

Mechanical Engineering (ME)

Courses

ME 211. Mechanical Engineer Tools I. 2 Credits.

An extension of EG 109 with a more in-depth treatment of 3-D solid model generation including extrusion, revolving, sweeping and lofting. Further development and modification of 3-D solid drawings. Laboratory: 3 hours. Prerequisite: EG 109.

ME 307. Thermodynamics II. 3 Credits.

Applications of thermodynamics to power and refrigeration cycles, combustion mechanisms, mixture and flow processes. Development of thermodynamic relationships and equations of state. Classroom 3 hours. Prerequisite: EG 206.

ME 311. Mechanical Engineering Tools II. 2 Credits.

An extension of ME 211 with additional application of computer based design and analysis methods. An emphasis will be placed on design for manufacturing and other tools appropriate to the mechanical engineering profession. Laboratory: 3 hours. Prerequisite: ME 211.

ME 356. Manufacturing Processes. 4 Credits.

A study of the principles of manufacturing processes. Metal removal, casting, joining and deformation processes are covered as well as introductions to numerically controlled machinery, computer-aided manufacturing, rapid prototyping, robotics, computer integrated manufacturing and modern manufacturing systems. Classroom 3 hours, laboratory 3 hours. Prerequisite: ME 311, EG 203.

ME 358. Metallurgy & Manufacturing. 4 Credits.

A study of the principles of physical metallurgy and manufacturing processes. The structure of metals, strengthening mechanisms, metal removal, deformation processes and welding are covered as well as introductions to numerically controlled machinery, computer-aided manufacturing, and robotics. Classroom 3 hours, laboratory 3 hours. Prerequisite: EG 203.

ME 363. Kinematic and Kinetic Synthesis. 3 Credits.

A study of the principles of motion and the forces necessary to cause, and be created by motion. Applications to the design of typical machine elements such as gears, linkages and cams. Classroom 3 hours. Prerequisites: EG 202, MA 223.

ME 368. Design of Machine Elements. 3 Credits.

A study of the application of the theories of mechanics and stress analysis to the design of fundamental machine parts. Some of the topics covered are shafts, springs, screws, belts, gears, rivets, bearings and lubrication. Classroom 3 hours. Prerequisites: EG 301.

ME 370. Mechanical Systems Design. 3 Credits.

An introduction to the methodology of design including problem definition, generation and evaluation of alternatives, and design completion. Emphasis is placed on creativity, feasibility, and the effect of economic and societal factors on alternative selection. Goals are achieved through the use of case studies and small projects. Classroom 3 hours. Prerequisite: junior standing.

ME 381. Mechanical Engineering Laborator I. 2 Credits.

A study of the fundamentals of mechanical and electronic instruments and their use in measurement systems to obtain data on temperature, pressure, displacement, acceleration, and other physical variables. Introduction to experimental methods and procedures, reduction of data to significant form, and the organization of experimental results in written reports. Lecture 1 hour, laboratory 3 hours. Prerequisite: EE 204.

ME 382. Mechanical Engineering Laboratory II. 1 Credit.

Application of instrumentation to observations of gas and liquid behavior, thermo-dynamic and mechanical aspects of machines and devices. Dynamic and transient considerations in instruments, physical systems, and experimental data. Laboratory 3 hours. Prerequisite: ME 381.

ME 435. Vibrations and Controls. 3 Credits.

Synthesis and analysis of mechanical control systems with feedback. Use of linearization techniques and Laplace Transform methods of analysis. Techniques for determining system stability. Emphasis is placed on operational characteristics of components and their effect on system design. Computer simulation of system operation. Classroom 3 hours. Prerequisites: MA 224, EG 202.

ME 465. Heat Transfer. 3 Credits.

A study of the fundamentals of heat transfer by conduction, radiation, and convection. Steady and unsteady state conduction. Study will include boundary layer theory, internal and external convective flows, two-phase flow, and heat exchange design theory. Classroom 3 hours. Prerequisites: EG 206, EG 303, MA 224.

ME 466. Gas Dynamics. 3 Credits.

A course that continues EG 303 as applied to compressible fluids. One and two dimensional flow and oblique shocks. Classroom 3 hours. Prerequisites: EG 303, EG 206. Offered as occasion demands.

ME 467. Mechanical Engineering Design I. 3 Credits.

A capstone design project is taken up to the point of prototype construction, testing and hardware specification. The specific skills and knowledge needed by practicing engineers in the product realization process are emphasized and developed. Classroom 3 hours. Prerequisite: senior standing, ME 370.

ME 468. Mechanical Engineering Design II. 3 Credits.

Design completion of the capstone project initiated in ME 467 including hardware specification, instrumentation, laboratory testing, data reduction, and evaluation. Written design report required with oral presentation and defense. Prerequisite: ME 467.

ME 474. Internal Combustion Engines. 3 Credits.

A course that correlates previous work in thermodynamics, heat transfer and design in the study of internal combustion engines. Classroom 3 hours. Prerequisites: ME 465, ME 307. Offered as occasion demands.

ME 487. Mechanical Engineering Laboratory III. 2 Credits.

A continuation of the Mechanical Engineering laboratory sequence with experiments stressing the performance characteristics of heat power equipment and the application of theory learned in thermodynamics and fluid flow. Classroom 1 hour, laboratory 2 hours. Prerequisite: EG 303. Corequisite: ME 307.

ME 490. Advanced Topics. 3,4 Credits.

A course that provides specific work in an area of the instructor's special competence and indicated student interest. An extension of basic principles to applied areas such as HVAC, heat transfer, thermodynamics, stress analysis, environmental control, turbo-machinery, propulsion systems and aerodynamics. Classroom or seminar, 1-3 hours. Prerequisite: senior standing. Offered as occasion demands.