

Industrial and Manufacturing Engineering

Department Information

- **Department Chair:**
David Grewell, Ph.D.
- **Email:**
david.grewell@ndsu.edu
- **Graduate Coordinator:**
Yiwen Xu, Ph.D.
- **Email:**
yiwen.xu@ndsu.edu
- **Department Location:**
202 Civil & Industrial Engineering Building
- **Department Phone:**
(701) 231-9818
- **Department Web Site:**
www.ndsu.edu/ime/ (<http://www.ndsu.edu/ime/>)
- **Application Deadline:**
International applications due March 1 for fall; August 15 for spring and summer. Domestic applications due one month prior to start of semester. For assistantship consideration, fall applications due March 1; limited spring openings.
- **Credential Offered:**
Ph.D., M.S.
- **Test Requirement:**
GRE - General
- **English Proficiency Requirements:**
TOEFL ibt 79; IELTS 6.5; Duolingo 105

Program Description

The Department of Industrial and Manufacturing Engineering offers graduate studies at both the Master of Science and Doctor of Philosophy levels. A Master of Science degree may be earned in either Industrial Engineering and Management (IE&M) or Manufacturing Engineering (MfgE). The Master of Science degree can be completed through a thesis option. The IE&M master's programs are designed to equip students with the ability to analyze, design, and manage industrial and business systems as well as to enable students to develop scholarly abilities to further pursue a Ph.D. degree in industrial and manufacturing engineering. Students have an opportunity to conduct research in the development of theoretical concepts and industrial systems.

For more information about our department and programs, please visit our department website at www.ndsu.edu/ime/.

Admission Requirements

Graduate study in the Department of Industrial and Manufacturing Engineering is open to all qualified baccalaureate graduates from universities and colleges of recognized standing. In addition to the Graduate School requirements, applicants must submit a GRE score.

- M.S. - 310 (Verbal + Quantitative) and 160 Quantitative minimum and Analytical Writing score of 3.5 or better
- Ph.D. - 310 or better (Verbal + Quantitative) and 160 Quantitative minimum and Analytical Writing score of 3.5 or better

Financial Assistance

There are a limited number of teaching assistantships available in Industrial and Manufacturing Engineering, which are normally assigned as support for classes with large enrollments and/or heavy laboratory content. Research assistantships are offered when student's capabilities and background experience match the needs of the project. While teaching assistantships are funded through the University, research assistantships are generally funded through externally-funded grants and contracts. In both cases, assistantships are considered as employment, and the graduate student should view these appointments as a job. The student's thesis or dissertation may or may not be in the area of their job duties for the assistantship.

Full assistantships are for half-time employment (20 hours per week). Tuition for all graduate credits, resident or nonresident, are waived for individuals officially appointed as research or teaching assistants. Student fees are not waived. When a student is offered an appointment as a

Graduate Research Assistant, the faculty and the department will carry the expectation that the student has made a full commitment to fulfill both the degree requirements and the job responsibilities.

Degree Requirements

The Master of Science degree in Industrial Engineering and Management or Manufacturing Engineering requires 30 credits of graduate-level study.

- A minimum of 15 credits from *didactic IME* courses (numbered IME 601-689 and IME 700-789) are required.
- In addition, a minimum of 6 credits of *other courses* are required for funded student (no matter GTA or GRA). This part of the course credits may come from approved graduate level courses of other departments. If a student is funded by himself/herself, then the minimum requirement of other courses is 8 credits.
- A minimum of 3 credits (i.e., from three semesters) from IME *graduate seminar* (IME 790) are required for a funded student (no matter GTA or GRA). If a student is funded by himself/herself, then the minimum requirement of the graduate seminar is 1 credit.
- 6 credits of thesis (IME 798) are required towards the M.S. degree.
- All graduate students are required to submit two articles to a refereed journal or refereed conference based on their thesis research.

The Doctor of Philosophy degree requires 60 credits beyond the M.S. requirement (90 credits total).

All students admitted into the IME Ph.D. Program must pass the qualifying exam (QE). The exam will include written and oral portions. *Four topics* will be selected by the major professor with consultation with the student. In general, the exam will measure the student's basic knowledge of the fundamentals in core topics related to IME. The written and oral exams will be executed with one day of each other, typically one week before the start of fall semester. Ph.D. students are recommended taking the QE at the end of their first year.

For students who are enrolled with a M.S. degree, the course credit requirements *beyond the M.S. degree* are:

- A minimum of 15 credits from *didactic IME courses* (IME 601-689 and 700-789), with at least 9 credits from 700-level IME courses. If courses are not offered in a timeline that meet the students requirements, it is possible for waiver/substitution requests.
- A minimum of 12 credits of *other courses* are required. This part of the course credits may come from approved graduate level courses of other departments.
- A minimum 3 credits of *Graduate Seminar* (IME 790).
- A minimum of 30 credits of *dissertation* (IME 899).

For students who are enrolled with a bachelor's degree, the course credit requirements are:

- A minimum of 30 credits from *didactic IME courses* (IME 601-689 and 700-789), with at least 9 credits from 700-level IME courses. If courses are not offered in a timeline that meet the students requirements, it is possible for waiver/substitution requests.
- A minimum of 27 credits of *other courses* are required. This part of the course credits may come from approved graduate level courses of other departments.
- Among these 57 course credits, at least 30 of them must be 700-level course. For example, if you take 9 credits of 700-level IME courses, then you need to take at least 21 credits of 700-level courses of other departments.
- A minimum 3 credits of Graduate Seminar (IME 790).
- A minimum of 30 credits of dissertation (IME 899).

For either the M.S. or Ph.D., all courses taken outside of the IME Department must be approved in advance by the student's academic adviser. The total courses of study must be approved by the student's academic adviser, POS (plan of study) committee, and department chair. Students completing graduate degrees within the IME Department are expected to exhibit demonstrable expertise in the core competencies of either industrial engineering or manufacturing engineering. Students whose undergraduate major is in another field may be required to include some or all of the core competencies in their graduate coursework. For further information in this regard, please consult the IME department.

Each new student must have an academic advisor and select their POS committee by the end of their 1st semester of study (see IME grad handbook for requirements). This committee will be chaired by the faculty adviser and will provide direction, advice and examination of the student's work and achievement. All students must consult with their major advisor and submit a plan of study (POS) by the end of the second semester of study. Once approved, the POS will provide direction for the remainder of the student's degree work.

Faculty List

Canan Bilen-Green, Ph.D.

University of Wyoming, 1998

Research Interests: Statistical Process Control, Quality Management

Kambiz Farahmand, Ph.D., P.E.

University of Texas, 1992

Research Interests: Ergonomics Design, Layout Planning and Management

David Grewell, Ph.D.

Ohio State University, 2005

Research Interests: Bio-renewable Biodegradable polymers, High Power Ultrasonics, Micro-Fabrication and Polymer and Metal Welding

Trung (Tim) Q. Le, Ph.D.

Oklahoma State University, 2013

Research Interests: Data Analytics & Reliability Engineering, Medical Instrumentation

Lokesh Narayanan, Ph.D.

North Carolina State University, 2019

Research Interests: Biomedical Design, Bio-Manufacturing and Automation

Yiwen Xu, Ph.D.

University of Arizona, 2015

Research Interests: Integer Programming, Network Models and Machine Learning

Nita Yodo, Ph.D.

Wichita State University, 2017

Research Interests: Modeling and Optimization of Complex Systems, Predictive Analysis for Failures, Data Driven Decision Making Under Uncertainties

Om Prakash Yadav, Ph.D.

Wayne State University, 2002

Research Interests: Reliability Engineering, Robust Design