MECHANICAL ENGINEERING MAJOR (B.S.)

Purpose
The mechanical engineering degree is designed to develop Christ-centered men and women with the values, knowledge, and skills essential to positively influence mechanical engineering-related industries in the current and evolving economy. The program prepares graduates for the thoughtful integration of work and life and to view the mechanical engineering profession as a lifelong commitment to serving others.

Program Educational Outcomes
Our goal is, within a few years of graduating, our Mechanical Engineering students will be able to:

1. Be recognized as creative thinkers and emerging leaders in engineering; exhibiting an aptitude for continuous improvement.
2. Display professional ethics and behavior consistent with foundational Christian principles.
3. Be an invested, contributing, core team member with a focus on customers and a sense for business and innovation.
4. Be an effective communicator for interfacing with diverse audiences.
5. Conduct appropriate checks to produce quality engineering work within acceptable tolerances.

Program of Study
Delivery Format: Residential Only
· Mechanical Engineering (B.S.) - Resident

Career Opportunities
· Quality Engineer
· Mechanical Engineer
· Reliability Engineer

Courses
ENGM 299 Internship 0 Credit Hour(s)
Offered: Resident

ENGM 310 Materials Engineering 3 Credit Hour(s)
Prerequisite: CHEM 121 and ENGR 235 and ENGR 125
A study of the atomic and molecular structure of materials and the effects on their various properties and applications. It provides understanding of how the microstructure composition of materials can be tailored to desired mechanical, electrical, optical, magnetic, and even smart properties. Emphasis is placed on the four most common categories of engineering materials: metals, plastics, ceramics, and composites. It also provides a survey on the abundance, selection, design, manufacturing, and designation of engineering materials.
Offered: Resident

ENGM 350 Computer-Aided Engineering 3 Credit Hour(s)
Prerequisite: ENGR 125 and ENGR 240 and MATH 334 and ENGR 315 (may be taken concurrently) and ENGR 360 (may be taken concurrently)
This course emphasizes on creative design, application of physical laws, and hands-on virtual or physical projects. Review of kinematics/dynamics of commonly used planar mechanisms and programming techniques for motion simulation. Interdisciplinary projects will be assigned to assess students’ design knowledge. Application of computer-aided techniques to the analysis of engineering problems utilizing governing equations of the systems. Students will be exposed to formulations of finite element methods of analysis. Emphasis is placed on practical aspects of structural FE.
Offered: Resident

ENGM 375 Thermal Fluids Design Lab 2 Credit Hour(s)
Prerequisite: PHYS 320 and ENGR 315 and ENGR 360
To reinforce key concepts of thermal-fluid sciences and introduce thermal-fluids system design. To equip students to design and carry out experiments related to thermal-fluids systems, to analyze data, and report results in a professional manner. Students learn to operate equipment such as heat exchangers, centrifugal pumps, ducts and fittings, compressors, refrigerators, valves, dampers, etc. Additionally, students are introduced to thermal-fluids systems in nature. (Formerly ENGM 325)
Offered: Resident

ENGM 415 Design of Machine Components 3 Credit Hour(s)
Prerequisite: ENGR 330
To provide common analytical approaches to design a wide variety of machine components. It emphasizes the engineering mechanics topics of failure theory and analysis. It provides reinforcement of finite element method and computer-aided engineering as techniques and tools to aid machinery design. Topics include: Cam design and analysis; static and fatigue failure theories; surface failure; shafts, keys, and couplings; bearings and lubrication; spur, helical, bevel and worm gears; spring design; screws and fasteners; clutches and brakes. (Formerly ENG 355)
Offered: Resident

ENGM 445 Material and Manufacturing Processing 4 Credit Hour(s)
Prerequisite: ENGM 310
To introduce the physical fundamentals of manufacturing processes; with emphasis placed on those physical principles that are common to several, apparently unrelated, processes. Students learn material selection and processes, especially for metals, plastics, ceramics, and composites. Topics include: geometric attributes of manufactured parts, service attributes of manufactured products, materials in design and manufacturing, machining and nontraditional machining processes, joining processes, surface treatments, manufacturing of semiconductor devices, manufacturing systems, and dynamics of manufacturing in a globalized economy.
Offered: Resident

ENGM 499 Internship 1-6 Credit Hour(s)
Offered: Resident