

INDUSTRIAL ENGINEERING

Degree Requirements

Master of Engineering (M.Eng.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-700 Professional Degree Policies (<https://gradschool.psu.edu/graduate-education-policies/>).

The primary focus of the M.Eng. degree is not current students, but the thousands of IE alumni who are working as professional engineers and cannot easily take leave from their careers to return physically to the University Park campus for on-site courses and degrees. This degree provides an opportunity for these professionals to seek further education in the form of a professional graduate degree.

The requirements for the online M.Eng. degree program include:

1. Minimum of 30 course credits at the 400, 500, or 800 level, of which 21 course credits must be earned at Penn State (i.e. only 9 credits can be transferred from other institutions).
2. All students must successfully complete three credits of IE 894 Capstone Design.
3. At least 18 credits in 500- or 800- level courses, with at least 6 at 500 level (including IE 894).
4. At least 15 credits in 500- level or 800-level IE courses (including IE 894).
5. At least 21 credits of IE courses (including IE 894).
6. The culminating experience for this professional degree will be satisfied with IE 894, which includes a written report summarizing the analyses and designs used to solve a problem in their workplace submitted to the course instructor.

Continuous registration is required for all graduate students until the paper, thesis, or dissertation is approved.

Master of Science (M.S.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (<https://gradschool.psu.edu/graduate-education-policies/>)

The M.S. degree program is intended for students to gain advanced knowledge for research, analysis, and design in industrial engineering. The M.S. degree is offered with thesis or research paper tracks, both requiring 32 credits. For both tracks, a core curriculum is required that is composed of IE 505 and IE 511, which all the students must satisfy.

The M.S. degree with thesis track requires 24 credits of course work and two credits of IE 590. Out of the 24 credits of course work, at least 15 must be IE courses, and at least 12 must be at the 500 level. Of the 12 credits at the 500 level, at least nine must be IE courses. A thesis is required, for which six credits of IE 600 or IE 610 must be taken. The thesis must demonstrate comprehensive and in-depth knowledge of a topic in industrial engineering, and it should be suitable for submission for publication in a refereed journal as approved by the committee. The thesis must be accepted by the advisers and/ or committee members, the head of the graduate program, and the Graduate School.

The M.S. degree with non-thesis track requires 27 credits of course work, two credits of IE 590. Out of the 27 credits of course work, at least 18 must be IE courses, and at least 18 must be at the 500 level. Of the 18 credits at the 500 level, at least fifteen must be IE courses. A scholarly

paper is required for the M.S. degree with non-thesis track for which three credits of IE 596 must be taken. The paper should demonstrate the ability of the student to integrate and apply concepts and techniques learnt in the courses to solve an engineering problem.

The students seeking the Master of Science degree in Industrial Engineering with non-thesis track are expected to start their degree in the Fall semester of every year and complete their degree including all the required course work and three credits of research resulting in a paper and graduate by the end of summer following the second semester. A research adviser will be assigned to students in their first semester. Students who need more time to complete the final paper will be allowed to complete the paper, and have it reviewed and approved after the third semester has ended. Students are not required to remain in residence while they complete the final paper. However, extensions granted to students in this program must comply with the Graduate Council policy on deferred grades (<http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-400/gcac-401-grading-system/>). Non-thesis track students are typically not eligible for assistantships and therefore their plan of study is as follows:

- Fall semester: Twelve credits of course work, one credit of colloquium and one credit of research (IE 596).
- Spring semester: Twelve credits of course work, one credit of colloquium and one credit of research (IE 596).
- Summer semester: Three credits of course work and one credit of research (IE 596).

Continuous registration is required for all graduate students until the paper, thesis, or dissertation is approved.

An M.S. dual-title degree program in Industrial Engineering and Operations Research is also offered.

DOCTOR of Philosophy (Ph.D.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (<https://gradschool.psu.edu/graduate-education-policies/>)

The Ph.D. program emphasizes scholarly research, and prepares students for research and development careers in industry, government, and academe. Official entrance into the Ph.D. program occurs upon successful completion of a written qualifying examination. The Ph.D. is awarded upon completion of a program of advanced study that includes a minimum period of residence, passing the English competence and comprehensive examinations, completing a satisfactory dissertation, and passing the final oral examination. To earn the Ph.D. degree, doctoral candidates must write a dissertation that is accepted by the Ph.D. committee, the head of the graduate program, and the Graduate School. The degree requirements consist of 45 credits of course work and four IE 590 credits. Of the 45 credits of required course work, 36 must be prefixed IE, and at least 30 must be at the 500 level. Nine credits must be from outside the Department and must include a six-credit sequence, with at least three credits at the 500 level. A Ph.D. dual-title degree program in Industrial Engineering and Operations Research is also available.

Continuous registration is required for all graduate students until the paper, thesis, or dissertation is approved.