

OPERATIONS MANAGEMENT PHD

Degree Requirements

The following requirements are in addition to, or further elaborate upon, those requirements outlined in The Graduate School Policy Guide (<https://catalogs.northwestern.edu/tgs/academic-policies-procedures/>).

Requirements can also be found in the *Program Guidelines* for Operations Management PhD students issued by the Kellogg School of Management.

Master's

While the goal of our doctoral program is the awarding of a PhD degree, a Master of Science (MS) degree may be awarded to currently enrolled, qualified doctoral students. Students who are continuing for a PhD degree, or students who withdraw from the PhD program, may be considered for a MS degree if they are in good academic standing and they have completed a minimum of three quarters of coursework with a cumulative 3.0 GPA.

PhD

Total Units Required: 21

Students in the PhD program are required to take 21 courses. In year 1, a minimum of 4 courses in fall, winter, and spring quarters or 12 courses total. In year two, a minimum of 3 courses a quarter or 9 courses total. Registration for independent research study with a professor can count towards the coursework requirement. Required courses for the degree are listed below:

Course	Title
ECON 410-1	Microeconomics
ECON 410-3	Microeconomics
ECON 480-2	Econometrics
ECON 480-3	Econometrics
IEMS 460-1	Stochastic Processes I
MECS 560-1	Static Optimization in Economics (or equivalent in IEMS)
MECS 560-2	Dynamic Optimization in Economics (or equivalent in IEMS)
OPNS 516-0	Stochastic Foundations
OPNS 521-0	Foundations of Operations Management
OPNS 525-0	Emerging Areas in Operations Managements

First-year Operations PhD students are required to take a Math course. MATH 300 Introduction to proof writing or MATH 320, MATH 321-1 or MATH 410-1 Rigorous proof Writing and Real analysis. Note: MATH 300 is a prerequisite for MATH 320, as well as linear algebra and multivariable calculus. Students need a permission number from MATH 321-1 to enroll. It is not advised to register for MATH 321-1 unless students have satisfied these prerequisites (perhaps at their prior institution).

Operations PhD students are also required to take one MBA course at the Kellogg School of Management: either **OPNS 430-0**, "Operations Management (<https://www4.kellogg.northwestern.edu/coursecatalogschedule/CourseDetail.aspx?CourseID=205806>)," or **OPNS 440-0**, "Designing and Management Business Processes

(<https://www4.kellogg.northwestern.edu/coursecatalogschedule/CourseDetail.aspx?CourseID=205810>).")

To fulfill the 21-course requirement for the PhD degree, students must also take approved electives, which may include independent study (OPNS 499-0), in addition to the required courses listed above.

Other PhD Degree Requirements

- **Examinations:** Students take an oral exam in June of their first year. The exam is based on the student's review and presentation of one of a selection of classic, important published operations papers.
- **Research/Projects:** Oral presentation of a research paper to a faculty committee that demonstrates competency in operations research during the first week of the fall quarter of the third year. Upon successfully passing this summer paper and maintaining a 3.0 GPA in the coursework, students are admitted to candidacy.
- **PhD Dissertation:** Original and significant research. Topic and advisor or advisors should be selected in the third year; presentation of preliminary results (prospectus) to the faculty committee no later than December 15 of the fourth year.
- **Final Evaluations:** Oral final examination on dissertation and submission of an approved dissertation.