

# MASTER OF SCIENCE IN THE FIELD OF SYSTEMS ENGINEERING (STEM, ON-CAMPUS)

The systems engineering program provides a broad knowledge of the "systems approach" for designing and managing large-scale engineering systems throughout the life cycle, with faculty and students exploring case studies and methodologies from NASA, the U.S. Department of Defense, and U.S. corporations. Graduate students can pursue their degrees in one of two focus areas: operations research and management science or systems engineering and integration.

Students pursuing a master's degree acquire excellent skills at the cutting edge of systems engineering. They also benefit from GW's many contacts with industry and governmental leaders. Students may choose a thesis or non-thesis option for the degree. GW's graduate systems engineering programs are offered to the general public at GW's campus in Arlington, VA. They are also offered on-site at U.S. corporate offices and facilities.

This is a STEM designated program.

For additional on-campus program information, visit the on-campus program website (<https://www.emse.seas.gwu.edu/ms-systems-engineering/>).

For additional online program information, visit the online program website (<https://engineeringmasters.online.gwu.edu/online-programs/ms-in-systems-engineering/>).

## ADMISSIONS

**Please note: The admission requirements below are for the on-campus program. Admission requirements for the online program are available at the online programs website (<https://engineeringmasters.online.gwu.edu/admissions/>).**

Admission deadlines: Fall – January 15

Spring – September 1

Summer - March 1 (non-F1 visa seeking applicants)

Standardized test scores: The Graduate Record Examination (GRE) is required of all applicants. (Institution code 5246).

The Test of English as a Foreign Language (TOEFL), the academic International English Language Testing System (IELTS), or the PTE Academic is required of all applicants except those who hold a bachelor's, master's, or doctoral degree from a college or university in the United States or from an institution located in a country in which English is the official language, provided English was the language of instruction. Minimum scores:

- Academic IELTS: an overall band score of 7.0 with no individual score below 6.5; or

- TOEFL: 600 on paper-based or 100 on Internet-based; or

- PTE Academic: 68.

Recommendations: (2) recommendations required. If possible, one recommendation should be from your advisor at the institution from which you earned your highest degree.

Prior academic records: Transcripts are required from all colleges and universities attended, whether or not credit was earned, the program was completed, or the credit appears as transfer credit on another transcript. Unofficial transcripts from all colleges and universities attended must be uploaded to your online application. Official transcripts are required only of applicants who are offered admission.

If academic records are in a language other than English, a copy in the original language and an English language translation must be uploaded. Transcript evaluations should not be uploaded. Applicants who have earned a degree from an Indian university are required to submit individual semester marksheets.

Statement of purpose: In an essay of 250 to 500 words, state your purpose in undertaking graduate study at GW; describe your academic objectives, research interests, and career plans; and discuss your related qualifications, including collegiate, professional, and community activities, and any other substantial accomplishments not already mentioned.

Additional requirements: Bachelor's degree with a GPA of at least 3.0 on a 4.0 scale for the last 60 hours of coursework. A grade of B- or better in MATH 1232 or its equivalent is prerequisite to all graduate programs offered by the Department. The Department requires that the applicant have a suitable bachelor's degree in an area such as engineering, a physical science, or mathematics.

All applicants should choose an area of focus that most closely matches their interests and note this on the online application. All applicants must submit a resumé or CV.

International applicants only: Please review International Applicant Information (<https://graduate.admissions.gwu.edu/international-student-application-requirements>) (<https://graduate.admissions.gwu.edu/international-student-application-requirements/>) carefully for details on required documents, earlier deadlines for applicants requiring an I-20 or DS-2019 from GW.

For additional information about the admissions process visit the SEAS Admissions Frequently Asked Questions (<https://graduate.engineering.gwu.edu/admissions-frequently-asked-questions/>) page.

Contact for questions:

engineering@gwu.edu

202-994-1802 (phone)

202-994-1651 (fax)

Hours: 9:00 am to 5:00 pm, Monday through Friday

## REQUIREMENTS

### Curriculum requirements

Non-thesis option—36 credits in coursework. Three types of course requirements are included in the curriculum: common course requirements, focus course requirements, and approved electives. Common course requirements are taken by all students in the MS program in systems engineering. Focus course requirements are taken by all students within the area of focus. Elective courses require the approval of the student's academic advisor.

Thesis option—36 credits, including the thesis. To register in the thesis option, students must submit their advisor-approved plan of study and thesis area to the department chair. In addition to the course requirements, students take the thesis course sequence, EMSE 6998 and EMSE 6999, ideally in the final two semesters of the program. Thesis credits may be used in lieu of electives. Hence, the program of study requires a minimum of 36 credits. While registered in the thesis course sequence, students work with the faculty member under whom the thesis is to be written. Students may consult with their advisors, but they have primary responsibility for their own thesis. Students defend their theses orally before a committee of SEAS faculty members.

The following requirements must be fulfilled: 36 credits, including 12 credits in required core courses and completion of a single focus area, each consisting of 12 credits in required courses and 12 credits in elective courses.

Code	Title	Credits
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#### Required

EMSE 6801	Systems Engineering I	
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EMSE 6020	Decision Making with Uncertainty	
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EMSE 6820	Program and Project Management	
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EMSE 6099	Problems in Engineering Management and Systems Engineering	
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Code	Title	Credits
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#### Operations research and management science focus area

##### Required

EMSE 6710	Optimization Models and Algorithms	
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EMSE 6760	Discrete Systems Simulation	
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EMSE 6765	Data Analysis for Engineers and Scientists	
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EMSE 6850	Quantitative Models in Systems Engineering	
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##### Electives

Four courses (12 credits) selected in consultation with the focus area advisor.

Code	Title	Credits
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#### Systems engineering and modeling focus area

##### Required

EMSE 6410	Survey of Finance and Engineering Economics	
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EMSE 6740	Systems Thinking and Policy Modeling I	
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EMSE 6815	Requirements Engineering	
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EMSE 6850	Quantitative Models in Systems Engineering	
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##### Electives

Four courses (12 credits) selected in consultation with the focus area advisor.

## Graduation and Scholarship Requirements

Students are responsible for knowing the university's minimum GPA requirement for graduation and scholarships.

Please visit the Graduation and Scholarship Requirements ([https://bulletin.gwu.edu/engineering-applied-science/#graduation\\_requirements\\_ms](https://bulletin.gwu.edu/engineering-applied-science/#graduation_requirements_ms)) section on this site to read the requirements.

Students should contact the department for additional information and requirements.

## Program Restrictions

Normally, only 6000 level courses (or higher) may be counted toward the requirements for the graduate degree.