

# DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING

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Department website: <https://www.uwplatt.edu/department/mechanical-industrial-engineering> (<https://www.uwplatt.edu/department/mechanical-industrial-engineering/>)

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## ABOUT THE DEPARTMENT AND MAJORS

The UW-Platteville Department of Mechanical and Industrial Engineering offers two Bachelor of Science degrees: Mechanical Engineering and Industrial and Systems Engineering. The two disciplines have complementary aspects and provide opportunities for close cooperation between them. The department's mission is to provide an open, student-friendly environment with frequent student-faculty interaction that results in a high quality undergraduate mechanical and industrial and systems engineering education and enables graduates to practice their profession with proficiency and integrity.

### MAJORS

- Industrial and Systems Engineering (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/industrial-engineering-bs/>)
- Mechanical Engineering (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/mechanical-engineering-bs/>)
- Mechanical Engineering with Biomedical Engineering Emphasis (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/mechanical-engineering-biomedical-engineering-emphasis-bs/>)
- Mechanical Engineering with Manufacturing & Design Emphasis (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/mechanical-engineering-manufacturing-and-design-emphasis/>)

## INDUSTRIAL AND SYSTEMS ENGINEERING

<https://www.uwplatt.edu/department/mechanical-industrial-engineering> (<https://www.uwplatt.edu/department/mechanical-industrial-engineering/>)

University of Wisconsin Platteville's B.S. program in Industrial and Systems Engineering is accredited by the Engineering Accreditation Commission of ABET, <https://www.abet.org> (<https://www.abet.org/>), under the commission's General Criteria and the Program Criteria for Industrial and Similarly Named Engineering Programs.

Industrial and systems engineering is concerned with the design, improvement and installation of integrated systems of people, materials and technology. Industrial and systems engineers combine the knowledge of mathematics, physical science and social science with the principles and methods of engineering analysis and design to predict system behavior and decision-making. They are employed by both manufacturing and services industries with many working in the domains of manufacturing, healthcare, energy, finance, logistics and transportation.

Industrial and systems engineers are generalists rather than specialists. Therefore, the Industrial and Systems Engineering curriculum at UW-Platteville covers a broad range of topics related to engineering practice. It includes study in engineering science topics as well as in the major areas within industrial and systems engineering. These areas include ergonomics, work design, systems design, facility design, inventory and production planning, quality, engineering management and continuous improvement. In addition, students are required to fulfill general university requirements in the humanities, physical sciences, social sciences and other areas. The main purpose of the Industrial and Systems Engineering curriculum is to prepare new engineers to practice at the frontiers of engineering knowledge and professional practice immediately after graduation.

### PROGRAM EDUCATIONAL OBJECTIVES

Within four to six years after graduation, our graduates will

- (1) add significant value to their organizations by implementing improvements through application of system, process and management methodologies and tools
- (2) provide formal and informal project, administrative or technical leadership

(3) engage in professional growth through post-graduate education, certifications and professional societies

## STUDENT OUTCOMES

By graduation, students in our program are expected to attain the following student outcomes:

- (1) an ability to identify, formulate and solve complex engineering problems by applying the 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.

## INDUSTRIAL AND SYSTEMS ENGINEERING ACADEMIC STANDARDS

A 2.00 /4.00 G.P.A. must be maintained in all professional engineering courses.

## GENERAL REQUIREMENTS BACHELOR OF SCIENCE DEGREE

Course	Title	Credits
Total for graduation		123-126
Major studies		98-99

## MECHANICAL ENGINEERING

<https://www.uwplatt.edu/departments/mechanical-industrial-engineering> (<https://www.uwplatt.edu/departments/mechanical-industrial-engineering/>)

University of Wisconsin Platteville's B.S. program in Mechanical Engineering is accredited by the Engineering Accreditation Commission of ABET, <https://www.abet.org> (<https://www.abet.org/>), under the commission's General Criteria and the Program Criteria for Mechanical and similarly Named Engineering Programs.

Mechanical engineers meet the needs of society in many important ways, including the creative planning, development, and operation of mechanical systems considering sustainability factors such as cost and the environment; the commercial conversion of energy to provide heat, refrigeration, and power; and the design and manufacture of consumer products that fulfill societal needs. They work in a variety of areas such as manufacturing, design, development, research, sales, and management. The B.S. program in Mechanical Engineering also provides an excellent background for those seeking advanced degrees in biomedical engineering, aerospace engineering, and business administration.

The main purpose of the Mechanical Engineering curriculum is to develop in each student a thorough understanding of fundamental theory, augmented and illustrated by practical application. It provides a balance between engineering science and engineering design, complemented with a strong liberal arts education. Faculty members are dedicated to providing students with the personal attention needed for maximum development of skills.

UW-Platteville also delivers its mechanical or industrial and systems engineering program to students at a distance. Students take the mechanical or industrial and systems engineering courses taught by UW-Platteville faculty members through online asynchronous lectures combined with hands-on lab experiences where needed. Students obtain the same B.S. degree as students taking courses at Platteville.

Mechanical engineering promotes high impact practices. Many students earn credit by engaging in undergraduate research under faculty mentorship, participating in internships, or completing cooperative education assignments. Study abroad programs and foreign exchanges are also encouraged. Students anywhere in the world may take certain professional engineering courses at UW-Platteville via distance learning technology, enabling them to progress more rapidly towards degree completion while away from campus.

The Biomedical Engineering emphasis in Mechanical Engineering concentrates on the human-device interface. Uses of this theory include the design and development of medical equipment as well as artificial body parts. More specifically, the Biomedical Engineering emphasis expands on the three areas of mechanical engineering, which are (1) mechanics and materials, (2) motion, and (3) energy. In mechanics and materials, students learn about how materials are formed and processed, how materials interact, and how they deform or break. Biomedical engineers might ask the question, could an artificial hip be developed that would not be rejected by the human body, but have a 50 year life? In motion studies, the biomedical engineer would

be concerned with the kinematics of the human body. Could a mechanical knee be developed that would mimic the motion of a human? The study of energy concepts include fluid flow, which would be necessary to understand how blood flows through the human body.

The curriculum of Mechanical Engineering with a Biomedical Emphasis is very similar to the Mechanical Engineering curriculum. Rather than taking technical electives, however, students are required to take courses in biofluids and biosolids. Additionally, students must take a biology course and an introduction to biomedical engineering course. The final distinction is that students must take a measurements course that is specifically designed for biomedical engineers. The advantage of this degree is the breadth and number of options that it affords the student. Students have all of the choices typically available to mechanical engineers, but they are also well prepared to enter the field of biomedical engineering.

## PROGRAM EDUCATIONAL OBJECTIVES

Within five years after graduation, our graduates will

- (1) build upon and adapt knowledge of science, mathematics and engineering to solve more complex problems and take on more expansive projects that require an increased level of technical expertise, business acumen, flexible team engagement and leadership
- (2) incrementally leverage their work experiences to develop improved communication with appropriate modality, message, and timing; their messages will increasingly take into account the stakeholder's culture, technical expertise, organizational role, values, and identity
- (3) be capable and integrated, contributing team members, who: strategically provide leadership; are aware of stakeholders within and outside of their organization; and conduct themselves ethically and professionally.

## STUDENT OUTCOMES

By graduation, students in our program are expected to attain the following student outcomes:

- (1) an ability to identify, formulate and solve complex engineering problems by applying the 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.

## MECHANICAL ENGINEERING ACADEMIC STANDARDS

1. Completion of all university and general education requirements
2. Enrolled and in good standing in the Mechanical Engineering program
3. Successful completion of all required courses for the Mechanical Engineering major.
4. A grade point average of 2.0/4.0 in required courses for the Mechanical Engineering major and approved Mechanical Engineering Technical Electives. The method for computing this grade point average is identical to the method used to calculate the university grade point average.

## GENERAL REQUIREMENTS BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING DEGREE

Course	Title	Credits
Total for graduation		124
Major studies		98

## MAJORS

- Industrial and Systems Engineering Major, B.S. (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/industrial-engineering-bs/>)
- Mechanical Engineering Major, B.S. (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/mechanical-engineering-bs/>)
- Mechanical Engineering Major with Biomedical Engineering Emphasis, B.S. (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/mechanical-engineering-biomedical-engineering-emphasis-bs/>)

- Mechanical Engineering Major with Manufacturing & Design Emphasis, B.S. (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/mechanical-engineering-manufacturing-and-design-emphasis/>)

## CERTIFICATES

- Certificate in Systems and Engineering Management
- Interdisciplinary Engineering Design Certificate (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/interdisciplinary-engineering-design-certificate/>)

## FOUR-YEAR PLANS

- Industrial and Systems Engineering Major B.S., Four-Year Plan (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/industrial-engineering-four-year-plan/>)
- Mechanical Engineering Major B.S., Four-Year Plan (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/mechanical-engineering-bs/mechanical-engineering-four-year-plan/>)
- Mechanical Engineering Major with Biomedical Engineering Emphasis, B.S., Four-Year Plan (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/mechanical-engineering-biomedical-engineering-emphasis/bs/four-year-plan/>)
- Mechanical Engineering Major with Manufacturing & Design Emphasis, B.S., Four-Year Plan (<https://catalog.uwplatt.edu/undergraduate/engineering-mathematics-science/mechanical-industrial-engineering/mechanical-engineering-manufacturing-and-design-emphasis/four-year-plan/>)

## FACULTY AND LECTURERS

Additional information about the Faculty and Lecturers below may be found in the Faculty and Academic Staff (<https://catalog.uwplatt.edu/faculty-academic-staff/>) section of this catalog.

Bora, Kamil Can (Jon)

Camacho, Jorge

Chen, Yang

Cox, Bryce

Cyrus, Saman

Fick, Jessica P.

Ghaffari, Seyedeh Sepideh

Gnanaswaran, Vettrivel

Horne, Kyle S.

Iselin, John P.

Katz, Kenneth J.

Lerner, Anne-Marie A.

Ljumanovic, Lea

Natarajan, Ganapathy

Obielodan, John O.

Paruchuri, Venkata Avinash

Prosise, Jodi

Rahman, Md Mamunur

Roy, Bidhan

Sun, Mingman

Teng, Hong

Yu, Paulo V.

Zampaloni, Michael A.

Zolper, Thomas J.