

MECHANICAL ENGINEERING (M)

Mechanical Engineering is a broad engineering discipline that involves design and development, and analysis and control of devices and systems. The discipline addresses solids, fluids and materials/manufacturing from fundamentals to specialization. Your household refrigerator, automobile engine, cam shafts, gear boxes, airplanes, solar panels, power plants and many such systems are part of mechanical engineering curricular content. Finite element method will be employed for stress analysis of machine components and similarly energy systems are evaluated using computational fluid dynamics.

With foundation in chemistry, physics and math, the curriculum includes mechanics (statics and dynamics), material science, thermodynamics, fluid mechanics, heat and mass transfer, manufacturing processes and strength of materials, system dynamics and instrumentation, machine design, process dynamics and control to prepare you for a versatile career in various fields such as energy, aerospace, transportation, manufacturing, robotics and much more.

The Concordia University Wisconsin Bachelor's of Science in Mechanical Engineering program will provide students with technical and creative problem-solving skills that meet professional expectations. The curriculum will be grounded in a Christian approach to making the world safer, healthier and more efficient.

The Mechanical Engineering program consists of 133 credits, completed over eight semesters. Students will practice skills with hands-on experiential learning opportunities in modern labs, under the supervision of qualified and experienced faculty. Students will complete a capstone design project and are strongly encouraged to complete an internship. The total typical time to complete the program is four years. No minor will be required for mechanical engineering students as the program is credit heavy. Concordia University will seek to have its B.S. Mechanical Engineering program accredited by the Accreditation Board of Engineering and Technology; the application is due upon the graduation of the first cohort.

Based on the University Mission and the Engineering programs mission, the Program Educational Objectives of the Mechanical Engineering program are to produce graduates who during their professional career will be:

PEO1: Productive Contributors with strong skills in teamwork and communication.

PEO2: Creators of value in product or process or service with a commitment to professional growth.

PEO3: Holistic, impactful and responsible professional members of society.

Program Learning Outcomes

Students will:

- identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 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.

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

Curriculum

Code	Title	Hours
Core Requirements (https://catalog.cuw.edu/undergraduate/university/acad-prog/trad/core/)		45
Major Requirements (Basic Sciences and Mathematics 28 + Discipline 54)		82
Elective		6
Minor: Optional		
Total Hours		133

Major Requirements

Code	Title	Hours
Required Core Courses		
CHEM 1414	General Chemistry I	
MATH 2050	Statistics I	
<i>Required Basic Sciences and Mathematics Courses (28 credits)</i>		
CHEM 1424	General Chemistry II	4
MATH 2010	Calculus I	4
MATH 2020	Calculus II	4
MATH 2030	Calculus III	4
MATH 3250	Linear Algebra and Differential Equations	4
PHYS 1714	University Physics I	4
PHYS 1724	University Physics II	4
<i>Required Discipline Courses (54 Credits)</i>		
ENGR 1010	Engineering Introduction, Design and Ethics	3
ENGR 1020	Engineering Applications and Programming	3
ENGR 2210	Statics	3
ENGR 2220	Dynamics	3
ENGR 2230	Material Science	3
ENGR 2320	Thermodynamics	4
ENGR 2410	Engineering Economics	3
ENGR 3210	Manufacturing Processes and Strength of Materials	4
ENGR 3220	Systems Dynamics and Instrumentation	3
ENGR 3240	Machine Design	4
ENGR 3310	Heat Transfer	4
ENGR 3330	Fluid Mechanics	4
ENGR 3460	Project Management	3
ENGR 4210	Process Dynamics & Control	4
ENGR 4971	Mechanical Engineering Capstone Design Project I	3

ENGR 4972	Mechanical Engineering Capstone Design Project II	3
<i>Elective (Select two of the following courses, 6 credits)</i>		6
Engineering Elective (Any ENGR 3000/4000 course)		
ENGR 3120	Mass Transfer	
ENGR 3490	Statistical Process Control	
ENGR 4991	Internship Experience	
Total Hours		88

Plan

Course	Title	Hours
Semester 1		
CHEM 1414	General Chemistry I	4
MATH 2010	Calculus I	4
ENGR 1010	Engineering Introduction, Design and Ethics	3
ENG 1040	Introduction to Writing	3
CCE 1010	Christian Citizen	3
Hours		17
Semester 2		
ENGR 1020	Engineering Applications and Programming	3
MATH 2020	Calculus II	4
REL 1000	The Bible	3
MATH 2050	Statistics I	3
CHEM 1424	General Chemistry II	4
Hours		17
Semester 3		
PHYS 1714	University Physics I	4
ENGR 2210	Statics	3
MATH 2030	Calculus III	4
ENGR 2230	Material Science	3
REL 1100	Christian Faith	3
Hours		17
Semester 4		
MATH 3250	Linear Algebra and Differential Equations	4
PHYS 1724	University Physics II	4
ENGR 2220	Dynamics	3
ENGR 2320	Thermodynamics	4
HHP 1100	Stewardship of the Body	1
HHP ACTIVITY COURSE		1
Hours		17
Semester 5		
ENGR 3120 or ENGR 3490 or ENGR 4991	Mass Transfer or Statistical Process Control or Internship Experience	3
ENGR 3330	Fluid Mechanics	4
ENGR 3210	Manufacturing Processes and Strength of Materials	4
CCE 1020	Western Culture & Worldview	3
SOCIETY & CULTURE - COMM 4100 RECOMMENDED		3
Hours		17
Semester 6		
ENGR 3220	Systems Dynamics and Instrumentation	3
ENGR 3310	Heat Transfer	4
ENGR 3240	Machine Design	4
COMMUNICATION & LANGUAGE - COMM 3300 RECOMMENDED		3
CCE 1030	Western Thought & Worldview	3
Hours		17
Semester 7		
ENGR 4971	Mechanical Engineering Capstone Design Project I	3
ENGR 3120 or ENGR 3490 or ENGR 4991	Mass Transfer or Statistical Process Control or Internship Experience	3

ENGR 3460	Project Management	3
CCE 1040	Science & Humanity	3
FAITH & LIFE		3
Hours		15
Semester 8		
ENGR 4972	Mechanical Engineering Capstone Design Project II	3
ENGR 4210	Process Dynamics & Control	4
ENGR 2410	Engineering Economics	3
HUMAN CREATIVITY & EXPRESSION - GD 1500 RECOMMENDED		3
HUMAN BEINGS & BEING HUMAN - PHIL 2210 OR PHIL 3090 RECOMMENDED		3
Hours		16
Total Hours		133

Course options and schedule are subject to change.