

Manufacturing Engineering

Introduction

Master of Science Degree The graduate program in manufacturing engineering has been designed in response to regional needs for a graduate program to provide educational incentives for recruitment and retention of engineers. The program will accommodate the work requirements of these full-time professionals, being presented entirely by distance delivery means to the student's location. Workshops offered through UW-Stout's Northwest Wisconsin Manufacturing Outreach Center (NWMOC) are incorporated into the degree program.

Objectives of the program are that graduates will know how:

1. To apply mathematical models to the analysis of practical engineering problems.
2. To apply appropriate production operations management principles to the design and operation of manufacturing processes and systems.
3. To develop expertise in the areas of project management, automation and control, system design and integration, or other advanced manufacturing engineering topics.
4. To synthesize the knowledge gained in the first three objectives in solution of practical engineering projects.

Entrance Requirements

Admission requirements include a bachelor's degree in engineering, a minimum grade point average of 3.0, and, if English is a second language, a TOEFL score of 500 or higher. The GRE is not required. Applicants with undergraduate degrees in fields closely related to engineering and with appropriate engineering experience in manufacturing or with a grade point average below 3.0 may be admitted at the discretion of the program director.

Progress Toward Degree

Students will enroll in a sequence of courses that are offered via distance delivery and face-to-face instruction. Benchmarks include satisfactory completion of coursework with a grade of "B" or better, field research project approval and completion of a field research project.

Requirements

The program requires 30 hours of graduate credit, 15 of which must be graduate-only (700 level), with an overall grade point average of 3.0 or better. Twelve credits are included in the core curriculum, six credits are in the management component, and no less than six credits are to be taken from one of four of the following elective depth areas:

- ▶ Manufacturing Competitiveness
- ▶ Engineering Materials and Processes
- ▶ Mechanical Design
- ▶ Automation and Control

Core Curriculum

12 Credits

INMGT-765	Program Management	3
INMGT-700	Organizational Research Methods	3
MFGE-735	Problems in Manufacturing Engineering (<i>Plan B</i>)	3

Lean Manufacturing Seminar Series:

CTEM-701	Lean Seminar I: Principles of Lean Manufacturing5
CTEM-702	Lean Seminar II: Value Stream Mapping Manufacturing5
CTEM-703	Lean Seminar III: Principles of Cellular/Flow Manufacturing5
CTEM-704	Lean Seminar IV: The 5S System5
CTEM-705	Lean Seminar V: Quick Changeover/Setup Reduction5
CTEM-706	Lean Seminar VI: Total Productive Maintenance5
CTEM-707	Lean Seminar VII: VSM/Project Planning5
INMGT-640	Lean Enterprise	3

Note: Students may take either CTEM-701 through CTEM-706 (3 credits total) or INMGT-640.

Management

Select 6-9 credits from the following:

BUMGT-6XX	Supply Chain Management in Product Development	3
BUACT-6XX	Cost Analysis	3
INMGT-520	Quality Tools	3
INMGT-525	Quality Management	3
INMGT-600	Organization Leadership <i>or</i>	
INMGT-616	People Process Culture <i>or</i>	
INMGT-750	Organizational Development	3
INMGT-610	Six Sigma Quality Improvement Methods	3
INMGT-705	Enterprise Resource Planning	3
RC-581	Occupational Safety/Loss Control <i>or</i>	
RC-587	Human Factors Engineering	3

Depth Requirement

A student is allowed to study a particular area in depth. Coursework is subject to advisor approval. Students are required to take 9-12 credits from the course array following, with at least six credits in one of the depth areas:

Manufacturing Competitiveness

INMGT-625	Planned Experimentation for Quality Improvement	3
INMGT-745	Advanced Manufacturing Simulation <i>or</i>	
MFGE-640	Manufacturing System Design and Simulation	3
MFGE-665	Reliability Engineering	3
SUST-730	Sustainable Futures	3

Engineering Materials and Processes

MFGE-771	Emerging Manufacturing Materials	3
MFGE-7XX	Emerging Manufacturing Processes	3
MFGE-7XX	Polymer Engineering	3

Mechanical Design

MECH-729	Product Development and Design	3
CADD-7XX	Surface Modeling	3
MFGE-7XX	Finite Element Methods and Projects	3
MFGE-7XX	Advanced Mechanics of Materials	3

Automation and Control

MFGE-7XX	Integrated Systems and Automation	3
MFGE-7XX	Classical Control Theory with Applications	3
MFGE-7XX	Robot Theory with Applications	3

Note: Minimum credits at graduate (only) level: 1/2 total credits at 700-800 level.

Transfer Credit: With program director approval, and subject to Graduate School policies, up to 1/3 of the total credits may be transfer credits from an institution accredited to offer graduate degrees.