

Course Code and Title	Summary of Objectives, Significance, and Student Learning Outcomes
ETM101 Introduction to Design Engineering	This course aims to introduce students to the engineering profession, ethical values, and the fields of design engineering. Understanding the role of design in innovative and sustainable development is of great importance for laying the foundations of professional development. Students will gain the ability to plan and execute design projects at a foundational level. Additionally, their skills in identifying complex problems and developing solution approaches will be strengthened. By the end of the course, students will have gained a comprehensive understanding of the responsibilities and scope of a design engineer.
ETM103 / ETM104 Technical Drawing 1-2	This course aims to introduce students to the engineering profession, ethical values, and the fields of design engineering. Understanding the role of design in innovative and sustainable development is of great importance for laying the foundations of professional development. Students will gain the ability to plan and execute design projects at a foundational level. Additionally, their skills in identifying complex problems and developing solution approaches will be strengthened. By the end of the course, students will have gained a comprehensive understanding of the responsibilities and scope of a design engineer.
ETM105 / ETM 106 Basic Design 1-2	This course aims to develop the communication skills necessary to share design concepts and constraints with stakeholders. The ability to effectively convey designs using technical drawing terminology is of critical importance for the production process. Students gain the ability to correctly interpret engineering drawings and create technical documents. Additionally, they gain an understanding of the responsibilities and authorities of a design engineer. By the end of the course, students will have reinforced their ability to ensure traceability and provide feedback throughout the design process.
ETM107 Freehand Sketching and Drawing Techniques	The primary objective of the course is to provide students with in-depth knowledge of fundamental design principles and elements. Learning creative problem-solving approaches is critical for ensuring aesthetic and functional integrity in the product development process. Students gain the ability to create original designs within specific constraints and develop problem-definition skills. While teamwork competencies are developed, students also learn verbal and visual communication methods. By the end of the course, students come to understand the importance of curiosity and lifelong learning in the field of design.
ETM201 Materials Science	This course aims to help students understand the creative process of design and develop the ability to translate mental imagery onto paper. Strengthening visual thinking and spontaneous expression skills is vital for a designer to quickly bring ideas to life. Students learn fundamental art concepts such as light and shadow, proportion, and perspective through hands-on practice. Students gain the ability to understand different visual styles and evaluate aesthetic values. As a result, complex ideas are effectively visualized using quick-sketching techniques.
ETM202 Manufacturing Technologies	This course aims to teach fundamental manufacturing methods—such as casting, forging, and welding—from both technical and practical perspectives. Understanding the process of transforming engineering designs into physical products is vital for creating manufacturable designs. Students will gain proficiency in using machining methods, measurement and inspection tools, and basic hand tools. They will also develop the ability to identify defects in manufacturing processes and refine their application methodologies. By the end of the course, students will have acquired a practical foundation that enables them to integrate manufacturing technologies into their designs.
ETM203 Statics	The aim of the course is to foster an understanding of material selection by identifying the fundamental physical, chemical, and mechanical properties of materials. Material properties play a decisive role in design, particularly in terms of a product's durability and functionality. Students will gain the ability to evaluate the structure-property relationships of metals, ceramics, polymers, and composites. Additionally, by learning about types of corrosion and protection methods, they will develop material-focused solutions to design problems. By the end of the course, students will acquire the ability to select the most suitable material for a product and measure its behavior.
ETM204 Strength of Materials	The objective of this course is to perform stress and strain analyses of structural members subjected to axial loading, torsion, and bending. This course is of critical importance for maintaining structural integrity and determining safety factors in mechanical design. Students will gain the ability to perform stress calculations for elastic bodies and apply Hooke's law. They will acquire the skill to determine principal stresses under combined loading conditions and use the Mohr circle. By the end of the course, students will develop the capacity to perform stability analysis and evaluate the buckling conditions of structures.
ETM206 Design for X	This course aims to teach systematic design approaches tailored to customer expectations and production methods. The integration of criteria such as ergonomics, reliability, cost, and sustainability into the design process is indispensable for modern industry. Students gain the ability to perform manufacturability analysis and define the product lifecycle. They also understand the impact of post-design processes, such as quality control and packaging, on the design. Ultimately, students acquire the ability to redesign complex mechanical systems within specific standards.

ETM208 Mechanisms	The objective of the course is to teach the types of motion and mechanism approaches necessary for basic machine design. Being able to determine the degrees of freedom and perform kinematic analysis of mechanisms is a fundamental step in the design of moving systems. Students will gain the ability to identify mechanisms such as the crank-connecting rod and four-bar mechanisms and determine their applications. They will develop the ability to apply mathematical theorems for position, velocity, and acceleration analyses. By the end of the course, students will be able to select and design mechanisms suitable for specific operating conditions.
ETM210 Electronics for Product and System Design	The primary objective of the course is to teach the use and importance of electrical and electronic systems in industrial product design. In today's world of smart products, the ability to analyze electronic circuits is a strategic necessity for design engineering. Students will gain the ability to understand basic electrical circuits and effectively incorporate these systems into their designs. The course focuses on the functions of electronic components and the implementation of simple circuit designs. As a result, students acquire the fundamental engineering skills needed to incorporate electronic functionality into their industrial designs.
ETM212 Computer-Aided Design 1	This course aims to teach students the principles of 2D drafting and 3D solid/surface modeling through hands-on practice. In the modern engineering world, verifying and documenting ideas in a digital environment is critical for design efficiency. Students will be able to create complex assemblies and technical drawings using software such as SolidWorks and AutoCAD. Advanced techniques such as assembly analysis, motion simulations, and sheet metal design are covered. As a result, students will gain the ability to prepare professional design documents in accordance with engineering standards.
ETM303 / ETM 304 Machine Elements 1-2	The objective of the course is to teach computational approaches for basic machine components and to integrate them into the design process. Strength analyses of fasteners (rivets, welds, bolts) are of great importance for building reliable machines. Students analyze material behavior and stress theories under static and dynamic loading conditions. Engineering calculation methods are used to determine which component should be used where. By the end of the course, students will have strengthened their ability to design and select machine components based on operating conditions.
ETM305 Product Design and Development	This course aims to foster the generation of innovative design ideas and the successful implementation of a complex engineering project. The development of products that are suitable for the target audience, sustainable, and aesthetically pleasing is of vital importance for maintaining competitiveness in the industry. Students undertake a comprehensive project encompassing the stages of needs analysis, conceptual design, and detailed design. They gain hands-on experience with prototyping, structural analysis, and design for manufacturing (DFM) techniques. By the end of the course, students' ability to prepare and present professional-level design reports is elevated to an advanced level.
ETM306 Applied Product and System Design	This course aims to provide hands-on experience in managing all stages of a complex engineering project, from the conceptual phase through to prototyping. Translating innovative design ideas into tangible solutions within real-world constraints is critical to students' professional readiness. Students will carry out strategic design steps such as needs analysis, market research, and concept development. System modeling, simulation, and technical documentation processes are conducted using CAD and CAE tools. Additionally, design validation through prototype production and testing phases helps students develop effective presentation techniques.
ETM307 Computer Programming	The primary objective of the course is to develop students' algorithmic thinking and coding skills for solving engineering problems using MATLAB. Data analysis and the automation of iterative processes are of great importance for the accuracy and speed of complex calculations. Students will gain proficiency in matrix operations, creating function files, and utilizing decision structures. They will learn to transfer engineering calculations to a computer environment and acquire a foundation in basic coding discipline. By the end of the course, students will have established the fundamental framework needed to solve technical problems using programming tools.
ETM308 Creativity and Innovation	The aim of the course is to teach students creative thinking techniques and the TRIZ (Theory of Inventive Problem Solving) methodology. Being able to bring innovative approaches to complex design problems is of great importance for making a difference in modern industry. Students will develop the ability to solve technical problems using TRIZ tools such as the contradiction matrix and the 40 principles of solution. Their skills in flexible thinking, risk-taking, and viewing problems from different perspectives will be strengthened. As a result, students will gain the ability to apply leadership and communication strategies that foster creativity in the workplace.
ETM309 Systematic Design	This course aims to comprehensively teach the fundamentals of technical systems and all stages of the systematic design process. Analyzing complex systems using a structured methodology is essential for ensuring that the design is error-free and efficient. Students specialize in product planning, defining task specifications, and preparing requirement lists. Through the application of problem-solving methods and the conceptual design process, the relationships between system components are evaluated. By the end of the course, students gain the ability to systematically analyze efficiency, safety, and sustainability criteria in their designs.

ETM310 Graduation Project Preparation	The primary objective of the course is to manage the preparation process by establishing the necessary scientific and technical foundation for the graduation project. Determining the project topic and planning the methodology are the most critical stages for a successful final project. Students develop their research skills in areas such as literature review, database usage, and scientific writing conventions. Fundamental engineering planning tasks, such as project management, risk analysis, and cost calculations, are carried out during this phase. Ultimately, students complete the process by documenting the action plans and technical infrastructure required for their final theses.
ETM402 Sonlu Elemanlar Analizi	This course aims to teach the modeling and simulation of engineering problems using numerical analysis methods (FEA). Predicting stresses and deformations in a product before it is manufactured is critical for cost and time savings. Students will gain the ability to perform structural analyses using spring, beam, and rod elements. Mesh optimization and design improvement studies are conducted using commercial software such as ANSYS. As a result, students will acquire the ability to analyze the performance of complex engineering structures in a digital environment.
ETM404 Design Project Management	This course aims to teach students how to manage a project within budgetary and time constraints using human and physical resources. Skills such as risk management, cost control, and quality management are vital to the commercial success of engineering projects. Students will learn how to prepare project schedules, control design budgets, and manage client relationships. Students will gain proficiency in project team management and the essential qualities of an effective project manager. By the end of the course, students will acquire the ability to conduct economic feasibility analyses of projects and execute management processes using software tools.
ETM410 Graduation Project	This course aims to enable students to design an industrial product by synthesizing all the knowledge they have acquired throughout their education. Solving a complex engineering problem under realistic constraints is the most important step in transitioning to a professional career. Students manage the entire process, from literature review and analysis to design, modeling, and prototype fabrication. The ability to collect experimental or numerical data and interpret results is honed to the highest level. Ultimately, professional competence is demonstrated through a comprehensive thesis and oral presentation that adhere to academic writing standards.