• Rosetto, N. (2017), <i>Design The Electricity Market(s) of the Future</i></li> </ul>

<b>Course information</b>	
<b>Content</b>	Analysis of Energy Markets and the flow of energy from production to consumption using operations research tools.
<b>Prerequisites</b>	END 331 Operation Research I, 3 <sup>rd</sup> class, 4 <sup>th</sup> class
<b>Type</b>	Selected elective

<b>Course learning outcomes</b>
<p>Students who pass the course will be able:</p> <ul style="list-style-type: none"> <li>I. Learn about Turkish energy markets.</li> <li>II. Have knowledge of the energy production process.</li> <li>III. Analyze energy data.</li> <li>IV. Interpret analyzed energy data.</li> </ul>

<b>Student outcomes</b>	<b>Level of contribution</b>
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.	High
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.	High
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.	Partial

<b>Week</b>	<b>Topics</b>	<b>Learning outcome(s)</b>
1	Introduction to Energy	I-II
2	Introduction to Energy Markets	I
3	Power Plants	I-II
4	Energy Investment Planning	I
5	Day Ahead Market	I
6	Balancing Market	I
7	Intraday Market	I
8	Over the Counter (OTC) Market	I
9	Power Plant Optimization	II-III-IV
10	Demand and Renewable Energy Production Forecast Models	II-III-IV
11	Energy Markets Price Forecast Models	II-III-IV
12	Micro Grids	II-III-IV
13	Demand Side Management	II-III-IV
14	Energy Storage	II-III-IV