ME 136. Thermodynamics (3)
Prerequisites: CHEM 1A, PHYS 4A, MATH 77, and upper-division standing. Fundamentals of thermodynamics and heat transfer as applied to engineering problems.

ME 137. Turbomachinery (3)
Prerequisites: ME 116 and 136. Applications of fluid mechanics and thermodynamics and rotor-fluid energy interchange. Steady flow problems of pumps, compressors, and turbines with incompressible and compressible fluids. Both closed- and open-ended homework problems.

ME 140. Advanced Engineering Analysis (3)
Prerequisites: MATH 81 or ENGR 101; ECE 71, ME 112 (or concurrently), ME 116 (or concurrently), ME 136 (or concurrently). Development of the finite element method of engineering analysis; specific applications to heat flow, fluid flow, vibrations in mechanical systems, and stresses in mechanical component design using appropriate numerical techniques, closed-form solutions of partial differential equations and the digital computer.

ME 142. Mechanical Vibration (3)
Prerequisites: ME 112. Mathematical and physical basis of vibration theory with applications to engineering analysis and design. Includes transient and steady state phenomena, distributed and lumped parameter systems, coupled systems, and computer solutions.

ME 144. Advanced Mechanics of Materials (3)
Prerequisites: CE 121, ME 125, MATH 81. Advanced topics in mechanics of materials. Statistical considerations in design, stress, and strain theories; contact stresses, strain energy, Castigliano's theorem; failures resulting from static and dynamic loading; static and fatigue theories of failure; stress concentrations.

ME 145. Heat and Mass Transfer (3)
Prerequisites: ME 116, 136, 140. Analytical, numerical, and electrical analogy methods are used to solve a variety of heat transfer and mass transfer problems. Advanced topics in radiation, boundary layer flow, and heat exchanger design.

ME 146. Air Conditioning (3)
Prerequisites: ME 116, 136. Theory and practice in air conditioning including psychrometrics, load estimating, heating and cooling systems, fluid design and controls.

ME 154. Design of Machine Elements (3)
Prerequisites: ME 95, 134. Design of machine elements and components using theory learned in prerequisite courses. Both individual and team-type open-ended design projects are required. Use of computers for design is required. (2 lecture, 3 lab hours)

ME 155. Elements of Systems Design (3)
Prerequisites: ENGR 105W or successful completion of university writing exam, ME 135, 145, 154, 156, senior standing. Design of a commercially feasible mechanical engineering system. Students work in teams to design, build, and test prototype engineering systems using industry-supported projects. Basis of course is formed by meeting realistic constraints, including client-based specification; optimizing designs, working in a team environment, and developing project management skills.

ME 156. Advanced Thermodynamics — Fluid Mechanics (3)
Prerequisites: ME 116, 136. Advanced topics in thermodynamics and fluid mechanics including analysis of solar and nuclear systems as applied to engineering problems.

ME 159. Mechanical Engineering Laboratory (1)
Prerequisites: ME 118, 125, 145, 156 (or concurrently), and senior standing. Analysis of mechanical engineering and measurement systems. Students conduct experiments dealing with advanced thermal and mechanical systems. Using knowledge and experience gained from experimentation, students design and conduct their own group experiments. Both written and oral technical reports are required.

ME 162. Computer-Aided Design (3)
Prerequisites: ME 2, 26, 140, 145 (or concurrently). Survey of computer applications for design, analysis of mechanical systems, and manufacturing of mechanical components. Typical programming language software packages used in industry (CAD/CAM and FEA) will be introduced.

ME 164. Machine Design (3)
Prerequisites: ME 135 (or concurrently), 145, 154; ENGR 105W or successful completion of university writing exam. Open-ended design problems of complete machine systems. Integration of prerequisite course material into final design project. Satisfies the senior major requirement for the B.S. in Mechanical Engineering. (Two 3-hour lecture-labs)

ME 166. Energy Systems Design (3)
Prerequisites: ME 135, 145, 156; ENGR 105W or successful completion of university writing exam. Design of conventional and alternative energy conversion systems, i.e. solar; selection and integration of components of the system; use of codes and standards. Group project report required. Satisfies the senior major requirement for the B.S. in Mechanical Engineering.

ME 180. Special Projects (1-3; max total 3)
Prerequisites: senior standing in mechanical engineering, department-approved writing course or approved subject; successful completion of writing exam. Study of a problem under supervision of a faculty member; final typewritten report required. Individual project except by special permission.

ME 190. Independent Study (1-3; max total 6)
See *Academic Placement — Independent Study.* Approved for ***RP*** grading.

ME 191T. Topics in Mechanical Engineering (1-3; max total 6)
Prerequisite: permission of instructor. Investigation of selected mechanical engineering subjects not in current courses.

ME 193. Mechanical Engineering Cooperative Internship (1-6; max total 12)
Prerequisite: permission of adviser. Engineering practice in an industrial or government installation. Each cooperative internship period usually spans a summer-fall or spring-summer interval. This course cannot be used to meet graduation requirements. *CR/NC* grading only.

GRADUATE COURSES

(See *Catalog Numbering System.*)

Mechanical Engineering (ME)

ME 211. Advanced Dynamics (3)
Prerequisite: ME 134 or permission of coordinator. Dynamics of mechanical systems with emphasis on equations of motion. Kinematics of particles, energy and momentum methods, variational methods, LaGrange's method, kinematics and plane motion of rigid bodies, kinetics of rigid bodies in three dimensions, mechanical vibrations.