MECHANICAL ENGINEERING (ME)

ME 176 Mechanical Engineering Freshman Design 1 Hour
An introduction to mechanical engineering. The design process and basic professional tools are introduced through multiple projects. Permission of instructor only.
Prerequisite(s): (MATH 117 (may be taken concurrently) or MATH 136 (may be taken concurrently) or MATH 137 (may be taken concurrently) or MATH 237 (may be taken concurrently) or MATH 331 (may be taken concurrently))
Recent Term(s) Offered: spring 2022; fall 2022; spring 2023; fall 2023; spring 2024; fall 2024

ME 180 Freshman Design II 3 Hours
A continuation of the engineering design process, with an emphasis on electromechanical design and the use of professional engineering tools. Virtual and rapid prototypes will be developed through a series of integrated projects. Basic concepts in engineering experimentation will be introduced.
Prerequisite(s): ME 176 with a minimum grade of C and MATH 136 with a minimum grade of C
Recent Term(s) Offered: spring 2022; fall 2022; spring 2023; fall 2023; spring 2024; fall 2024

ME 200 Sophomore Design 3 Hours
Enhances design abilities through individual and team design projects, develops structured problem-solving techniques and written, oral and graphical communication skills. Note: Pre Major must be satisfied in iCAP.
Prerequisite(s): ME 180 with a minimum grade of C
Recent Term(s) Offered: spring 2022; fall 2022; spring 2023; fall 2023; spring 2024; fall 2024

ME 220 Engineering Thermodynamics I 3 Hours
Fundamental principles of thermodynamics, first law, physical properties, ideal and real gases, second law, reversibility and irreversibility, and consequences of thermodynamic cycles.
Prerequisite(s): (EM 221 or EM 222) and MATH 237 (may be taken concurrently)
Recent Term(s) Offered: winter 2022; fall 2022; winter 2023; fall 2023; summer 2024; fall 2024

ME 240 Materials and Methods of Manufacturing 3 Hours
Introduction to the science of engineering materials including structures from the atomic to macroscopic scales, properties, strengthening mechanisms, phase diagrams, and correlation between processing and properties. Introduction to manufacturing process selection and properties of materials.
Prerequisite(s): MATH 136 and (CHEM 116 with a minimum grade of C or CHEM 120 with a minimum grade of C)
Corequisite(s): ME 241
Recent Term(s) Offered: spring 2022; fall 2022; spring 2023; fall 2023; spring 2024; fall 2024

ME 241 Materials and Methods of Manufacturing Lab 1 Hour
Laboratory supporting ME 240. Experiments to develop understanding of materials science, engineering material properties and relationships between processing and properties. Exposure to manufacturing methods through experimentation and observation, including field trips to regional sites.
Prerequisite(s): (CHEM 106 or CHEM 121)
Corequisite(s): ME 240
Recent Term(s) Offered: spring 2022; fall 2022; spring 2023; fall 2023; spring 2024; fall 2024

ME 310 Engineering Instrumentation and Experimentation 3 Hours
The use of sensors and instruments to measure the behavior of mechanical systems is explored. Application of sensors, calibration of systems, and methods of data collection and analysis are covered with an emphasis on uncertainty analysis. Application of principals explored in corequisite laboratory, ME 347.
Prerequisite(s): EM 303 and EE 210 (may be taken concurrently)
Corequisite(s): ME 347
Recent Term(s) Offered: spring 2022; spring 2023; fall 2023; fall 2024

ME 321 Engineering Thermodynamics II 3 Hours
Gas mixtures, air-water vapor mixtures. Air conditioning system design. Principles and design of energy conversion devices, power and refrigeration cycles. Principles of combustion, chemical equilibrium, one-dimensional gas dynamics. Nozzle design. Continuation of ME 220.
Prerequisite(s): ME 220 and MATH 331
Recent Term(s) Offered: spring 2023; spring 2024

ME 325 Elements of Heat Transfer 4 Hours
Discussion of basic physical laws of heat transfer including steady-state and transient heat flow; one-,two-and three-dimensional heat conduction in solids, free or forced convection in fluids, radiation and phase change. Analysis of heat exchangers.
Prerequisite(s): ME 330 and MATH 331
Recent Term(s) Offered: fall 2022; fall 2023; fall 2024

ME 330 Fluid Mechanics 3 Hours
An introduction of physical laws governing the mechanical behavior of liquids and gasses, with applications of conservation of mass, energy and momentum equations. Topics include fluid statics, internal and external fluid flow, flow measurement, scale modeling and similtude, hydraulic machinery analysis and pipe networks.
Prerequisite(s): ME 220 with a minimum grade of C and MATH 331 (may be taken concurrently) and MATH 237
Corequisite(s): ME 332
Recent Term(s) Offered: spring 2022; spring 2023; summer 2023; spring 2024

ME 332 Fluid Mechanics Laboratory 1 Hour
An applied laboratory in the modeling, prediction, and measurement of fluid mechanics components and systems, with emphasis on the preparation of engineering reports, uncertainty analysis, and the experimental design plan process. System level experiments include fluid property measurements, pipe flow and turbomachinery characteristics.
Prerequisite(s): ME 310
Corequisite(s): ME 330
Recent Term(s) Offered: spring 2024

ME 344 Mechanical Design 3 Hours
Fundamentals of design with methods of approximation. Introduction to optimum design considerations. Synthesis and problems on the design of various mechanical elements.
Prerequisite(s): EM 303 with a minimum grade of C and ME 240 with a minimum grade of C
Recent Term(s) Offered: spring 2022; fall 2022; fall 2023; fall 2024

ME 347 Mechanical Systems Laboratory 1 Hour
Implementation of fundamental principles and physical laws governing the response of mechanical system components to external forces and constraints. Students will learn how to plan, conduct, and report on a variety of experiments and projects to measure the performance characteristics of mechanical systems.
Prerequisite(s): ME 241
Corequisite(s): ME 310
Recent Term(s) Offered: spring 2022; spring 2023; fall 2023; fall 2024

ME 492 ME Internship Project 1 Hour
This independent project class will be used to propose and complete the project scope, project execution schedule, and budget/resources needed to execute an internship project that will replace the traditional ENGR491 senior experience. The student will work with an ME faculty member and their company sponsor for the project to develop the project deliverables, approve the document, and confirm support for the project.
Restriction(s): Enrollment is limited to students in Mechanical Engineering (543)
Recent Term(s) Offered: fall 2024

ME 494 WKU ME Selected Topics 2 Hours (repeatable max of 6 hrs)
Advanced special topics delivered in the fall semester by WKU faculty to acquaint the undergraduate student with significant problems and developments of current interest in mechanical engineering. Course is repeatable (with different topics) two times. Note: Permission of instructor is required.
Recent Term(s) Offered: None

ME 495 WKU ME Selected Projects 1 Hour (repeatable max of 3 hrs)
An advanced special project course delivered by WKU faculty to allow undergraduate students the opportunity to execute a relevant project of current interest in mechanical engineering. This course accompanies a ME 494 course, and together will satisfy one technical elective requirement. Course is repeatable (with different topics) two times. Note: Permission of instructor is required.
Recent Term(s) Offered: fall 2023

ME 496 WKU – ME Selected Topics (Fall) 3 Hours (repeatable max of 9 hrs)
Advanced special topics delivered in the fall semester by WKU faculty to acquaint the undergraduate student with significant problems and developments of current interest in mechanical engineering. Course is repeatable (with different topics) two times. Note: Permission of instructor required.
Recent Term(s) Offered: summer 2022; fall 2022; fall 2023; fall 2024

ME 497 WKU – ME Selected Topics (Spring) 3 Hours (repeatable max of 9 hrs)
Advanced special topics delivered in the spring semester by WKU faculty to acquaint the undergraduate student with significant problems and developments of current interest in mechanical engineering. Course is repeatable (with different topics) two times. Note:Permission of instructor is required.
Recent Term(s) Offered: winter 2022; spring 2022; spring 2023; spring 2024