

# TRANSPORTATION AND INFRASTRUCTURE ENGINEERING, M.S.E.

The M.S. in Engineering (M.S.E.) program is an interdisciplinary engineering program designed to meet the specific needs of engineers employed in industry, government, and consulting, as well as those desiring a traditional research-based graduate degree. The program offers a broad core curriculum with opportunities for concentrated study in three majors: Engineering Management, Civil and Environmental Engineering, and Transportation and Infrastructure Engineering.

## Admission Requirements

Applicants should follow the admissions process described in this catalog or at the Graduate Admissions website: <https://www.marshall.edu/graduate/admissions/>. Each applicant must have an undergraduate engineering degree from either an accredited ABET curriculum or an internationally recognized program.

1. If applicants have an undergraduate 2.5 or higher GPA on a 4.0 scale and have already passed the PE exam in the major for which they are applying (official copy of certificate to be sent to the Marshall University Graduate Admissions Office), their applications will be accepted.
2. If applicants have an undergraduate GPA of 3.0 or higher on a 4.0 scale in an engineering major closely related to that for which they are applying, their applications will be evaluated on a case-by-case basis.
3. If applicants have an undergraduate GPA between a 2.5 and 3.0 on a 4.0 scale in an engineering major closely related to that for which they are applying, applicants must take the GRE exam or pass the FE exam, and have their official GRE scores or official FE certificate sent to the Marshall University Graduate Admissions office. The applications will be evaluated on a case-by-case basis.

At least one letter of recommendation is required for all applicants.

International applicants must provide proof of English proficiency with a minimum score of 6.5 on IELTS, a score of 80 on the TOEFL IBT (or 550 paper-based), or by holding an approved degree from an accepted, regionally accredited university within the United States. International applicants must meet all other admission criteria prior to being admitted to the program and registering for the first semester of courses.

A current non-degree or degree-seeking Marshall University student who holds an undergraduate engineering degree, may apply to be considered for admission to the M.S.E. degree program if s/he has at least a minimum cumulative graduate GPA of 3.30 in his or her first 9 credit hours of M.S.E. courses. For international students, the English requirements stated above must still be satisfied.

Eligibility to take the PE exam is based primarily on completion of an ABET-accredited undergraduate engineering degree in most states.

Completion of a M.S.E. graduate degree at an institution with an ABET-accredited undergraduate degree does not fulfill that requirement to take the PE exam.

## Transportation and Infrastructure Engineering

Each Transportation and Infrastructure Engineering major must have completed the Foundation Courses listed below (and their associated prerequisites), or their equivalents as approved by his or her advisor, before being fully admitted. Until this requirement is satisfied, the student can only receive Provisional admission to the program. All other admission requirements must still be satisfied.

### Foundation Courses

Code	Title	Credit Hours
CE 312	Structural Analysis	3
CE 342	Transportation Engineering	3
CE 413	Reinforced Concrete	3

## Program Requirements

Each degree candidate is required to complete at least 30 graduate credit hours, depending on the option chosen below (project, thesis, or coursework only), with a cumulative Grade Point Average of 3.0 for the courses included in the student's Plan of Study. At least one-half of the minimum required hours for the degree must be earned in classes numbered 600 or above.

Each degree-seeking student must file an approved Plan of Study, developed with a faculty advisor, before the student registers for the 12th credit hour. The Academic Regulations portion of the Graduate Catalog may be consulted for additional information.

A student may only earn the M.S.E. degree once. Therefore, students wishing to complete two of the three M.S.E. majors (*i.e.*, double major) must complete all requirements for both majors before the degree is awarded. A maximum of 12 credit hours may be counted toward both majors, as approved by the student's academic advisor in each major. An option must be selected for each major and the two options are permitted to be different. However, each major must have its own comprehensive assessment (*i.e.*, comprehensive project, thesis, or comprehensive examination). For example, a single thesis and defense cannot satisfy the requirements for both majors.

Students may choose to complete either the project option, the thesis option, or the coursework-only option after consultation with their academic advisors.

**Project Option.** The comprehensive project involves the application of coursework completed as part of the degree to a practical problem. Students will work with their advisors to identify an appropriate project and scope. Students must prepare a formal written report and deliver an oral presentation to a committee. Students register for a Comprehensive Project (3 hrs.) during the semester in which their project will be completed and presented, but preliminary work on the project may commence before that semester.

**Thesis Option.** The thesis option involves the completion of 6 hours of research (ENGR 682 Research) under the direction of an advisor on an approved project. Students must summarize their work in the form of

a formal, written document and successfully defend the thesis before a committee. Thesis work is typically conducted over two semesters.

**Coursework-Only Option.** Students complete 30 hours of coursework and then complete a comprehensive examination within the last two semesters of graduation to fulfill the requirements of their degree program. Examinations will be administered no more than once per semester for any student. If the student does not pass the exam within three attempts, the student will be dismissed from the program.

## Transportation and Infrastructure Engineering

Students pursuing the Project Option or the Thesis Option must choose either Transportation Engineering or Structural Engineering as their primary focus. The other discipline will be the student's secondary focus. Three courses must be completed in the primary focus and two courses in the secondary focus for the Project and Thesis options. The Coursework-Only Option requires three courses in both disciplines.

### Plan of Study Coursework-Only Option

Code	Title	Credit Hours
Select one of the following:		3
ENGR 610	Applied Statistics	
Other Advisor-approved MTH course		
EM 660	Project Management	3
Three Courses in Structural Engineering (p. 2)		9
Three Courses in Transportation Engineering (p. 2)		9
Two Elective Courses (p. 2)		6
Total Credit Hours		30

### Project Option

Code	Title	Credit Hours
Select one of the following:		3
ENGR 610	Applied Statistics	
Other Advisor-approved MTH course		
Three Courses in Primary Focus (Structural Engineering or Transportation Engineering) (p. 2)		9
Two Courses in Secondary Focus (Structural Engineering or Transportation Engineering) (p. 2)		6
Three Elective Courses (p. 2)		9
ENGR 699	Comprehensive Project	3
Total Credit Hours		30

### Thesis Option

Code	Title	Credit Hours
Select one of the following:		3
ENGR 610	Applied Statistics	
Other Advisor-approved MTH course		
Three Courses in Primary Focus (Structural Engineering or Transportation Engineering) (p. 2)		9

Two Courses in Secondary Focus (Structural Engineering or Transportation Engineering) (p. 2)		6
Two Elective Courses (p. 2)		6
ENGR 682	Research	6
Total Credit Hours		30

## Structural Engineering and Transportation Engineering

### Structural Engineering Courses

Code	Title	Credit Hours
CE 612	Advanced Steel Design	3
CE 614	Advanced Concrete Design	3
CE 616	Prestressed Concrete Design	3
CE 618	Bridge Engineering	3
ENGR 570	Finite Elements	3
ENGR 670	Advanced Stress Analysis	3

### Transportation Engineering Courses

Code	Title	Credit Hours
CE 534	Geometric Highway Design	3
CE 538	Pavement Design	3
CE 634	Traffic Engineering	3
CE 635	Eval of Transportation Systems	3
CE 636	Transportation Planning	3
CE 637	Highway Safety Engineering	3

### Approved Elective Courses for the Transportation and Infrastructure Engineering Major

- Any Transportation Engineering or Structural Engineering course not already taken.
- Other courses approved in advance by the student's advisor.