

ME (Mechanical Engineering)

- ME 2123 Mechanical Systems** **Three hours**
 A study of the history of machines, energy conversion, mechanical elements, loads, prime movers, regulators and converters. An introduction to thermodynamics. Laboratory work and the use of case studies and design projects in engineering mechanical systems. Three hours discussion-design per week. (Same as PHY 2123)
 Prerequisite: PHY 2114
Offered spring semester
- ME 3114 Statics and Strength of Materials** **Four hours**
 A design sequence from applied loads to selection of optimum material, shape, and size for the elements in structures or machines. Forces are resolved in static equilibrium, then elastic or plastic stress analysis is used to assure adequate strength and deflection. Three hours lecture-discussion and one two-hour problem-solving session per week. (Same as PHY 3114) Prerequisite: MTH 1144
Offered fall semester
- ME 3123 Dynamics** **Three hours**
 A vector analysis of the kinematics and kinetics of particles and rigid bodies. Work-energy, impulse and momentum. Modeling with differential equations. Solutions by analog and numerical techniques. Includes the design of an experiment and a machine. Three hours lecture-discussion per week. Prerequisites: ME 3114 and MTH 2114
Offered spring semester
- ME 3213 Thermodynamics** **Three hours**
 A continuation from ME 2123 of the study of the laws of classical thermodynamics with a brief introduction to statistical approaches. Energy conservation in closed and flowing systems. Application to power and refrigeration cycles. Three hours lecture-discussion per week. Prerequisites: ME 2123 and MTH 1144
Offered fall semester
- ME 3501, 3502, 3503 Selected Topics** **One to three hours**
 A study of a special area of mechanical engineering such as fluid induced vibrations, fluidics, rotating machinery, thermal energy converters, viscoelastic materials or quality control. May also be used for credit for internship or independent study.
 Prerequisite: consent of department head
Offered upon sufficient request
- ME 4113 Machine Design** **Three hours**
 Practical application of kinematics, materials mechanics and mechanical processes to the design of machines and machine elements. Static and dynamic load analysis, stress analysis, material selection and failure analysis. Three hours discussion-design per week. Prerequisite: ME 3123
Offered fall semester
- ME 4123 Steel Structures** **Three hours**
 A study of the design of statically determinate and statically indeterminate steel structural elements typically found in buildings. Two hours lecture-discussion and one two-hour laboratory period per week. (Same as CM 4123) Prerequisite: ME 3114 or CM 2323
Offered spring semester (odd-numbered years)

ME 4203 Mechanical Vibrations **Three hours**

A study of the oscillatory motions of bodies and the forces associated with them. Includes the study of undamped and damped, free and forced vibrations, vibration of continuous systems and random vibrations. Prerequisite: MTH 2114

Offered upon sufficient request

ME 4223 Heat Transfer **Three hours**

A study of energy movement due to temperature differences via the mechanisms of conduction, convection, and radiation. Includes a class design project. Three hours lecture-discussion per week. Prerequisite: ME 2123 and MTH 2114

Offered spring semester

ME 4303 Finite Element Analysis **Three hours**

Finite element methods covering fundamental concepts and computer implementation. Topics include solutions of boundary value problems in fluid and solid mechanics with thermal effects and applications to engineering design. Three hours discussion-design per week. Prerequisite: MTH 2114

Offered upon sufficient request

ME 4323 Fluid Mechanics **Three hours**

A study of the conservation of mass, momentum and energy in relation to laminar and turbulent fluid flow. Viscous effects and application to steady and unsteady flow, incompressible and compressible fluids. Includes an individual design project. Two hours lecture-discussion and one two-hour laboratory period per week. Prerequisites or corequisites: MTH 2114, PHY 2124

Offered spring semester

ME 4403 Compressible Flow **Three hours**

Dynamics of flow situations exhibiting appreciable compression. Contained and free flows, boundary layers, shear layers, shock interfaces and thermal effects. Two design projects are required utilizing computational methods. Three hours discussion-design per week. Prerequisite: ME 3213

Offered upon sufficient request

ME 4503 Viscous Flow **Three hours**

Study is pursued for special instances of Navier Stokes solutions, vorticity accounting, creeping, laminar, unstable and turbulent flows. A case study in design is used to compare true viscous behavior with simplified "design" equations. Three hours discussion-design per week. Prerequisite: EN 3224

Offered upon sufficient request

ME 4603 Advanced Thermodynamics **Three hours**

An extension to the thermodynamics taught in ME 2123 and ME 3213 to the realms of analytic, non-equilibrium and statistical thermodynamics. Three hours discussion-design per week. Prerequisite: ME 3213

Offered upon sufficient request

ME 4703 Aerospace Propulsion **Three hours**

A study of aerospace propulsion devices, including jet engines and rockets. Application of compressible flow, thermodynamics, and fluid mechanics to propulsion systems. Corequisite: ME 3213

Offered upon sufficient request