

MASTER OF SCIENCE IN ENGINEERING

Michael Zampaloni, Program Coordinator

Master of Science in Engineering

Address: University of Wisconsin-Platteville

1 University Plaza

Platteville, WI 53818-3099

Phone: 608.342.1561

Fax: 608.342.1566

Email: engineering@uwplatt.edu

STATEMENT OF PURPOSE

The Master of Science in Engineering program provides high-quality, online development opportunities in mathematics, engineering communications, computer applications, management, and select engineering topics.

STUDENT LEARNING OUTCOMES

Graduates will:

1. Demonstrate effective technical, business, and client communication skills;
2. Apply engineering management practices;
3. Contribute to the solution of engineering problems as a member of a local, regional, or international team;
4. Demonstrate advanced competence in at least one technical emphasis area;
5. Demonstrate application of mathematics or statistics for solving engineering, management, or business problems;
6. Use technique, skills, and modern engineering tools necessary for engineering practice;
7. Recognize and respond appropriately to ethical situations.

INTRODUCTION

The Master of Science in Engineering (MSENGR) degree draws on students' existing knowledge of engineering theory and mathematics and on their practical engineering experience. The program requires 31-33 credits of advanced course work.

The program includes core competency courses in mathematics, computer applications, engineering communications, and engineering management. Each student additionally completes a technical emphasis. Currently, students may select an emphasis in engineering design, application in engineering management, control systems, structural/geotechnical engineering, or aerospace manufacturing engineering.

ADMISSION REQUIREMENTS FOR MASTER OF SCIENCE IN ENGINEERING

Admission to the Master of Science in Engineering requires:

- A bachelor's degree in engineering or a related field from a nationally or regionally accredited institution recognized by the Council for Higher Education Accreditation or
- Prerequisite coursework in Calculus

To be eligible for admission in full standing, a student must have an overall undergraduate grade point average of 2.75 or above or 2.90 on the last 60 credits from the degree-granting institution. Students who do not qualify for admission in full standing may be admitted in full standing on probation if justified by the admitting department and approved by the College Dean.

Program entrance requirements and degree completion requirements are consistent with those of the graduate programs of the institution. Students seeking admission to the program should follow the instructions found in the Admission Policies and Procedures section of this catalog.

SPECIAL STUDENTS

Students who have earned a bachelor's degree from a nationally or regionally accredited institution recognized by the Council for Higher Education Accreditation (CHEA) or U.S. Department of Education (USDE) may register as a Special Student. Students will receive academic credit for courses taken while on this status. Students can be considered for admission into a degree program if they maintain a 3.00 grade point average in all graduate-level work and all other admission requirements are met. With the program area advisor's approval, students may transfer up to 12 credits earned at UW-Platteville into a degree program. All graduate-level work will be included in computing a student's GPA.

CURRICULUM

The Master of Science in Engineering is earned upon the successful completion of degree requirements. A total of 31-33 graduate credits, as outlined below, are required. For admission requirements, registration instructions, course descriptions, tuition rate, and a long-term course rotation schedule, visit our web site at <https://www.uwplatt.edu/distance-education> (<http://www.uwplatt.edu/distance-education/>).

All courses are three credits unless otherwise noted. Courses that are cross-listed in more than one section cannot be counted twice. Graduate credits in which a grade lower than a "C-" has been earned will not be counted toward a degree in Engineering; however, these lower grades will be reflected in the student's grade point average.

Course	Title	Credits
Section A: Core Courses		12
Select one course from each of the following areas:		
Mathematics:		
ENGRG 5030 or ENGRG 6050	Linear Algebra Applied Statistics	
Computer Applications:		
INDSTENG 7030 or INDSTENG 7070	Simulation Modeling of Engineering Systems Optimization with Engineering Applications	
Technical Communications:		
MECHENG 5000	Engineering Communications	
Engineering Management:		
INDSTENG 7800	Engineering Management	
Section B: Technical Emphasis ¹		9-12
Select one of the Technical Emphasis areas below.		
Section C: Degree Track		7-12
Select one of the Degree Tracks below. All students are required to complete a Degree Track, which should enhance both the Engineering Core and Technical Emphasis areas. There are three options available, allowing for students to choose which best suits their personal and professional goals. Select one of the following:		
1. Thesis Research Degree Track (7 credits) ^{2,5}		
The Thesis Research Degree Track is designed to advance knowledge in the student's area of emphasis. Under the guidance of a Thesis Advisor and an approved thesis committee, students will conduct in-depth and/or novel research.		
To complete the Thesis Research Degree Track the students must take a Thesis Preparation Course and complete six credits of Thesis Research under a Faculty Advisor:		
CIVILENG/ELECTENG/INDSTENG/ Thesis & Capstone Preparation MECHENG 7900		
and six (6) credits of:		
CIVILENG/ELECTENG/INDSTENG/ Thesis Research MECHENG 7990		
2. Capstone Design Project Degree Track (7 Credits) ^{3,5}		
The Capstone Design Project Degree Track makes the theoretical knowledge gained in the program operational in realistic settings. A capstone should aim to demonstrate the ability to apply what was learned in the graduate courses to an engineering problem utilizing original analysis (qualitative, quantitative, or both), design, and solution implementation of a specific situation to advance expert understanding of the topic.		
To complete the Capstone Design Project Degree Track students must take the Capstone Preparation Course as well as six credits of Capstone Design Project:		
CIVILENG/ELECTENG/INDSTENG/ Thesis & Capstone Preparation MECHENG 7900		
and six (6) credits of:		
CIVILENG/ELECTENG/INDSTENG/ Capstone Design Project MECHENG 7970		
3. Elective Course Degree Track (9-12 credits) ⁴		

The Elective Course Degree Track is designed for those students that want to focus on developing engineering knowledge beyond the Engineering Core and Technical Emphasis areas to enhance their professional and personal skills. Students opting for the Elective Course Degree Track will complete the degree by taking a series of elective courses. Courses listed in Sections A and B which were not previously used to satisfy other requirements may be taken as electives. In addition, the courses listed below may be taken as electives. Additional electives may be available through transfer and/or other arrangements. Contact an academic advisor or the program coordinator for more information.

Additional courses, not listed in sections A or B above, that are eligible for the Elective Course Degree Track:

ENGRG 7930	Special Topics in Engineering
ENGRG 7980	Independent Study in Engineering
PROJMGT 7010	Project Management Foundations
PROJMGT 7020	Leading & Managing Projects, Programs, and Portfolios
ISCM 7100	International Supply Chain Management
or BUSADMIN 6100	Supply Chain Management

Total Credits

31-33

- 1 Students completing an emphasis in Applications in Engineering Management, Engineering Design, or Structural/Geotechnical Engineering must select a total of twelve technical emphasis credits. Students completing an emphasis in Control Systems must complete a total of nine technical emphasis credits.
- 2 Must take six credits of Thesis Research to meet degree requirements. All six credits cannot be taken in the same semester. Only six credits of Thesis Research will count toward degree requirements.
- 3 Must take six credits of Capstone Design Project to meet degree requirements. All six credits cannot be taken in the same semester. Only six credits earned will count toward degree requirements.
- 4 Students completing an emphasis in Applications in Engineering Management, Engineering Design, or Structural/Geotechnical Engineering must select a total of nine elective course credits. Students completing an emphasis in Control Systems must complete a total of twelve elective course credits.
- 5 If pursuing the Control Systems emphasis with the Thesis or Capstone degree track, then 3 credits of elective are required to meet degree requirements.

Any new elective courses will apply for all catalog years unless otherwise stated.

TECHNICAL EMPHASIS AREAS

Students must choose one of the five technical emphasis areas: Engineering Design, Applications in Engineering Management, Control Systems, Structural/Geotechnical Engineering, or Aerospace Manufacturing Engineering. Please note the Aerospace Manufacturing Engineering emphasis requires students to complete the Certificate in Aerospace Manufacturing Engineering through the University of California - Los Angeles Extension.

The specific requirements for each emphasis are listed below.

ENGINEERING DESIGN

Course	Title	Credits
Select 12 credits of the following (at least two courses at 7000-level):		12
MECHENG 6560	Computational Fluid Dynamics	
MECHENG 6750	Computational Methods in Engineering	
MECHENG 6820	Advanced Manufacturing Processes	
INDSTENG 7030	Simulation Modeling of Engineering Systems	
INDSTENG 7070	Optimization with Engineering Applications	
MECHENG 7510	Design of Experiments	
MECHENG 7520	Design for Manufacturability	
MECHENG 7530	Design for Usability	
MECHENG 7540	Advanced Finite Element Method	
MECHENG 7550	Product Design and Development	
MECHENG 7560	Sustainability in Engineering Design	

Total Credits

12

APPLICATIONS IN ENGINEERING MANAGEMENT

Course	Title	Credits
Select 12 credits of the following:		12
INDSTENG 7810	Advanced Production and Operations Analysis	

INDSTENG 7820	Quality Engineering and Management
INDSTENG 7830	Advanced Cost and Value Analysis
INDSTENG 7840	Systems Engineering Management
INDSTENG 7850	Taguchi Method of Designing Experiments
INDSTENG 7860	Continuous Improvement With Lean Principles

Total Credits **12**

CONTROL SYSTEMS

Course	Title	Credits
Select 9 credits of the following:		
ELECTENG 7310	Control Systems Engineering I	9
ELECTENG 7320	Control Systems Engineering II	
ELECTENG 7340	Digital Control Systems	

Total Credits **9**

STRUCTURAL/GEOTECHNICAL ENGINEERING

Course	Title	Credits
ENGRG 5030	Linear Algebra ¹	12
Select at least 12 credits of the following: ^{2,3}		
CIVILENG 6150	Reinforced Concrete Structures (Str)	
CIVILENG 6230	Structural Steel Design with LRFD (Str)	
CIVILENG 7220	Dynamics of Structures (Str)	
CIVILENG 7260	Advanced Shallow Foundation Design with LRFD Applications (Geo)	
CIVILENG 7270	Advanced Deep Foundation Design with LRFD Applications (Geo)	
CIVILENG 7280	Geosynthetics Engineering (Geo)	
CIVILENG 7290	Earth Retaining Structures: Design, Analysis and LRFD (Geo)	
MECHENG 7540	Advanced Finite Element Method	
MECHENG 7560	Sustainability in Engineering Design	

Total Credits **12**

¹ Allowed to be taken as part of the degree core course requirements

² Must include at least two Structural Engineering (Str) courses and one Geotechnical Engineering (Geo) course.

³ At least two of the courses chosen must be at the 7000-level

AEROSPACE MANUFACTURING ENGINEERING EMPHASIS

THIS EMPHASIS WILL ALLOW A STUDENT TO COMPLETE A MASTER OF SCIENCE IN ENGINEERING WITH AN AEROSPACE MANUFACTURING ENGINEERING EMPHASIS FROM UW-PLATTEVILLE AND AN AEROSPACE MANUFACTURING ENGINEERING CERTIFICATE FROM THE UNIVERSITY OF CALIFORNIA – LOS ANGELES EXTENSION.

Upon completion of the Aerospace Manufacturing Engineering Certificate from UCLA, students may transfer 12 credits of MECHENG 7100 to fulfill the Aerospace Manufacturing Engineering emphasis.

CERTIFICATE IN ENGINEERING MANAGEMENT

A 12-credit Certificate in Engineering Management is available for people who want to expand their knowledge in engineering management related areas, but are not currently pursuing a master's degree. Credits earned for the certificate can later be applied toward the Master of Science in Engineering.

The Certificate in Engineering Management is comprised of four courses. Each course is worth three credits. These courses allow individuals to gain knowledge in areas that will assist them most in their professional situation.

UW-Platteville offers several graduate certificates. These certificates are distinct from the Master's degree, but credit earned for them might be applied toward the completion of the degree. To earn a certificate, students must complete all the required courses through the University of Wisconsin-Platteville, under the direction of the University of Wisconsin-Platteville faculty. Transferred courses or course substitutions are not allowed.

To obtain a graduate certificate, students must:

- Complete the certificate with a minimum GPA of 3.00
- Achieve a minimum grade of "C" in each course from the certificate program
- Request a certificate through their advisor within one year from completion of the final course of the certificate

To earn the certificate, students must complete the following requirements:

Course	Title	Credits
INDSTENG 7800	Engineering Management	3
Select three courses from the following:		9
ENGRG 6050	Applied Statistics	
INDSTENG 7810	Advanced Production and Operations Analysis	
INDSTENG 7820	Quality Engineering and Management	
INDSTENG 7830	Advanced Cost and Value Analysis	
INDSTENG 7840	Systems Engineering Management	
INDSTENG 7850	Taguchi Method of Designing Experiments	
INDSTENG 7860	Continuous Improvement With Lean Principles	
PROJMGT 7010	Project Management Foundations	
Total Credits		12

Students must complete all of the required courses for this certificate from the University of Wisconsin-Platteville to be eligible to receive the certificate. Transfer courses cannot be applied to the certificate program.

CERTIFICATE IN GEOTECHNICAL ENGINEERING

A certificate in Geotechnical Engineering is available for people who want to expand their knowledge in Geotechnical skills. This certificate allows individuals to gain knowledge in the area that will assist them most in their professional situation. Credits earned for the certificate can later be applied toward the Master of Science in Engineering degree. The certificate is comprised of 12 credits (four courses). Each course is worth three credits.

UW-Platteville offers several graduate certificates. These certificates are distinct from the Master's degree, but credit earned for them might be applied toward the completion of the degree. To earn a certificate, students must complete all the required courses through the University of Wisconsin-Platteville, under the direction of the University of Wisconsin-Platteville faculty. Transferred courses or course substitutions are not allowed.

To obtain a graduate certificate, students must:

- Complete the certificate with a minimum GPA of 3.00
- Achieve a minimum grade of "C" in each course from the certificate program
- Request a certificate through their advisor within one year from completion of the final course of the certificate

To earn the certificate, students must complete the following requirements:

Course	Title	Credits
CIVILENG 7260	Advanced Shallow Foundation Design with LRFD Applications	3
CIVILENG 7270	Advanced Deep Foundation Design with LRFD Applications	3
CIVILENG 7280	Geosynthetics Engineering	3
CIVILENG 7290	Earth Retaining Structures: Design, Analysis and LRFD	3
Total Credits		12

CERTIFICATE IN STRUCTURAL/GEOTECHNICAL ENGINEERING

A certificate in Structural/Geotechnical Engineering is available for people who want to expand their knowledge in the area that will assist them in their career. Credits earned for the certificate can later be applied toward the Master of Science in Engineering degree. Each course is worth three credits.

The certificate is earned by completing 12 credits consisting of two required and two additional courses from those listed below.

UW-Platteville offers several graduate certificates. These certificates are distinct from the Master's degree, but credit earned for them might be applied toward the completion of the degree. To earn a certificate, students must complete all the required courses through the University of Wisconsin-Platteville, under the direction of the University of Wisconsin-Platteville faculty. Transferred courses or course substitutions are not allowed.

To obtain a graduate certificate, students must:

- Complete the certificate with a minimum GPA of 3.00
- Achieve a minimum grade of "C" in each course from the certificate program
- Request a certificate through their advisor within one year from completion of the final course of the certificate

To earn the certificate, students must complete the following requirements:

Course	Title	Credits
CIVILENG 6230	Structural Steel Design with LRFD	3
CIVILENG 7220	Dynamics of Structures	3
Select two courses from the following:		6
CIVILENG 7260	Advanced Shallow Foundation Design with LRFD Applications	
CIVILENG 7270	Advanced Deep Foundation Design with LRFD Applications	
CIVILENG 7280	Geosynthetics Engineering	
CIVILENG 7290	Earth Retaining Structures: Design, Analysis and LRFD	
Total Credits		12

CERTIFICATE IN ENGINEERING DESIGN

The Engineering Design Certificate is comprised of 12 credits of design-related courses. Available courses span a wide range of disciplines, including industrial engineering, mechanical engineering, sustainability, and systems analysis.

The certificate is earned by completing 12 credits consisting of two required and two additional courses from those listed below.

UW-Platteville offers several graduate certificates. These certificates are distinct from the Master's degree, but credit earned for them might be applied toward the completion of the degree. To earn a certificate, students must complete all the required courses through the University of Wisconsin-Platteville, under the direction of the University of Wisconsin-Platteville faculty. Transferred courses or course substitutions are not allowed.

To obtain a graduate certificate, students must:

- Complete the certificate with a minimum GPA of 3.00
- Achieve a minimum grade of "C" in each course from the certificate program
- Request a certificate through their advisor within one year from completion of the final course of the certificate

To earn the certificate, students must complete the following requirements:

Course	Title	Credits
MECHENG 7520	Design for Manufacturability	3
MECHENG 7550	Product Design and Development	3
Select two courses from the following:		6
ELECTENG 7310	Control Systems Engineering I	
MECHENG 7510	Design of Experiments	
MECHENG 7530	Design for Usability	
MECHENG 7540	Advanced Finite Element Method	
MECHENG 7560	Sustainability in Engineering Design	
INDSTENG 7840	Systems Engineering Management	
Total Credits		12