Course number and name	END112 / Introduction to Manufacturing Systems
Credits, contact hours, categorization of credits	3 credits / 42 hours / Engineering topic
Instructor or course coordinator	Tufan V. KOÇ
Text book and other supplemental materials	• Obi, S.C. 2013, Introduction to Manufacturing Systems, Author House Press. • Creese, R. 2017, Introduction to Manufaturing Processes and Materials, CRC Press. • Youssef, H.A. El-Hofy, H., 2008, Machining Technology: Machine Tools and Operations, CRC Press.

Course information	
Content	Main concepts of manufacturing, product manufacturing relationship, product system and product development, manufacturing systems, manufacturing processes manufacturing performance and firm performance association is examined.
Prerequisites	None
Type	Required

Course learning outcomes
Students who pass the course will: I. Recognize the manufacturing equipment II. Recognize product's functional and physical structure III. Understand the manufacturing elements' interactions and their impact on firm performance IV. Describe simple manufacturing problems and develop solutions V. Understand the relationship between manufacturing performance and firm performance

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.	Not applicable
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.	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.	Partial
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	Manufacturing concepts and terminology	I
2	Industry, factory, workshop and production line	I
3	Competitive priorities	I, II
4	Product development	II
5	Functional and physical product structure	II
6	Product types	II, III
7	Basic engineering materials	I, III
8	Continuous and discrete manufacturing systems	I, III
9	Metal working processes I	I, III
10	Metal working processes II	I, III
11	Manufacturing operation analysis	I, III
12	Manufacturing automation	III, IV
13	Value concept in manufacturing	IV, V
14	Manufacturing performance improvement	I, V