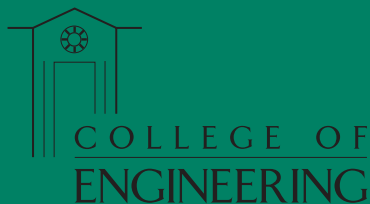


Five-Year Integrated Degree
Program in Manufacturing &
Engineering Management
(M&EM)



Bachelor of Science
from the College of
Engineering



Master of Science
from The Eli Broad
Graduate School
of Management



Dr. Shawnee Vickery
Graduate Program Director
Associate Professor of
Marketing and Supply
Chain Management



Dr. Farhang Pourboghra
Undergraduate Program Director
Associate Professor of
Mechanical Engineering

The Integrated Degree Program in Manufacturing and Engineering Management

Michigan State University's College of Engineering and the Eli Broad Graduate School of Management cooperatively educate students for manufacturing and engineering positions in the 21st century global marketplace through their integrated degree program: the Master of Science in Manufacturing and Engineering Management.

The innovative five-year integrated degree program offers a select group of students the opportunity to gain engineering expertise in their chosen undergraduate major (mechanical engineering, electrical engineering, chemical engineering and other ABET-accredited majors) and combine it with the graduate management training necessary for success in today's technologically sophisticated, environmentally conscious manufacturing arena.

This dynamic combination of degrees provides upward mobility to management and executive ranks and added job security in an era when even highly skilled professional jobs face the possibility of being outsourced.

Students learn in the classroom, in the laboratory and on the industrial job site how to design, develop, manufacture and market high-quality, economically competitive, environmentally friendly products. They learn total quality management skills, oral and written communication skills, and they grapple with the ethical questions necessary to advance a capitalistic society while sustaining the planet's natural habitat.

Program Mission

This master's program is designed to produce women and men who have an in-depth understanding of engineering and business principles as they apply to manufacturing. These individuals will work to ensure the nation's technological excellence in the global marketplace while safeguarding precious natural resources at home and abroad.

An external executive advisory board serves in an advisory capacity to the deans, department chairpersons and program directors whose responsibility it is to oversee the integrated Manufacturing and Engineering Management degree program. (Use this footnote at bottom of page: The External Executive Advisory Board also oversees the M&EM program's newly instituted sister program the Master of Science in Manufacturing and Innovation (MSMI) Degree Program for working engineers and operations managers (see MSMI brochure).)

The purpose of the external advisory board is to provide advice and counsel on all matters pertaining to the degree program including but not limited to: program educational objectives, program assessment and evaluation, program improvement, program requirements and program curriculum. The board's advice and counsel are essential and invaluable in ensuring the high quality of the M&EM program and its relevance to the employers that hire our students.

Profile of Graduates

The Integrated Degree Program in Manufacturing and Engineering Management is highly selective. Our graduates have an excellent record of placement with leading edge and innovative companies like International Paper, Ford, General Electric, General Motors and Lear Corp. In many cases, companies providing cooperative educational experiences (co-ops) for our students have ended up hiring them when they graduate. The first student to complete the integrated degree program graduated in 1999. Since then, over 50 students have graduated from the program.



Program Structure and Information



"While enrolled in the MS-M&EM program, I was guided to co-op and found employment with General Motors. I found that working in the industry paralleled what I was studying in the classroom. The combination of the engineering degree and the business degree gave me both the education and the confidence to enter the competitive automotive industry."

Steven Gornick
Manufacturing Engineer
General Motors
MS '99

Students in this program must complete an ABET-accredited undergraduate engineering degree at Michigan State University before entering the master's program. They are required to take certain prerequisite classes as part of their engineering coursework, and they must enter the masters program in the fall semester following completion of their undergraduate engineering degree.

Overall, during the first four years of the five-year program, students:

- Become rooted in engineering fundamentals - mathematics, physical and life sciences, and information technology during years one and two.
- Focus on a particular engineering major during the last two years, including the required nine-credit manufacturing engineering course sequence and nine credits in economics and accounting.
- Spend two semesters taking cooperative education, in which students work full-time in an industrial setting, improving hands-on learning.
- Complete 128 credit hours.

The final year of the five-year program is devoted to graduate business coursework.

- Topics such as design-for-manufacture, agile manufacturing, new communication and information networks, and the effects of automation on human and physical resources are an integral part of the program.
- Students learn to analyze manufacturing systems for overall technical performance such as through-put time, defect and/or scrap rates, and economic and environmental performance.
- Graduates are able to quantify trade-offs between competing technologies utilized in the manufacturing systems.
- An additional 30 credit hours are completed during this final year.

Master's Graduation Requirements

Students must successfully complete 30 credits of coursework to receive their Master of Science in Manufacturing and Engineering Management degree. The classes must be completed lock-step in a single year as indicated below.

Fall Semester (15 credits)

MSC 800 Supply Chain Management (3 credits) – Fundamentals of materials and logistics management. Quality, inventory management, logistics strategy, customer service, international procurement, management of technology.

MSC 803 Operations Management Strategy (3 credits) – Operations management issues including quality, technology, group technology, computer integrated manufacturing and just-in-time manufacturing.

MSC 805 Marketing Management (3 credits) – Strategic and decision-making aspects of marketing functions. Analysis, coordination, execution of marketing programs. Development of strategies and tactics.

MSC 842 Total Quality Management (3 credits) – Total quality management principles and practices, tools and techniques, implementation of continuous quality improvement programs, links to manufacturing and competitive strategies.

FI 801 Managerial Finance (3 credits) – Short-, intermediate- and long-term problems. Financial planning and control. Applications in domestic and international settings.

Spring Semester (15 credits)

MSC 843 Environmentally Conscious Manufacturing (3 credits) – Elements of the environmentally responsible enterprise, with an emphasis on legal and regulatory trends, assessment measures and audits, tools and procedures, supply chain management, and frameworks.

MSC 810 Product Innovation Management (3 credits) – New product and technology management for technology-intensive firms. Creating new product ideas. Developing and implementing new product and technology strategies.

MSC 833 Decision-making Models (3 credits) – Analytical models to support decision making. Topics include multiple regression, linear optimization, decisions under uncertainty and forecasting.

MSC 888 Capstone Project in Manufacturing (3 credits) – Problem solving in manufacturing. Design of products and processes for manufacturing using a systems approach. Teaming and communication skills are emphasized.

MGT 824 Management and Organizational Behavior (3 credits) – Micro and macro models of organizational behavior applied to the management of people, group processes, and organization design. Motivation, diversity, leadership, group performance, organization structure and culture.



"Since graduating from Michigan State University, I have been working for Ford Motor Company. My career goal is to be a manufacturing leader with a focus on enhancing product characteristics, driving process improvements and working with customers to market and sell product benefits, and I've been able to blend all that I've learned through the M&EM program while at Ford."

Jennifer Cody
Final Assembly Manufacturing Engineer
Ford Motor Co.
MS '01

State of the Art Facilities

The Eli Broad Graduate School of Management offers a world-class learning environment that focuses on experiential learning using hands-on laboratories that include:

- The IBM On-Demand Supply Chain Lab
- The Team Teaching Effectiveness Lab
- The Financial Analysis Lab
- The Center for International Business Education and Research (CIBER)

Laboratories specifically dedicated to the MS Manufacturing and Engineering Management program in the College of Engineering include:

- Computer-Integrated Manufacturing Laboratory
- Controls Laboratory
- Kresge Computer Laboratory for Industrial Design
- Rapid Prototyping Laboratory
- Robotics Laboratory

Other College of Engineering centers and laboratories that support manufacturing research and instructional activities include:

- Composite Materials and Structures Center
- Computational Design Laboratory
- Diamond Micro-Sensor Fabrication Laboratory
- Engine Research Laboratory
- Electronic and Surface Properties of Materials Center
- High-Energy Laser Processing Laboratory
- Micromachining Laboratory
- Pattern Recognition and Image Processing Laboratory



Essential Information

Admission Requirements

Students with an ABET-accredited engineering degree from Michigan State University are eligible for admission if:

1. They have at least a 3.20 cumulative GPA at graduation for all undergraduate courses taken;
2. They have completed a minimum of nine credits of manufacturing engineering or related courses approved by the College of Engineering in their undergraduate degree program;
3. They have completed ACC 201 (Principles of Financial Accounting), ACC 202 (Principles of Management Accounting), and EC 210 (Economics Principles using Calculus) in their undergraduate degree program with a minimum GPA of 3.00;
4. They have completed two semesters of EGR 393, Engineering Cooperative Education, in their undergraduate degree program;
5. They have recently received their engineering degree (students must enter the master's program within nine months of graduating).

Academic Standards

Students who are enrolled in the MS Logistics program are expected to maintain a minimum cumulative grade point average of 3.0.

Laptop Required

A laptop computer is a requirement for participation in the program. The requirement is based on the need for students to communicate with faculty and fellow students via e-mail, convenient use of computers while in class and completion of course assignments. Please inquire as to current configuration requirements.

Financial Aid

The Office of Financial Aid has materials available to MS Manufacturing and Engineering Management applicants. For more information, please contact the Financial Aid Office at 517.432.1759 and identify yourself as a MS M&EM student. Financial aid forms are available on the web at www.bus.msu.edu.

Please refer to the College of Engineering's undergraduate catalog for admission requirements for a particular engineering major.

Faculty Information

MSU enjoys a large and diverse full-time business faculty. Broad School faculty instructors for the MS in Manufacturing and Engineering program are:

Joseph Bonner Ph.D. University of Minnesota	MSC 810
Kenneth K. Boyer Ph.D. The Ohio State University	MSC 803
Mark Johnson Ph.D. Washington State University	FIN 801
Regina McNally Ph.D. University of Illinois at Urbana-Champaign	MSC 805
Steven Melnyk Ph.D. University of Western Ontario	MSC 843
Srinivas Talluri Ph.D. University of Texas	MSC 800, MSC 842
Linn Van Dyne Ph.D. University of Minnesota	MGT 824
Shawnee Vickery Ph.D. University of South Carolina	MSC 833, MSC 888

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