

Course number and name	END 381 / Technical Design for Industrial Engineering
Credits, contact hours, categorization of credits	3 credits / 42 hours / Engineering topic
Instructor or course coordinator	Murat DURUCU
Text book and other supplemental materials	<ul style="list-style-type: none"> • Vajna, Sándor (Ed.), 2020, <i>Integrated Design Engineering Interdisciplinary and Holistic Product Development</i>, Springer International Publishing, doi: 10.1007/978-3-030-19357-7. • Natalya Shelburne, Adekunle Oduye, Kim Williams, Eddie Lou, 2020, <i>Design Engineering Handbook</i>, InVision • Segun R. Bello, 2012, <i>Technical Drawing Presentation and Practice</i>, Dominion Publishing Services.

Course information	
Content	Importance of Design in Industrial Engineering, Definition, Design Tools, Design Methods, Demonstrating Design Dimensions, Projection of Designs, Drawing Views of Three-Dimensional Designs from Different Perspectives, Computer Aided Design, New Product Design and Development Processes, Design Engineering Approach, Facility Design, Machine Park Layout Plan Creation.
Prerequisites	None
Type	Selected elective

Course learning outcomes
<p>Students who pass the course will:</p> <ol style="list-style-type: none"> I. Information about materials and elements used in designs and layouts II. To grasp the three-dimensional view of objects, to be able to create new products and plans III. Being able to understand and design what the views from different axes mean IV. Understanding the full view of designs from the views at hand, developing the design V. In addition to manual designs, new product, production environment, etc. designs can be created in the computer environment.

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.	Little
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.	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.	Partial
SO7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	High

Week	Topics	Learning outcome(s)
1	Introduction to design in Industrial Engineering, methodologies, tools and techniques	I
2	Structures used in design engineering and their classroom applications	I, II
3	Design techniques	II
4	Scaling and dimensioning methods in designs	II, III
5	Understanding of three-dimensional design views and perceptions of the different axes	III
6	Completion of the design by making use of existing design views	IV
7	Introduction of Computer Aided Design (CAD) programs, basic commands	V
8	New product development, layout plans, design processes	II, V
9	CAD programs commands, modification commands	V
10	Styles used in CAD programs, dimensioning	V
11	Realization of designs from three axes	III, V
12	Drawing and developing new product designs with CAD programs	IV, V
13	Introduction to production lines layout design, machine park design	IV, V
14	Understanding modern production systems and their developments, developing new product designs	V