DOCTOR OF PHILOSOPHY IN THE FIELD OF ENGINEERING MANAGEMENT (STEM)

The online master of science in engineering management is designed to provide students with an interdisciplinary understanding of leadership skills. Specifically, the skills needed to become effective managers in technology-driven organizations and government entities. Throughout the program, students acquire knowledge of technical engineering principles and engineering contracts within a management context.

Program graduates are equipped with the skills to effectively lead diverse engineering teams, oversee complex projects, implement innovative strategies, and drive organizational success. They also are prepared to take the Project Management Professional Examination (offered by the Project Management Institute) to receive the PMP certification.

The online program's structure offers synchronous and asynchronous learning options, giving students the flexibility to study at their convenience and from any location.

This is a STEM designated program.

Visit the program website (https://www.emse.seas.gwu.edu/doctor-philosophy) for additional information.

ADMISSIONS

Admission deadlines:	Fall – January 15
	Spring – September 1
	Summer* – March 1 (non-F1 visa seeking applicants)
Standardized test scores:	The GRE General Test is optional for all applicants. For applicants who want to submit scores, they must be submitted officially from ETS using the institutional 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 required:	Three 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:	Please write a comprehensive essay of 400 to 600 words, indicating your primary and supporting fields of study, your specialized interests, and the general subject area of your planned dissertation or professional project.
Additional requirements:	Applicants whose highest earned degree is a master's degree should have a grade-point average of at least 3.5. Applicants without a master's degree must have a bachelor's degree with a GPA of at least 3.3.
	All applicants must submit a resumé or CV. Applicants to the on–campus program should identify one to three faculty members whose research interests most closely match their own and note this on the online application. All on-campus applicants must choose an area of focus that most closely matches their interests and note this on the online application.
International applicants only:	Please follow this link - https://graduate.admissions.gwu.edu/international-student-application-requirements - to review the International Applicant Information carefully for details on required documents, earlier deadlines for applicants requiring an I-20 or DS-2019 from GW.

* A limited number of doctoral applicants are accepted for the summer. Please contact the admissions office for details. International applicants who require a visa from GW are eligible to apply for admission in fall and spring only (not summer).

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

Credit Requirements

Credit requirements

Students with a master of science degree must take a minimum of 30 credits, including at least 18 credits in coursework and at least 12 credits in EMSE 8999 Dissertation Research. Only 3 credits in EMSE 8998 Advanced Reading and Research can be counted toward the 18 credits in coursework. In some cases, particularly when the student undertakes a doctoral program in a field other than that in which the earlier degree was earned, the program of study can exceed the minimum number of credits.

Students entering the program with degrees beyond a bachelor's degree but without a relevant master's degree can be required to take additional coursework beyond the required minimum of 18 credits.

Students entering the program with a bachelor's degree (direct admits) must take a minimum of 54 credits, including at least 24 credits in coursework, at least 12 credits in EMSE 8999 Dissertation Research, and an additional 18 credits in either coursework and/or dissertation research. Credits earned in EMSE 6998, EMSE 8998 Advanced Reading and Research, and EMSE 8999 Dissertation Research do not count toward the minimum required 24 credits in coursework.

Code	Title	Credits
Required courses		
EMSE 6765	Data Analysis for Engineers and Scientists	
EMSE 8000	Research Formulation in Engineering Management and Systems Engineering	
EMSE 8001	Research Methods for Engineering Management and Systems Engineering	
Electives		
At least 9 credits in courses selected in consultation with the academic advisor.		
Research		
EMSE 8999	Dissertation Research (taken for a total of 18 credits)	

Additional requirements

1. To advance to the research phase, at the completion of their coursework students must have achieved a minimum GPA of 3.4 with no grade below *B-*
2. Coursework must be finished within three years (five years for direct admits) of the start of the PhD program.
3. Within three years of the start of the program (five years for direct admits), students must attempt the doctoral qualifying examination; they have a maximum of two attempts to pass the exam.
4. Within five years of the start of the program (seven years for direct admits), students must complete their research proposal and successfully defend it before a committee of three members, at least two of which must be from the Department of Engineering Management and Systems Engineering (EMSE). Students have a maximum of two attempts to pass their research proposal defense.
5. Within seven years of the start of their PhD program (nine years for direct admits), students must complete their research dissertation and successfully defend it to a committee of five members, at least three of which must be from the EMSE Department and one must be from outside the department. Students have a maximum of two attempts to successfully pass their dissertation defense.

If a student fails to pass any one of the qualifying examination, research proposal defense, or dissertation defense within two attempts they will be barred from further doctoral study.

Preliminary/Qualifying Examinations

The qualifying examination is the principal means of determining whether a student qualifies as a candidate for the doctoral degree and progresses to the second stage of the program. Its purpose is to ascertain whether the student's background and intellectual development are adequate to support doctoral research in the central field. The qualifying exam is in two parts: Part I is a two-part written exam and Part II is an oral and written focus area exam. Part I is offered in January; Part II needs to be completed by the end of the spring semester. To take the exam, students must have completed the core courses and 18 credits (six courses) of their required coursework. Students also must submit a qualifying exam checklist to the doctoral coordinator.

Qualifying Examination Part I

Part I consists of two parts: a two-hour, in-class exam covering EMSE 6765 and an eight-hour take-home exam covering EMSE 8000 and EMSE 8001. Both parts of Part I are offered during the last week in January. The EMSE 6765-based exam is also offered during the last week in September for students who failed only that part in January. Students should apply to take Part I of the qualifying exam before the end of the preceding semester.

Qualifying Examination Part II

Part II is a written and oral focus area exam. Students must take this exam at the end of the spring semester following the successful completion of Part I,i.e., students nominally complete Part I in January and take Part II in the third week of May. Students should register for EMSE 8999 for the semester in which they are taking the examination.

Students have three options for the basis for their oral defense:

1. A conference or journal paper, on which they are the lead author. If it is a conference paper, the full paper must have been peer-reviewed.
2. A seminal journal paper in their focus area. Their advisor and examining committee must approve the paper.
3. A ten-page literature review on a topic in their focus area. They have two weeks from the date they receive the literature review topic to complete their review.

In all cases, students are required to defend the work in front of a committee. The committee must consist of three faculty members, at least two of which are full-time in the Department of Engineering Management and Systems Engineering. Oral exams are approximately one hour long.

At the discretion of the committee, a student who fails any part of the qualifying examination can be given a second opportunity to attempt qualification for candidacy. Usually, only the failed portion of the examination must be retaken. Students who fail to qualify for candidacy in a doctoral program of the School of Engineering and Applied Science (SEAS) are considered to have failed on a school-wide basis and will not be admitted to further doctoral study within the School of Engineering and Applied Science.

After successful completion of the qualifying exam, the candidate's advisor will present the candidate's academic record and request the formation of a research committee. The EMSE Department votes on admission to candidacy and the formation of the research committee. The research committee must be formed before the proposal defense (see below) and must consist of the student's advisor and two additional EMSE faculty members, at least one of which must be full-time. Once the student is admitted to candidacy for the degree, they begin specialized study and research under the supervision of their research committee. At this point, the research committee remains fixed unless a change is formally requested and approved by the department chair and advisor.

Publication Requirements

Students have 18 months from completion of Part II of the qualifying exam to be accepted into a preapproved conference for presentation on a topic relevant to their research. This presentation must be co-authored by their advisor. Failure to do so will result in termination of their candidacy in the doctoral program.

Dissertation

Proposal Defense

After acceptance to a conference, students are required to present a written dissertation proposal to their research committee and to successfully defend the proposal in an oral defense. This proposal should consist of, at a minimum, an introductory chapter, a review of the literature chapter, a methodology chapter, and a chapter on potential results. The request for proposal defense form must be filed and approved two weeks prior to the defense. The Form 5 Doctor of Science Dissertation form is present at the proposal defense and, after a successful defense, is signed by all committee members. After the defense, the advisor, in collaboration with the student, submits in writing a copy (signed by the advisor and the student) of all suggestions, clarifications, and corrections to the proposal along with the signed Form 5 to the doctoral coordinator within four weeks of the defense. Failure to do so voids the defense and the student must defend the proposal again. The doctoral coordinator forwards the Form 5 to the department chair for signature. Students have a maximum of two attempts and a maximum time limit of two years past the semester in which they pass their qualifying exams to successfully defend their proposal. Failure to do so will result in termination of their candidacy in the doctoral program.

Final Examination/Doctoral Defense

Once the dissertation has been completed and accepted by the faculty advisor and research committee, students can file a Request for Final Examination form with the doctoral coordinator. This form must be filed and approved by the department chair at least two weeks prior to the final examination date. Approval is granted only when all required materials have been presented to the doctoral coordinator. The required materials include a fully completed Request for Final Examination Form, a copy of the journal article with reviews, resumes of outside evaluators, and electronic and written copies of the dissertation. The final examination is oral and open to the public. The candidate must demonstrate mastery of the special field of study and of the materials and techniques used in the research. The committee of examiners can include qualified experts brought to the University specifically to participate in the examination. The director of research usually serves as the candidate's advocate. Students should consult department regulations concerning the formation of the committee. The committee votes on the quality and originality of the candidate's contribution to knowledge as well as their mastery of the scholarship and research techniques of the field. Upon a majority vote for the student to pass, the committee recommends the candidate for the degree of doctor of philosophy. The vote to pass can be provisional, based on committee recommendations for changes to the dissertation in terms of additional analysis, writing, or clarifications.

Seminar and Colloquium Requirements

As described in the publication requirements section above, students are required to present at a preapproved conference on a topic relevant to their research. In addition, students also are encouraged to present and participate in departmental research seminars.

Graduation and Scholarship Requirements

Students are responsible for knowing the University's minimum GPA requirement for graduation and scholarships. Consult the Graduation and Scholarship Requirements (https://bulletin.gwu.edu/engineering-applied-science/#graduation_requirments_phd) section in this Bulletin.

Students should contact the department for additional information and requirements.

Preliminary/Qualifying Exams

The Qualifying Examination is the principal means of determining whether a student qualifies as a candidate for the doctoral degree and progress to the second stage of the program. Its purpose is to ascertain that the student's background and intellectual development are adequate to support doctoral research in the central field. The DQE will be offered in January (both parts) and September (only data analysis). Before taking the examination, students must have completed the core courses and 27 credits (nine courses) of their required coursework and have the DegreeMap finalized. Students must also submit a Doctoral Qualifying Exam Checklist to the doctoral coordinator.

The Qualifying Examination consists of two parts: a two-part written examination and a focus area exam.

Written Exam (Part I)

This exam consists of a two-hour, in-class exam covering EMSE 6765 and an eight-hour, take-home exam covering EMSE 8000 and EMSE 8001. Both exams are offered during the last week in January. The EMSE 6765-based exam is also offered during the last week in January. Students should apply to take this exam before the end of the preceding semester.

Focus Area Exam (Part II)

The Focus Area Exam is both a written and oral exam. Students must take this exam by the end of the semester following the successful completion of DQE part I (i.e., student will nominally complete Part I in January, and must take Part II in the third week of May). Students should register for EMSE 8999 for the semester in which they are taking the exam.

Students have three options for the basis for their oral defense:

- A conference or journal paper, on which they are the lead author. If it is a conference paper, the full paper must have been peer-reviewed.
- A seminal journal paper in their focus area. Their advisor and examining committee must approve the paper.
- A 10-page literature review on a topic in their focus area. They have two weeks to complete the review.

In all cases, students are required to defend the work in front of a committee. The committee must consist of three faculty members, at least two of which are full-time in EMSE. Oral exams are approximately one hour long.

At the discretion of the committee, a student who fails any part of the qualifying examination may be given a second opportunity to attempt qualification for candidacy. Usually, only the failed portion of the examination must be retaken. Students who fail to qualify for candidacy in a doctoral program of the School are considered to have failed on a school-wide basis and will not be admitted to further doctoral study within the School.

After successful completion of the DQE, the candidate's advisor will present the academic record of the candidate and request the formation of a research committee. The Department votes on (provisional) admission to candidacy and the research committee. The research committee must be formed before the proposal defense (described below) and must consist of the student's advisor and two other faculty members, at least one of which must be full-time. Once the student is admitted to candidacy for the degree, he/she begins specialized study and research under the supervision of their research committee. At this point the research committee remains fixed unless a change is formally requested and approved by the department chair and advisor.

Publication Requirements

Students are given 18 months from completion of DQE Part II to be accepted into a pre-approved conference for presentation on a topic relevant to their research. This presentation must be co-authored by their adviser. Failure to do so will result in termination of their candidacy in the doctoral program.

Dissertation

- Proposal defense: After acceptance to a conference, students are required to present a written dissertation proposal to their research committee and to successfully defend the proposal in an oral defense. This proposal should consist of, at a minimum, an introductory chapter, a review of the literature chapter, a methodology chapter, and a chapter on potential results. The Request for Proposal Defense form must be filed and approved two weeks prior to the defense. The Form 5 Doctor of Science Dissertation form is present at the proposal defense and, after a successful defense, is signed by all committee members. After the defense, the advisor in collaboration with the student submits, in writing, a copy (signed by student and adviser) of all suggestions, clarifications, and corrections to the proposal along with the signed Form 5 to the doctoral coordinator within four weeks of the defense. Failure to do so will void the defense. The doctoral coordinator forwards the Form 5 to the department chair for signature. Students are given a maximum of two attempts and a maximum time limit of two years past the semester in which they pass their DQEs to successfully defend their proposal. Failure to do so will result in termination of their candidacy in the doctoral program.
- Final examination/doctoral defense: Once the dissertation has been completed and accepted by the faculty advisor and research committee, students may file a Request for Final Examination form with the Doctoral Coordinator. This form must be filed and approved by the department chair at least two weeks prior to the final examination date. Approval is granted only when all required materials have been presented to the doctoral coordinator. The required materials include a completely filed Request for Final Examination Form, a copy of the journal article with reviews, resumes of outside evaluators and electronic and written copies of the dissertation. The final examination is oral and open to the public. The candidate must demonstrate mastery of the special field of study and of the materials and techniques used in the research. The committee of examiners may include qualified experts brought to the University especially to participate in the examination. The

director of research usually serves as advocate for the candidate. Students should consult department regulations concerning the formation of the committee. The committee votes on the quality and originality of the candidate's contribution to knowledge as well as their mastery of the scholarship and research techniques of the field. Upon a majority vote for pass, the committee recommends the candidate for the degree of Doctor of Philosophy. The vote to pass may be provisional based on committee recommendations for changes to the dissertation in terms of additional analysis, writing or clarifications.

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Students should contact the department for additional information and requirements.