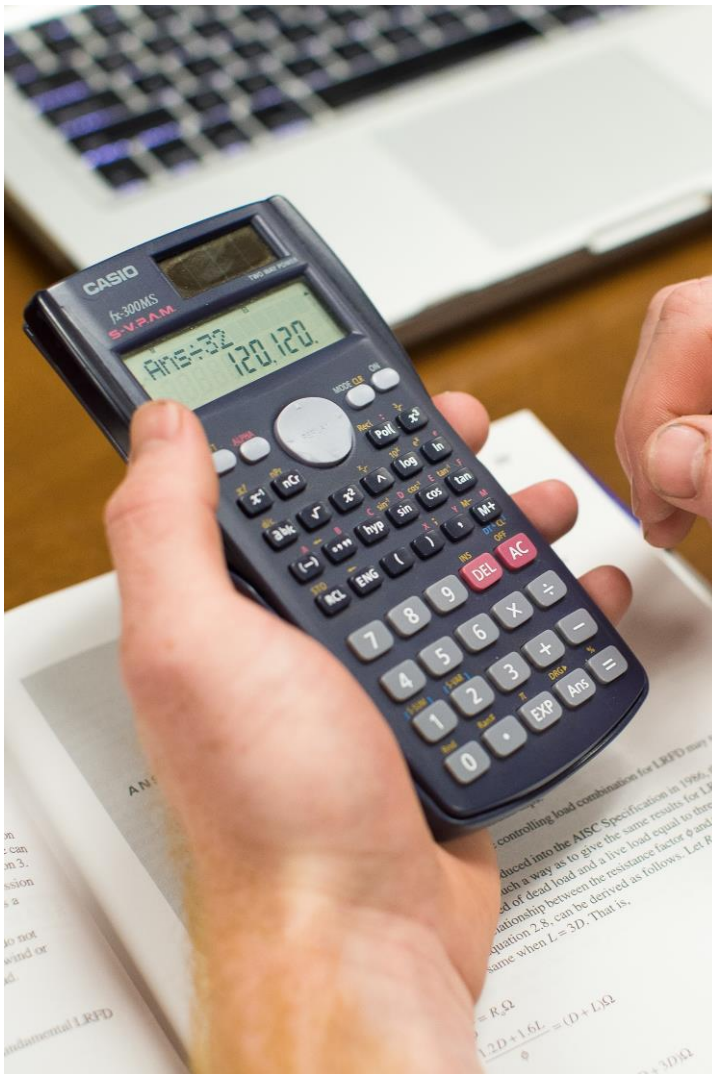


Department of Engineering



Faculty

Fred A. Wentorf, Ph.D.
Department Chair

DEPARTMENT OF ENGINEERING

In order to meet the growing number of students interested in engineering as a major field of study, Grace College offers the Bachelor of Science in Mechanical Engineering degree. Engineering graduates enter the workforce in numerous avenues through tackling the ever increasing demands of increasing the quality of life of our aging population, on our infrastructure and security, utilizing energy production, and designing revolutionary technology.

The program will reap the benefits of being located in the “Orthopedic Capital of the World”. This will include filling the classroom and laboratories with experts in their fields to educate and mentor our students, relevant work experience that is only 5 minutes off-campus, industry-based senior projects, and research projects that relevant to the real-world. This interaction is facilitated by an engaged advisory council of industry experts and growing group of industry leaders that our supporters of the program.

Purpose and Goals of Department of Engineering

The purpose of the department is to promote the application of science and technology by preparing graduates for the practice of engineering at the professional level. The program will:

- Provide high quality, industry relevant, hands-on preparation for the practice of engineering at the professional level.
- Produce well-rounded graduates that are ready to tackle the complicated world of engineering with confidence, humility, and a heart for service.
- Be intimately connected to the community by providing support for the STEM education community in the area and providing technical support for industry in the area.

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Mechanical engineering is, perhaps, the most diverse and general of all the engineering fields. Mechanical engineers can be found working in almost any company. Manufacturing, transportation, health care, and insurance are just a few of the types of firms that employ mechanical engineers. No other field of engineering provides a better professional base for interdisciplinary activities.

Mechanical engineers design machines of all types, from paper clips to space shuttles. They plan, design, and direct the manufacture, distribution, and operation of these machines. Mechanical engineers also design the power sources needed to operate the machines and provide for the environment in which they function. In fact, mechanical engineering involves all phases of energy production and utilization: engines, power plants, electrical generation, heating, ventilating, and air conditioning.

Mechanical Engineering Student Learning Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences

4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Students who choose this option will complete the following 137 credit hour program of study:

General Education Requirements: 46 credits

Grace Core – 39 credits

Other requirements – 7 credits

MAT 3200 Probability & Statistics

CHM 1620 Chemistry I

Major Requirements: 91 credits

Math and Science – 25 credits

MAT 1230/1240 Calculus I and Lab

MAT 1250/1260 Calculus II and Lab

MAT 2250 Calculus III

MAT 2280 Differential Equations

MAT 3130 Linear Algebra

CHM 1610 Lab

PH 2240/2250 University Physics I and Lab

PH 2340/2350 University Physics II and Lab

Mechanical Engineering Science – 24 credits

Mechanical Engineering Fundamentals – 42 credits

Applied Learning credits are met within the core and major requirements – 12 APL

ADMISSION REQUIREMENTS

Bachelor of Engineering (BE):

- Minimum high school GPA of 3.0 and top half of graduating class.
- ACT composite score of at least 21, with at least 23 in the math section.
- SAT minimum combined score of 1060 in the math and reading sections, and at least 560 in the math section.

ACCREDITATION

Grace College is accredited by the Higher Learning Commission.

Grace college is currently only offering the first two years of mechanical engineering courses. The last two years of courses will be included in subsequent catalogs.

COURSE DESCRIPTIONS

ENGINEERING SCIENCE

MEG 2100 Statics and Mechanics of Materials

This course combines statics and mechanics of materials into one course. The static's subjects covered include; force and moment vectors, equivalent systems, trusses, frames, and machines, equilibrium of particles and rigid bodies, static friction, centroids and moments of inertia. The mechanics of materials section teaches the Concepts of stress and strain in engineering materials. Subjects in this section include: Hooke's law and Poisson's relationship, analysis of axial, shear, flexural, and torsional stresses, combined stress, shear and moment distribution in beams, and deformation of structural members. Co-requisite: PH 2240, MAT 1250. Four credits.

ENGINEERING FUNDAMENTALS

MEG 1200 Introduction to Mechanical Engineering

This course will give an overview of the mechanical engineering profession, introduce keys skills used in engineering, and quickly give an overview of Mechanical engineering sciences. Four credit hours.

MEG 1400 Introduction To Programming in MATLAB

This course will begin with an introduction to programming using Matlab. Then dive into the strengths of Matlab that will be used to solve engineering problems. This course will also include an introduction to numerical methods for solving engineering problems. Prerequisite: MAT 1230. Two credit hours.

MEG 1900 Engineering Modeling and Tolerancing

This course will teach graphical communication for engineers starting with the basics fundamentals of engineering drawings, then work significantly on 3D model creation, and end with an introduction to geometric dimensioning and tolerancing. Emphasis is placed on developing the skills needed for mechanical engineering design. Three credit hours.

MEG 1950 Introduction to Manufacturing Processes and Measurements

This course will begin with machine shop safety and then teach the process of running a manual mill and lathe and other common machining tools. The second half of the course will focus on measurements of parameters key to design and manufacturing. Prerequisites: MEG 1900. three credit hour.

MEG 2000 Engineering Internship

This course will include journaling and other activities during an internship working as a professional engineer. One credit hour.