Course number and name	END 382E / Production Methods
Credits, contact hours, categorization of credits	3 credits / 42 hours / Engineering topic
Instructor or course coordinator	Esra Baş
Text book and other supplemental materials	• Boothryd, G., Knight, W.A. 2005. Fundamentals of Machining and Machine Tools. Taylor and Francis Group, CRC, Third Edition • Groover, M.P. Fundamentals of Modern Manufacturing. Materials, Processes and Systems. 4th Edition. John Wiley & Sons, Inc. 2010.

Course information	
Content	Introduction to production methods and classification of production methods, metal-cutting techniques, 3D printing, casting, definition, methods, kinds of casting and explanation of their properties. Welding, definition, classification and explanation of their properties, the techniques of soldering, casting, welding and soldering plans. Basic plastic and plastic deformation theory, joint elements.
Prerequisites	END112E Introduction to Manufacturing
Type	Selected elective

Course learning outcomes
Students who pass the course will: I. Determine how a product can be produced, II. Identify the properties of a product which is produced by molding techniques. III. Identify the properties of a product which is produced by plastic shaping techniques. IV. Identify the properties of a product which is produced by welding techniques. V. Determine the best way of connecting two parts together. VI. Give information about the additive manufacturing techniques.

Student outcomes	Level of contribution
SO1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	Little
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.	Little

Week	Topics	Learning outcome(s)
1	Introduction to Production Methods	I
2	Casting Technology	I, II
3	Types of Casting Methods, Casting Sands	I, II
4	Cast Iron, Foundries	I, II
5	Electric Arc Welding	I, IV
6	Oxyacetylene Welding, Quality Defects	I, IV
7	Bulk Deformation Process and Sheet Metal Working Processes	I, III
8	Rolling, Extrusion, Forging, Drawing	I, III
9	Shearing, Bending, Drawing	I, III
10	Soldering, Adhesion, Bolt-nut Structures	I, V
11	Shaft Hub, Rivet, Close Fits, Springs	I, V
12	Turning, Milling, Planing and Shaping	I
13	Grinding, Drilling, Sandblasting, Honing, Lapping	I
14	Additive Manufacturing, Measurement, Metrology, Calibration	I, VI