

- MENG 201 Mechanical Engineering Drawing (1:6:0)**
3 Semester Credit Hours
 The course introduces the fundamental rules of an international language that enables ideas to be expressed and communicate in an easy and clear way through visual illustration. Includes the following topics: geometric construction; line convention; orthographic projections, Position student feet on the first step of the engineering design based on the visual representation. The course covers the following topics: isometric projections; oblique projections; Perspective projections; dimensioning, and sectional views. Computer software design, Prepare parts drawing and assembly it using the software CREO.
- MENG 211 Thermodynamics I (3:0:0)**
3 Semester Credit Hours -Pre-requisite(s): CHEM 211
 This course will consider the fundamental science of classical thermodynamics and its practical applications. Problem solving will be emphasized, including problem formulation, analytic, and computational solutions. Topics include the first law of thermodynamics, work, heat, properties of substances and state equations, the second law of thermodynamics and applications to engineering systems.
- MENG 212 Thermodynamics II (3:0:0)**
3 Semester Credit Hours -Pre-requisite(s): MENG 211
 This course is a continuation of MENG 211 - Thermodynamics I. It provides more depth in the study of cycles, with applications to gas power and refrigeration cycles, and vapor and combined power cycles; mixtures of gases and vapors, psychrometrics, chemical reactions, and energy analysis.
- MENG 221 Dynamics (3:0:0)**
3 Semester Credit Hours -Pre-requisite(s): CIEN 211
 Kinematics of a Particle, Kinetics of a Particle: Force and Acceleration, Kinetics of a Particle: Work and Energy, Kinetics of a Particle: Impulse and Momentum, Planar Kinematics of a Rigid Body, Planar Kinetics of a Rigid Bodies.
- MENG 231 Engineering Management (2:0:0)**
2 Semester Credit Hours -Pre-requisite(s): CIEN 211
 This course introduces the theory behind engineering measurements. Basic definitions, error analysis, characteristics of mechanical systems, system response and signal analysis. Students will apply the knowledge learned in this course in experiments performed in the BSME program's required laboratory courses.
- MENG 311 Internal Combustion Engines (3:0:0)**
3 Semester Credit Hours -Pre-requisite(s): MENG 212
 Engine classifications and terminology. Engine operating characteristics and performance parameters. Air standard engine cycles including: Otto, Diesel, Dual and two-stroke cycles. Common fuels used in IC engines, combustion reactions and the associated thermochemical calculations. Engine emissions and their control technologies and strategies. Air and fuel induction methods and technologies, the physics of the combustion phenomena. Friction losses, lubricants and lubrication systems.
- MENG 321 Vibration and Control (3:0:0)**
3 Semester Credit Hours -Pre-requisite(s): MATH 214, MENG 221
 Introduction to Vibration, Oscillatory Motion, Free Vibration, Forced Vibration, Rotating Unbalance, Multiple-Degree-of-Freedom Systems, Introduction to control, block diagrams, modeling of systems, state space representation, Laplace transform, solution of linear systems, stability, input/output description, PID controllers, transfer function methods, tracking.
- MENG 342 Fluid Mechanics Lab. (0:3:0)**
1 Semester Credit Hour - Pre-requisite(s): MENG 231
Co-requisite(s): CIEN 251
 This course is composed of a set of selected experiments about general fluid mechanics. The experiments will be either performed in groups by the students or demonstrated by the instructor. Individual class work will be strongly encouraged as well as teamwork. The lab also includes an open-ended design of experiment.
- MENG 361 Heat Transfer (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): MENG 212 (CHEN 312) and MATH 214
 Introduction to heat transfer mechanisms, heat conduction equation, steady heat conduction including the thermal resistance networks, transient heat conduction, lumped systems, fundamental of convection and thermal boundary layers, external and internal forced convection, natural convection, boiling and condensation, thermal radiation, and heat exchangers.

- MENG 362 Thermal Sciences Lab. (0:3:0)**
1 Semester Credit Hour - Pre-requisite(s): MENG 231
CO-requisite(s): MENG 361
This course is composed of a set of selected experiments which demonstrate and apply the concepts of thermodynamics and heat transfer. The experiments will be either performed in groups by the students or demonstrated by the instructor. Individual class work will be strongly encouraged as well as teamwork. The lab also includes an open-ended design of experiment.
- MENG 421 Theory of Machines (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): MENG 221
This course focuses on the kinematic and kinetic analysis of mechanisms. It introduces the fundamental concepts, definitions and terminologies in mechanisms, basic mechanisms and applications, linkages and mobility, dynamic analysis of cams, gears and gear trains, velocity and acceleration analysis in mechanisms, and static and inertia force analysis of machinery.
- MENG 422 Building Utilities II: Illumination, Acoustics, and Electrical Building Services (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): PHYS 110
This course explores building electrical system, building control systems, lighting and acoustic design and assist integrating them into architectural design of the building. Evaluates systems types, components, and installation and maintenance procedures as it relates to building regulations and systems impact human's indoor comfort and on environment.
- MENG 441 Turbo Machinery (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): CIEN 251
Turbomachinery classifications and terminology. Implementation of dimensional analysis for predicting performance of turbomachines and designing engineering systems. Understand the fundamentals of energy transfer between rotating rotors and fluid flow. Demonstrate the ability to construct velocity diagrams for various turbomachines (axial-flow compressors and turbines, radial-flow compressors and turbines, pumps, fans, blowers, hydraulic turbines) and their relation to design. Perform elementary analysis for determining input/output work of various turbo devices. Design and selection of turbomachines for various engineering applications.
- MENG 451 Mechanical Design I (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): CIEN 212, IENG 231
Introduction to Mechanical Engineering Design, Materials Properties, Load and Stress Analysis, Deflection and Stiffness, Failure Prevention, Fatigue Failure, Design of Mechanical Elements, Screws Fasteners and Nonpermanent Joints, Mechanical Springs.
- MENG 452 Mechanical Design II (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): MENG 451
This course is a continuation to the machine design I course. Students will be introduced to the analysis and design concepts of various types of machine elements that include: bearings (journal and anti-friction); spur, helical and bevel gears; flexible drives and flywheels; clutches and brakes.
- MENG 453 Computer Aided Design (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): MENG 451
This is an upper-year mechanical engineering course. It introduces students to the analytical basis to CAD software and the three main ways to represent an entity, namely wireframe, surface and solid modeling. The course aims at introducing the concept and importance of CAD as part of the design process. Also it focuses on mathematical representation and manipulation of geometry. The course introduces students to Computer-Aided Mechanical Design (CAMD) tools and their applications to mechanical systems design.
- MENG 455 Finite Elements in Machine Design (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): MENG 451
The objective of this course is to learn how to design and analyze structural components of machine system, especially using the finite element method. The course exposes students to analytical and numerical methods for computing stresses and strains in structures, use of finite element software for static structural analysis and the application of design and failure criteria to ensure that mechanical components can carry the design load without failure. Another important area of the course is to make the students recognize the importance of self-education and life learning.

- MENG 461 HVAC and Refrigeration Systems (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): MENG 361 and MENG 212
Review of psychrometry. Air conditioning processes. Thermal comfort, inside and outside design conditions. Ventilation and infiltration. Heating and cooling load calculations. Solar radiation. Water heating systems layout and design. Air systems design. Under floor heating. Review of vapor compression and absorption cycles; compressors, condensers, evaporators, expansion devices; refrigerants (including new ones); cooling towers; components of an absorption cycles, controls.
- MENG 462 Design of Thermal Systems (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): MENG 361 and MENG 341
Application of principles of fluid mechanics heat transfer and thermodynamics in the component design of thermal systems. Examples are drawn from power generations, environmental control, and industrial processes such as design and sizing of piping systems, piping networks, pumps sizing and selection, and heat exchangers selection and performance evaluation. Students work individually and on group to conduct assignments and projects for integration of these components in the design of thermal systems.
- MENG 463 Energy Conversion and Management (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): MENG 361
An introduction to the basic technical and economic criteria for the design of efficient energy conversion systems, including traditional as well as alternative power systems. To discuss strategies for increased energy efficiency and more environmentally sound operation. To assess design alternatives and selection criteria based on long-term economic viability and overall energy management strategies.
- MENG 468 Building Utilities I: HVAC and Mechanical Building Services (0:9:0)**
3 Semester Credit Hours - Pre-requisite(s): PHYS 110
This course explores building systems such as heating, ventilating and air-conditioning, water supply, drainage, fire safety and vertical transportation and assist integrating them into architectural design of building. Evaluates systems types, components, and installation and maintenance procedures as it relates to building regulations, systems impact on indoor comfort and environment.
- MENG 491 Senior Design Project I (0:6:0)**
2 Semester Credit Hours - Pre-requisite(s): Senior Standing
The course requires students to work in small design teams to solve a significant engineering problem. Students develop, design, and implement a solution to the engineering problem in conjunction with a faculty advisor. The course reinforces principles of the engineering design process and serves as a capstone for mechanical engineering knowledge obtained in the ME curriculum. The consideration of the ethical and social implications of technology and the basic concepts of business are also aspects of the course.
- MENG 492 Senior Design Project II (0:12:0)**
4 Semester Credit Hours - Pre-requisite(s): MENG 491
The Mechanical Engineering Senior Design Projects Program coordinates the completion of the second half of the capstone design sequence required of all Mechanical Engineering seniors. Students apply engineering design methodology, using both analysis and synthesis, to solve open-ended problems. The range of design problems considered spans other engineering fields as well as non-engineering disciplines. At the end of the term, each student design team is expected to present information related to their project in both written and oral formats.
- MENG 493 Special Topics in Mechanical Engineering (3:0:0)**
3 Semester Credit Hours - Pre-requisite(s): Dept. Approval
Special up-to-date topic in one of the mechanical engineering streams of applied mechanics or thermal sciences.