

MECHANICAL ENGINEERING (ME)

 - General Education Course

ME 111 Mech Engineering Computations 3 Credit hours

Introduction to effective problem-solving techniques used in various engineering applications. Computational tools including C and MATLAB will be covered.

Pre-req: MTH 127 with a minimum grade of D or MTH 130 with a minimum grade of D or MTH 132 (may be taken concurrently) with a minimum grade of D or MTH 229 (may be taken concurrently) with a minimum grade of D or MTH 229H (may be taken concurrently) with a minimum grade of D or ACT Math with a score of 24 or SAT Mathematics Before Mar. 16 with a score of 560 or SAT MATH SECTION SCORE with a score of 570.

Concurrent PR: MTH 132 or MTH 229 or MTH 229H

Grade Mode: Normal Grading Mode

ME 240 Manufacturing Processes 3 Credit hours

An introduction to manufacturing systems and strategy. A study of manufacturing processes. Measurement and quality assurance machining, welding, and casting processes. Hot and cold forming and joining processes. 1 lec and 6 lab

Pre-req: ENGR 215 with a minimum grade of D and (ENGR 102 with a minimum grade of D or CE 102 with a minimum grade of D).

Grade Mode: Normal Grading Mode

ME 245 Circuits and Instrumentation 3 Credit hours

This course provides basic concepts of DC and AC circuit analysis, an overview of the instrument characteristics and measurement principles, and description and evaluation of sensors commonly used with instrumentation.

Pre-req: MTH 230 with a minimum grade of D.

Grade Mode: Normal Grading Mode

ME 305 Aircraft Systems 3 Credit hours

This course covers flight dynamics; and modeling, stability, and control aspects of aircrafts.

Pre-req: ENGR 213 with a minimum grade of D.

Grade Mode: Normal Grading Mode

ME 310 Thermodynamics II 3 Credit hours

Gas, vapor, combined power cycles, co-generation, entropy, combustion, fuel cells, and equations of state.

Pre-req: ENGR 219 with a minimum grade of D.

Grade Mode: Normal Grading Mode

ME 312 Flight Mechanics 3 Credit hours

This course covers flight dynamics; modeling, stability, and control aspects of aircrafts.

Pre-req: ME 305 with a minimum grade of D.

Grade Mode: Normal Grading Mode

ME 320 Fluid Power 3 Credit hours

This course covers physical principles of fluid power cylinders, control valves, fluid power components: compressors, pumps, valves, cylinders, and motors, fluid power circuits, troubleshooting: hydraulic, symptoms, procedures, pneumatics.

Pre-req: ENGR 214 with a minimum grade of D and ENGR 216 with a minimum grade of D.

Grade Mode: Normal Grading Mode

ME 325 Mechanical Engineering Lab-I 1 Credit hour

Experiments in fluid, heat, and thermodynamics; Experimental analysis, planning, and design; Estimation of error and uncertainty analysis; Principles and performance of measuring systems; Laboratory experience; Technical report writing.

Pre-req: (ME 360 with a minimum grade of D or ENGR 318 with a minimum grade of D) and ENGR 219 with a minimum grade of D and STA 345 with a minimum grade of D and ME 350 (may be taken concurrently) with a minimum grade of D.

Concurrent PR: ME 350

Attributes: No Textbook Required

Grade Mode: Normal Grading Mode

ME 330 Manufacturing Methods/Design 3 Credit hours

This course covers economical production by understanding the capabilities of different manufacturing processes, candidate manufacturing processes for a given part, performing manufacturability evaluation at the design stage, automation, IMS.

Pre-req: ME 240 with a minimum grade of D.

Grade Mode: Normal Grading Mode

ME 340 Machine Element Design 3 Credit hours

Mechanical design of machine elements, static and fatigue failures, shaft systems, bearings, gears, springs, screws and fasteners.

Pre-req: ENGR 216 with a minimum grade of D.

Grade Mode: Normal Grading Mode

ME 350 Heat Transfer 3 Credit hours

Analysis and solutions of conduction, free and forced convection, radiation heat transfer and design of heat exchangers.

Pre-req: ENGR 219 with a minimum grade of D and (ME 360 with a minimum grade of D or ENGR 318 with a minimum grade of D).

Grade Mode: Normal Grading Mode

ME 360 Fluid Dynamics 4 Credit hours

Fluid statics, fluid kinematics, Bernoulli equation, momentum analysis, dimensional analysis, internal flows, fluid machinery, power and efficiency, external flows, compressible flows, differential analysis and Navier-Stokes equation, computational fluid dynamics.

Pre-req: ENGR 214 with a minimum grade of D and MTH 231 (may be taken concurrently) with a minimum grade of D.

Concurrent PR: MTH 231

Grade Mode: Normal Grading Mode

ME 410 Kinematics & Design of Machine 3 Credit hours

The determination of the motion and forces of machines and mechanisms including rotating machinery, cams and gears. Analyze position, velocity, accelerations, static loads, and dynamic loads.

Pre-req: ENGR 214 with a minimum grade of D and ENGR 216 with a minimum grade of D.

Grade Mode: Normal Grading Mode

ME 420 Control Systems 3 Credit hours

This course provides basic concepts of control; open and closed-loop control systems; and PLC Programming.

Pre-req: ME 245 with a minimum grade of D and MTH 335 with a minimum grade of D.

Grade Mode: Normal Grading Mode

ME 422 Flight Stability and Control 3 Credit hours

This course covers flight dynamics; and modeling, stability, and control aspects of aircrafts.

Pre-req: MTH 335 with a minimum grade of D and ME 312 with a minimum grade of D.

Grade Mode: Normal Grading Mode

- ME 425 Mechanical Engineering Lab-II** **1 Credit hour**
Engineering measurements and experimentations. Hands-on labs and data analyses in several major topics of the Mechanics of Materials theory and Theory of Machines.
Pre-req: ME 340 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 430 Design of Thermal Systems** **3 Credit hours**
Design and analysis of thermal systems including components selection and integrations.
Pre-req: ME 350 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 435 Design of Mechanical System** **3 Credit hours**
Problem solving methodology in the design, analysis, and synthesis of mechanical systems. Engineering design process involving modeling, computer simulation, concepts of optimization, robustness, reliability, sustainability.
Pre-req: ME 410 (may be taken concurrently) with a minimum grade of D.
Concurrent PR: ME 410
Attributes: No Textbook Required
Grade Mode: Normal Grading Mode
- ME 440 Design & Analysis Energy Sys** **3 Credit hours**
Design characteristics and operational performance of energy systems.
Pre-req: ME 310 with a minimum grade of D.
Attributes: No Textbook Required
Grade Mode: Normal Grading Mode
- ME 445 Hydraulic & Pneumatic Control** **3 Credit hours**
This course covers standard symbols, pumps, control valves, assemblies, actuators, filter regulator lubricator (FRL), maintenance procedures, switching, control devices, fluid power circuits including design, application, and troubleshooting.
Pre-req: ME 245 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 447 Engineering Analysis** **4 Credit hours**
Experimental laboratory mainly from within the thermo-fluids area, concerned with fluid statics, flow, heat transfer, internal combustion engines, data acquisition, analysis, including use of computers. Principles of good experimental design.
Pre-req: MTH 335 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 450 CNC and Rapid Prototyping** **3 Credit hours**
This course covers CNC CAD/CAM, CNC tools, coordinate systems, CNC programming Language, CNC operation, CNC tool paths, CNC turning, G/M code reference, CNC milling work-holding, rapid prototyping, 3D printing.
Pre-req: ME 240 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 451 Jet Propulsion** **3 Credit hours**
The theories and principles of jet propulsion. Thermodynamic cycles. The mechanics and thermodynamics of combustion. Turbine engine performance characteristics. Component and cycle analysis of jet engines and turbomachinery.
Pre-req: ME 310 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 452 Capstone Design I** **1 Credit hour**
Prepares mechanical engineering students for ME 453 Capstone Design II, professional responsibility, development of effective communication skills, and learning strategies. Students begin to work on a capstone design project.
Pre-req: ME 350 with a minimum grade of D and ME 410 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 453 Capstone Design II** **3 Credit hours**
Students utilize the engineering design process to complete a comprehensive project that addresses a real-world problem with realistic constraints in a collaborative environment.
Pre-req: ME 452 with a minimum grade of D.
Attributes: Capstone Course
Grade Mode: Normal Grading Mode
- ME 455 Metallurgy** **3 Credit hours**
Covers material properties and behavior of pure metals and common metal alloys. Discuss various aspects of extractive, mechanical, physical metallurgy, theory and practice of identification, selection, processing, conditioning, and testing.
Pre-req: ENGR 215 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 456 Materials for Aerospace** **3 Credit hours**
Covers the main structural materials used in aircraft in terms of their production, properties, performance, and applications.
Pre-req: ENGR 215 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 460 Vibrations** **3 Credit hours**
Modeling of vibratory motion of single and multiple degree of freedom systems; free and forced response; modal summation method for response predictions; simulation of the vibration by using Matlab.
Pre-req: ENGR 214 with a minimum grade of D and MTH 335 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 465 Mechatronics** **3 Credit hours**
Dynamic analysis of mechatronic systems, sensors, transducers, and electric circuits and control.
Pre-req: ME 420 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 471 Finite Elements Method** **3 Credit hours**
This course covers flight dynamics; and modeling, stability, and control aspects of aircrafts.
Pre-req: ENGR 216 with a minimum grade of D and ENGR 335 with a minimum grade of D.
Grade Mode: Normal Grading Mode
- ME 473 Computational Fluid Dynamics** **3 Credit hours**
Conservation laws of fluid motion and heat transfer; Fundamental knowledge to use numerical techniques to solve fluid-thermal problems.
Pre-req: ENGR 335 with a minimum grade of D and (ME 360 with a minimum grade of D or ENGR 318 with a minimum grade of D).
Grade Mode: Normal Grading Mode

ME 475 Introduction to Robotics 3 Credit hours

Introduction to effective problem-solving techniques used in various engineering applications. Computational tools including C and MATLAB will be covered.

Pre-req: ME 410 with a minimum grade of D and ME 420 with a minimum grade of D.

Grade Mode: Normal Grading Mode

ME 480 Special Topics 1-4 Credit hours

Subject matter to be selected from topics of current interest.

Grade Mode: Normal Grading Mode

ME 481 Special Topics 1-4 Credit hours

Subject matter to be selected from topics of current interest.

Grade Mode: Normal Grading Mode

ME 482 Special Topics 1-4 Credit hours

Subject matter to be selected from topics of current interest.

Grade Mode: Normal Grading Mode

ME 483 Special Topics 1-4 Credit hours

Subject matter to be selected from topics of current interest.

Grade Mode: Normal Grading Mode

ME 485 Independent Study 1-4 Credit hours

Individual study of advanced mechanical engineering areas.

Grade Mode: Normal Grading Mode

ME 486 Independent Study 1-4 Credit hours

Individual study of advanced mechanical engineering areas.

Grade Mode: Normal Grading Mode

ME 487 Independent Study 1-4 Credit hours

Individual study of advanced mechanical engineering areas.

Grade Mode: Normal Grading Mode

ME 488 Independent Study 1-4 Credit hours

Individual study of advanced mechanical engineering areas.

Grade Mode: Normal Grading Mode