

# MASTER OF SCIENCE IN ENGINEERING

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**Master of Science in Engineering**

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## 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 30 credits of advanced course work. No thesis is required. All course work is delivered online.

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, or structural/geotechnical engineering.

## ADMISSION REQUIREMENTS FOR MASTER OF SCIENCE IN ENGINEERING

Those seeking admission to the Master of Science in Engineering program must have earned 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. If the bachelor's degree is in a field other than engineering, applicants may be asked to complete prerequisite courses. International degrees will be evaluated on an individual basis.

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 on a trial enrollment justified by the admitting department and approved by the director of the School of Graduate Studies.

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 Online Admission Policies and Procedures section of this catalog.

## SPECIAL STUDENTS

Students with a bachelor's degree who want to enroll in selected courses without being admitted to the program may enroll as special students. A special student may transfer up to 12 credits earned at the University of Wisconsin-Platteville into a degree program. Completing courses as a special student does not ensure that the student will be admitted to the program.

## CURRICULUM

The Master of Science in Engineering is earned upon the successful completion of degree requirements. A total of 30 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 [www.uwplatt.edu/distance-education](http://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.

Code	Title	Credits
<b>Section A: Core Courses</b>		12
Select one course from each of the following areas:		
Mathematics:		
ENGRG 5030	Linear Algebra	
ENGRG 6050	Applied Statistics	
Computer Applications:		
ENGRG 7030	Simulation Modeling of Engineering Systems	
ENGRG 7070	Optimization with Engineering Applications	
Technical Communications:		
ENGRG 5000	Engineering Communications	
Engineering Management:		
ENGRG 7830	Advanced Cost and Value Analysis	
<b>Section B: Technical Emphasis Course</b>		9-18
Select one of the Technical Emphasis areas below		
<b>Section C: Elective Courses</b>		9
Select 9 credits of the following: <sup>1</sup>		
ENGRG 7930	Special Topics in Engineering	
ENGRG 7980	Independent Study in Engineering	
PROJMGT 7010	Project Management Techniques I	
PROJMGT 7020	Project Management Techniques II	
ISCM 7100/BUSADMIN 6100	International Supply Chain Management	
Total Credits		30-39

<sup>1</sup> Students completing an emphasis in Engineering Design, Applications in Engineering Management, or Control Systems must select a total of nine elective credits. 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 and academic advisor or the program coordinator for more information.

## TECHNICAL EMPHASIS AREAS

Students must choose one of the four technical emphasis areas: Engineering Design, Applications in Engineering Management, Control Systems, or Structural/Geotechnical Engineering. The specific requirements for each emphasis are listed below.

### ENGINEERING DESIGN

Code	Title	Credits
Select 9 credits of the following:		
ENGRG 7030	Simulation Modeling of Engineering Systems	
ENGRG 7070	Optimization with Engineering Applications	
ENGRG 7510	Design of Experiments	
ENGRG 7520	Design for Manufacturability	
ENGRG 7540	Advanced Finite Element Method	
ENGRG 7550	Product Design and Development	

### APPLICATIONS IN ENGINEERING MANAGEMENT

Code	Title	Credits
Select 9 credits of the following:		
ENGRG 7810	Advanced Production and Operations Analysis	
ENGRG 7820	Quality Engineering and Management	
ENGRG 7830	Advanced Cost and Value Analysis	
ENGRG 7840	Systems Engineering Management	
ENGRG 7850	Taguchi Method of Designing Experiments	
ENGRG 7860	Continuous Improvement With Lean Principles	

**CONTROL SYSTEMS**

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

**STRUCTURAL/GEOTECHNICAL ENGINEERING**

The Structural/Geotechnical emphasis may be completed by selecting ENGRG 5030 to complete the mathematics requirement, then taking:

Code	Title	Credits
ENGRG 7540	Advanced Finite Element Method (or an equivalent course)	3
Select at least 15 credits of the following: <sup>1</sup>		15
ENGRG 6230	Structural Steel Design with LRFD (Str)	
ENGRG 7220	Dynamics of Structures (Str)	
ENGRG 7260	Advanced Shallow Foundation Design with LRFD Applications (Geo)	
ENGRG 7270	Advanced Deep Foundation Design with LRFD Applications (Geo)	
ENGRG 7280	Geosynthetics Engineering (Geo)	
ENGRG 7290	Earth Retaining Structures: Design, Analysis and LRFD (Geo)	

Total Credits 18

<sup>1</sup> Must include at least one Structural Engineering (Str) course and one Geotechnical Engineering (Geo) course. Nine credit hours must be from the Geotechnical (Geo) emphasis and must be completed in sequential order.

**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.

Required courses:

Code	Title	Credits
ENGRG 7800	Engineering Management	3
Select three courses from the following:		
ENGRG 6050	Applied Statistics	
ENGRG 7810	Advanced Production and Operations Analysis	
ENGRG 7820	Quality Engineering and Management	
ENGRG 7830	Advanced Cost and Value Analysis	
ENGRG 7840	Systems Engineering Management	
ENGRG 7850	Taguchi Method of Designing Experiments (Prereq: ENGRG 6050 Applied Statistics)	
ENGRG 7860	Continuous Improvement With Lean Principles	
PROJMGT 7010	Project Management Techniques I	3

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.

Required courses:

<b>Code</b>	<b>Title</b>	<b>Credits</b>
ENGRG 7260	Advanced Shallow Foundation Design with LRFD Applications	3
ENGRG 7270	Advanced Deep Foundation Design with LRFD Applications	3
ENGRG 7280	Geosynthetics Engineering	3
ENGRG 7290	Earth Retaining Structures: Design, Analysis and LRFD	3

## **CERTIFICATE IN STRUCTURAL/GEOTECHNICAL ENGINEERING**

A certificate in Structural/Geotechnical Engineering is available for people who want to expand their knowledge in the area which 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.

Required courses:

<b>Code</b>	<b>Title</b>	<b>Credits</b>
ENGRG 6230	Structural Steel Design with LRFD	3
ENGRG 7220	Dynamics of Structures	3

Select two courses from the following:

ENGRG 7260	Advanced Shallow Foundation Design with LRFD Applications
ENGRG 7270	Advanced Deep Foundation Design with LRFD Applications
ENGRG 7280	Geosynthetics Engineering
ENGRG 7290	Earth Retaining Structures: Design, Analysis and LRFD

## **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.

Required courses:

<b>Code</b>	<b>Title</b>	<b>Credits</b>
ENGRG 7520	Design for Manufacturability	3
ENGRG 7550	Product Design and Development	3

Select two courses from the following:

ENGRG 7310	Control Systems Engineering I
ENGRG 7510	Design of Experiments
ENGRG 7530	Design for Usability
ENGRG 7540	Advanced Finite Element Method
ENGRG 7560	Sustainability in Engineering Design and Manufacturing
ENGRG 7840	Systems Engineering Management