

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 Master of Engineering in Industrial Engineering is offered online through Penn State World Campus in partnership with the Penn State College of Engineering.

Students must complete 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). In addition:

- All students must successfully complete three credits of IE 894: Capstone Design.
- At least 18 credits must be in 500-level or higher courses (including IE 894).
- At least 15 credits must be in 500-level or higher IE courses (including IE 894).
- At least 21 credits of the 30 credits must be IE courses (including IE 894).

The Master of Engineering in Industrial Engineering has limited formal course requirements; the program tailored specifically to suit the student's needs and educational goals. The list of IE 400- and 500-level courses can be found here: Courses - Industrial Engineering Master's Degree Online - Penn State World Campus (psu.edu) (<https://www.worldcampus.psu.edu/degrees-and-certificates/penn-state-online-industrial-engineering-masters-degree/courses>).

Students may select from a list of elective courses maintained by the program. This list may change over time in response to market demand.

Students may also use the graduate certificate courses in Additive Manufacturing and Design, Supply Chain Management, and Engineering Leadership and Innovation Management.

For a full overview of the M ENG program, please visit: Industrial Engineering Master's Degree (M.Eng.) Online - Penn State World Campus (psu.edu) (<https://www.worldcampus.psu.edu/degrees-and-certificates/penn-state-online-industrial-engineering-masters-degree/overview>).

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/>)

MASTER OF SCIENCE (THESIS and NON-THESIS TRACKS)

All M.S. students must be continuously registered for at least one credit during fall and spring semesters until completion of all degree requirements, including approval of the paper or thesis if pursuing those tracks. This is a college and department requirement.

M.S. Coursework Requirements

A minimum of 32 credits, including two credits of IE Colloquium, are required to complete an M.S. degree in Industrial Engineering. A minimum GPA of 3.00 is required for graduation. M.S. students may select either the thesis or non-thesis degree track. All degree status changes, including degree-track changes, must be approved by the

student's research advisor. The course requirements for an M.S. degree (Non-Thesis Track and Thesis Track) in Industrial Engineering are shown here.

M.S.--Non-Thesis Track-27 Course Credits

- IE 505 Linear Programming (3 credits)
- IE 511 Experimental Design in Engineering (3 credits)
- 21 additional course credits with the following restrictions:
 - Minimum of 9 credits must be IE 500 level course credits
 - Minimum of 12 credits must be 500 level course credits
 - Minimum of 12 credits must be IE course credits * Research credits (IE596, 3 credits) or Capstone Credits (3 credits)
- IE 590 Colloquium (2 credits)

NOTE: OR 590 may be substituted for 1 credit of IE 590

Total Credits for M.S. –Non-Thesis Track: 32

M.S.--Thesis Track-24 Course Credits

- IE 505 Linear Programming (3 credits)
- IE 511 Experimental Design in Engineering (3 credits)
- 18 additional course credits with the following restrictions:
 - Minimum of 3 credits must be IE 500 level course credits
 - Minimum of 6 credits must be 500 level course credits
 - Minimum of 9 credits must be IE course credits
- Research Credits (6 credits)
 - IE 600
- IE 590 Colloquium (2 credits)

NOTE: OR 590 may be substituted for 1 credit of IE 590

Total Credits for M.S.—Thesis Track: 32

Notes:

- Students seeking a dual-title degree title in IE and Operations Research may substitute one credit of OR 590 for one of the two required credits of IE 590.
- Only 400 level courses approved by the IE faculty can be taken for graduate credit.
- Certain courses taught by other departments duplicate course topics in IE courses. Students may not count the IE course and the corresponding duplicate course from another department toward their degree requirements.
- IE 596 (Individual Studies) credits cannot be applied toward course requirements.
- Students enrolled in the dual-title IE-OR degree must complete more specific coursework requirements as part of the minimum course credits for their dual-title M.S.

M.S. Non-Thesis Track - Capstone Requirements

For the Capstone Course, all degree requirements must be met prior to taking this course or be met concurrently in the same semester this course is taken.

M.S. Non-Thesis Track - Paper Requirements

The M.S. paper must demonstrate the capability of the student to integrate and apply concepts and techniques learned in the courses to solve an engineering problem. The scope of the culminating project

resulting in this paper must be specified by the student's research adviser who is selected by the student during the first semester of coursework.

The electronic copy of the approved culminating research paper must be submitted to the IE Department by the paper deadline which is typically near the midpoint of the final semester. This scholarly paper will be made publicly available through the IE Department. At least one faculty reader other than the student's adviser must read and approve the paper, in addition to final approval by the IE Graduate Program Coordinator. The adviser must be a member of the graduate faculty from the IE Department; however, the reader can be a faculty member from within the department or graduate faculty member outside the department. Students should consult the student handbook regarding additional IE-OR Dual Title paper requirements.

M.S. Thesis Track – Thesis Requirements

The content of the M.S. thesis should be of quality sufficient for publication in a refereed journal. The thesis should follow the format specified by the Graduate School. The adviser must be a member of the IE Department Graduate Faculty; however, the reader can be a Graduate Faculty Member from either within the IE Department or outside the Department. The approval of the Department Head or the Graduate Program Coordinator is also required. Additional IE-OR Dual Title thesis requirements are described at <https://www.or.psu.edu/masters-degree/>. Students in the M.S. Thesis Track are exempt from taking the Capstone Course.

The review and approval of M.S. thesis is initiated by the student on the Graduate School Thesis Submission website <https://gradschool.psu.edu/completing-your-degree/thesis-and-dissertation-information/>. Final submission and departmental approval deadlines for M.S. thesis must be completed as per current deadlines well before the end of the semester.

Failure to meet these deadlines will delay the official awarding of your degree.

Obtaining an Operations Research Dual Degree During Your M.S.

Students enrolled in Operations Research Dual Title degree program as part of their M.S. program should refer to the Operations Research Dual Title degree requirements for additional coursework and research paper/thesis approval requirements, <http://www.or.psu.edu/>.

Typical M.S. Time Sequence

Most M.S. non-thesis track and M.S. thesis track students complete their degree requirements in 3 or 4 semesters. However, it is possible to complete M.S. degree requirements in one calendar year as follows:

Non-Thesis

- 1st Semester: 12 credits coursework, 1 credit IE 590
- 2nd Semester: 12 credits coursework, 1 credit IE 590
- Summer: 3 credits coursework, 3 credits of capstone or IE 596

Thesis

- 1st Semester: 12 credits coursework, 1 credit IE 590, 1 credit IE 600 (Research)
- 2nd Semester: 12 credits coursework, 1 credit IE 590, 1 credit IE 600 (Research)
- Summer: 4 credits IE 600 (Research)

Note: Students on assistantship may take longer to complete.

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.