This program guide was compiled in the interest of making the lives of Manufacturing Systems Engineering (MSE) students a little easier and to assist faculty and staff with student advising, course planning, etc. It contains specific information about MSE academic policies and provides helpful information about the university and the city of Madison for those new to the area.

A checklist in the back of this guide should make it easier for students to keep track of their responsibilities and to stay on course for completing their degrees.

Students are encouraged to stop by and meet the MSE staff. You will find that a short conversation with our MSE Graduate Coordinator will usually help get a quick resolution to your questions.

PROGRAM DIRECTOR – Prof. Frank E. Pfefferkorn – pfefferk@engr.wisc.edu
MSE GRADUATE COORDINATOR – Pamela Petersen – prpeters@engr.wisc.edu

MSE Program E-mail - mse@engr.wisc.edu

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   Madison, WI 53706
   USA
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Admissions: msegradadmission@engr.wisc.edu
Phone: 608-263-3955
URL: https://www.engr.wisc.edu/academics/graduate-academics/manufacturing-systems-engineering/
LinkedIn group: https://www.linkedin.com/groups/1882974/

UW Madison Graduate Guide to Student Life:
WELCOME TO THE MSE PROGRAM! We’re glad you chose to become a part of the nation’s premier program in Manufacturing Systems Engineering. Ours was the first program in the United States to award an M.S. degree in the field of Manufacturing Systems Engineering. Regardless of the undergraduate background and industry experience you bring with you, your time here is certain to be challenging and rewarding.

We’re here to support you in your academic success. If you have problems or feedback—positive or negative—please communicate with us so that we can help resolve the issues involved and make your experience here more worthwhile.

You will find our office doors open to you, and we urge you to get to know us so that we can work together most effectively. One thing to keep in mind as you proceed toward your master’s degree in the MSE Program is that you are part of a team with your professors, fellow students and the university administrative staff. This collaboration provides you with a world-class education, but it also places upon your shoulders considerable responsibilities. The quality of your education depends as much on you and the way in which you view your place on this team as it does on us. We are here to help and guide you, but you must take the lead in designing and meeting your own goals and achieving your own objectives.

Our alumni have remarked that Madison is a great place to study and to live, and we hope you will find the time to enjoy the city and surrounding areas. Throughout your time here we will offer you opportunities to socialize with fellow students, faculty members and the MSE staff. We invite you to take advantage of these occasions.

Once again, welcome to the MSE Program. We wish you great success in your studies here and in your career ahead.

Sincerely,

Professor Frank E. Pfefferkorn
Director, Manufacturing Systems Engineering Program
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CHAPTER ONE - ENROLLMENT

ENROLLMENT

Students enroll for courses via the Web and their My UW portal. Set up your Net ID and Password prior to enrollment by going to http://my.wisc.edu. Then login to My UW and click the “Academics” tab to find a link to the “Student Center” where students can manage their schedules.

Students may enroll on or after the enrollment appointment time, which they will receive via e-mail. Newly admitted students will receive an invitation to enroll via U.S. mail that will include an access code for the enrollment process. Students in doubt about their date and time to register or who did not receive an e-mail notice or letter may call the enrollment help line at 608-262-0920 to obtain this information.

Information regarding holds on your enrollment must be directed to the party who placed it.

REGISTRAR’S OFFICE – HOW TO INSTRUCTION ONLINE DEMOS: https://registrar.wisc.edu/howto/

Course Guide information is available on the home page of the Office of the Registrar (http://registrar.wisc.edu/). Course Guide is updated hourly, with the most current date appearing at the bottom of the page.

In addition to enrollment, students may use the My UW-Madison system to check their e-mail, view academic and personal information, and use the calendar feature.

It is important that you keep the university informed of your current address to ensure timely receipt of registration materials. You may access your student record using My UW or via the link at the university’s home page. There are computer terminals in the Memorial Union, Union South, and in many of the COE buildings, should you need them.

Changing your address via My UW has no effect on your payroll records. If you are on the university payroll, stop by the Payroll Office for the department you are being funded by.
You should consult with a faculty advisor before choosing your courses, particularly during your first semester (see the following section).

**Faculty Advisor**

MSE students are required to get a faculty advisor soon after classes begin. All incoming MSW students are assigned the Program Director as their academic advisor, unless they have already identified an academic or research advisor. You do not have to keep the same advisor throughout your time with the MSE Program. If you elect to complete a thesis or independent study a research advisor will also be required to do this. This advisor might not necessarily be the same person as your academic advisor and it is your responsibility to find this additional help.

Chapter Six contains a list of professors associated with the MSE Program, along with their research interests and current projects. You should use this list to approach an advisor who is working on topics that interest you. This list can also help you find a faculty member to provide you with financial support.

For changing the faculty advisor you can email MSE Graduate Coordinator at prpeters@engr.wisc.edu and add a copy to the advisors for their records.

**Study Plan**

You will receive the MSE Study Plan during orientation sessions. Use this sheet as a guideline for your journey through the MSE Program.

1. You must have a new study plan filled out, approved by an advisor and returned to the online student file along with an updated, one page resume (also required each semester). A study plan form is available on the MSE program website: https://www.engr.wisc.edu/academics/graduate-academics/manufacturing-systems-engineering/

Your Study Plan may be changed at any time during your course of study by filling out a new Study Plan sheet and having your advisor approve it. If you have questions regarding this form, please contact the MSE Graduate Coordinator at prpeters@engr.wisc.edu or stop by the CoE Graduate Services Center in room 3182 ME.

**International Student Advising**

The [International Student Services office](#) assists international students, scholars
and their dependent families with non-academic issues upon arrival and throughout their stay at the university. The office provides orientation activities for newly arrived international students, including an introduction to social life and issues at the university, and essential information about immigration regulations and procedures. ISS helps students with their non-immigrant (F or J) visa status and provides information on the benefits of that status as well as on other issues of student life.

You will find the International Student Services office at the Red Gym, 716 Langdon Street, 2nd Floor, Room 217, or you may call 608-262-2044 or e-mail iss@studentlife.wisc.edu. You also may visit the ISS Web site at http://iss.wisc.edu. Please feel free to stop by the CoE Graduate Services Center (room 3182 ME) first with questions or problems.

E-MAIL ACCOUNTS

After you set up your My UW account, your WiscMail account will be active.

To set up your student e-mail account, go to www.wiscmail.wisc.edu, enter your Net ID and follow the instructions. If you need help call the DoIT Help Desk at 608-264-HELP(4357) or email them at help@doit.wisc.edu.

Important information regarding events, classes, deadlines, employment opportunities, etc., is sent to your UW e-mail, so please use your account regularly.

CAE ACCOUNTS

The Computer-Aided Engineering Center (CAE) is another resource for MSE students. Students may activate their CAE accounts via any CAE computer terminal located throughout the engineering campus. The CAE main site is located at the back of 1410 Engineering Drive. If you need help with your CAE account, call a CAE consultant e-mail at helpdesk@cae.wisc.edu.

Instructions for activating your CAE account as well as more detailed information regarding CAE services are also available at their Web site: http://www.cae.wisc.edu/. Use only CAE/WISC accounts for UW-business. Private email services (Gmail, Hotmail, Yahoo, etc.) have risk of compromising confidential information that you might share during your stay at UW-Madison. Refer to the UW’s IT policy at: http://www.wisc.edu/policies/
CHAPTER TWO - CURRICULUM INFORMATION

MSE Course Structure

Each student must take four courses from the three core course areas listed here, at least one from each of the areas. The courses listed in each area are recommended courses only. Other courses that are suitable for a given core area may be offered in future semesters. In addition to the courses from the core areas, students must also complete ISyE/ME 641, and a series of elective courses.

Course Structure Overview

1. 3 credits in each of the three core course areas plus 3 additional credits from one of the core course areas.
2. Capstone Course
3. Elective Courses

- At least 3 credits must be taken in each core course area.
- All students are required to take the Capstone Course, ISyE/ME 641: Design and Analysis of Manufacturing Systems. (See also Capstone Course, p. 14.)
- Elective Courses
- Industry Thesis or Research Thesis (optional).
- For the Industry Thesis or Course Only options, at least 15 credits included in the degree must be made up of course work from the College of Engineering.
- For the Research Thesis option, at least 12 credits in the degree must be composed of course work from the College of Engineering. Any thesis credits taken by the student under the supervision of an advisor will be counted in the department of that professor.
- Students should consult with their advisor concerning deviations from recommended courses.


**Program Options**

Following are the options within the MSE Program. Use these program options as a guide when completing your Study Plan. Students may also pursue an Engineering Management Specialization. Please see p. 15 for more information on how obtain this specialization.

<table>
<thead>
<tr>
<th>COURSE ONLY OPTION</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four courses selected from the Core Course Areas*</td>
<td>12</td>
</tr>
<tr>
<td>Capstone Course (offered in spring semester)</td>
<td>3</td>
</tr>
<tr>
<td>Elective Courses**</td>
<td>12</td>
</tr>
<tr>
<td>Industry Thesis (Not required for courses only option)</td>
<td>3</td>
</tr>
<tr>
<td><strong>MINIMUM TOTAL</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INDUSTRy THESIS OPTION</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four courses selected from the Core Course Areas*</td>
<td>12</td>
</tr>
<tr>
<td>Capstone Course (spring semester)</td>
<td>3</td>
</tr>
<tr>
<td>Industrial Thesis</td>
<td>3</td>
</tr>
<tr>
<td>Elective Courses**</td>
<td>12</td>
</tr>
<tr>
<td><strong>MINIMUM TOTAL</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESEARCH THESIS OPTION</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four courses selected from the Core Course Areas*</td>
<td>12</td>
</tr>
<tr>
<td>Capstone Course (spring semester)</td>
<td>3</td>
</tr>
<tr>
<td>Research Thesis</td>
<td>12</td>
</tr>
<tr>
<td>Elective Courses**</td>
<td>3</td>
</tr>
<tr>
<td><strong>MINIMUM TOTAL</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

*At least one course must be selected from each of the three core areas.

**Up to one credit of Independent Study for an internship may count as elective credit toward the MSE degree. A written report must be approved by the advisor. This credit cannot be used toward fulfillment of the Industry Thesis or Thesis Research requirements.

The vast majority of formal graduate-level courses are not taught every semester. Generally, 400 – 600 level courses are taught once per year, either in the Spring or Fall semester. 700 level and above courses are generally taught once every three to four semesters. Therefore, it is very important to make a plan of study early and meet with your advisor. These rules do not apply to thesis research or independent study courses.

Enrollment Help Desk:  [https://registrar.wisc.edu/enrollhelp/](https://registrar.wisc.edu/enrollhelp/)
1. Fundamentals of Processes and Technology

Courses focus on materials processing and/or manufacturing control systems with a hands-on component as an integral part of the course. Examples of topics include metal cutting and forming, integrated circuit fabrication, welding, casting, polymer processing, and automatic control systems. Faculty may offer new courses each semester, so if you believe that a class fits in this core category but is not listed below, please check with the MSE staff.

- CBE 450 Process Design
- CBE 470 Process Dynamics and Control
- CBE 540 Polymer Science and Technology
- CBE 541 Plastics and High Polymer Laboratory
- CBE 770 Advanced Process Dynamics and Control
- ECE 412 Power Electronic Circuits
- ECE 453 Embedded Microprocessor Systems Design
- ECE 462 Medical Instrumentation
- ECE/NEEP 528 Plasma Processing and Technology
- ECE 549 Integrated Circuit Fabrication Laboratory
- ISyE 415 Introduction to Manufacturing Systems, Design and Analysis
- ISyE 605 Computer-Integrated Manufacturing
- ME 417 Transport Phenomenon to Polymer Processing
- ME 418 Engineering Design with Polymers
- ME 419 Fundamentals of Injection Molding
- ME 429 Metal Cutting
- ME 437 Advanced Material Selection
- ME/ECE 439 Introduction to Robotics
- ME 445 Mechatronics in Control & Product Realization
- ME 446 Automatic Controls
- ME 447 Computer Control of Machines and Processes
- ME 449 Redesign and Prototype Fabrication
- ME 469 Internal Combustion Engines
- ME 565 Power Plant Technology
- ME 514 Additive Manufacturing
- ME/ECE 577 Automatic Controls Laboratory
- ME 601* Fundamentals of Microfabrication
- ME 601* Digital Design and Manufacturing
- ME 717 Advanced Polymer Processing
- ME 720 Advanced Powder Processing and Particulate Engineering
- ME 729 Stochastic Analysis of Machine Tool Dynamics and Control
- ME/ECE 739 Advanced Robotics
- ME 747 Advanced Computer Control of Machines and Processes
- ME/CBE 567 Solar Energy Technology
- MS&E 434 Introduction to Thin-Film Deposition Processes
- MS&E 435 Joining of Materials: Structural, Electronic, Bio and Nano Materials
- MS&E 461 Advanced Metal Casting
- MS&E 462 Welding Metallurgy
2. **Fundamentals of Systems Engineering and Design**

Concentration is on designing products and systems, and integrating these two areas to achieve quality, improve flow, utilization of assets and productivity. Examples of topics include CAD/CAM, computer integrated manufacturing, design for manufacturing, feature-based design methods, industrial ergonomics, and robotics, planning and control of materials and resources, models for system analysis, quality management, and facilities planning. *Faculty may offer new courses each semester, so if you believe that a class fits in this core category but is not listed below, please check with the MSE staff.*

- CBE 430 Chemical Kinetics and Reactor Design
- CIV ENGR 498* Construction Project Management
- CIV ENGR 370 Transportation Engineering
- CIV ENGR 698 Construction Engineering and Management
- COM SCI 755 VLSI Systems Design
- COM SCI 756 Computer-Aided Design for VLSI
- ECE 427 Electric Power Systems
- ME 418 Engineering Design with Polymers
- ME 444 Design Problems in Electricity
- ME 535 Computer-Aided Geometric Design
- ME 549 Product Design
- ME 748 Optimum Design of Mechanical Elements and Systems
- MKTG 427/727 Enterprise Systems and Supply Chain Management
- ISyE/ME 412 Fundamentals of Industrial Data Analytics
- ISyE/ME 510 Facilities Planning
- ISyE/ME 512 Inspection, Quality Control and Reliability
- ISyE 515 Engineering Management of Continuous Process Improvement
- ISyE 516 Introduction to Decision Analysis
- ISyE 520 Quality Assurance Systems
- ISyE 524 Introduction to Optimization
- ISyE/BME 564 Occupational Ergonomics and Biomechanics
- ISyE 575 Introduction to Quality Engineering
- ISyE 601* Digital Manufacturing for Enterprise Systems
- ISyE 601* Introduction to the Internet of Things
- ISyE 612 Information Sensing and Analysis for Manufacturing Process
- ISyE 620 Simulation Modeling & Analysis
- ISyE/ME 643 Performance Analysis of Manufacturing Systems
- ISyE 645 Engineering Models for Supply Chains
- OTM 654 Production Planning and Control
3. **Fundamentals of Business and Management**

Topics studied in this area include acquiring, developing and managing technology and human competencies important to the organization’s survival and growth, the penetration of markets, and measurement of business and operational performance. Examples of topics include manufacturing and technology strategy, organization design, measurement and reward systems, motivation, and the management of change. *Faculty may offer new courses each semester, so if you believe that a class fits in this core category but is not listed below, please check with the MSE staff.*

**ACCT IS 300**/Accounting Principles  
**ACCT IS 710** Managerial Accounting  
**FINANCE 300** Introduction to Finance  
**FINANCE 720** Investment Theory and Practice  
**FINANCE 757** Entrepreneurial Finance  
**ISyE/PSYCH 653** Organization and Job Design  
**MHR 700** Organizational Behavior  
**MHR 710** Challenges and Solutions in Business Sustainability  
**MHR 715** Strategic Management of Innovation  
**MHR 722** Entrepreneurial Management  
**MHR 723** Business Strategy [*non-MBA section*]  
**MHR 734** Venture Creation  
**MHR 741** Technology Entrepreneurship  
**MKTG 300** Marketing Management  
**MKTG 421** Fundamentals of Supply Chain Management  
**MKTG/OTM 722** Logistics Management  
**MKTG 724** Strategic Global Sourcing  
**OTM 752** Project Management [*3-credit option*]  
**OTM 758** Managing Technological and Organizational Change

**Elective Courses**
The MSE Program offers a high degree of flexibility, allowing students to explore a particular field of interest. Electives can be chosen from any of the graduate courses offered at the university, subject to the following:

- All courses must satisfy Graduate School credit requirements.
- The total set of courses on your Study Plan must fulfill the minimum criteria for the MSE degree.
- All courses must be approved by your advisor as forming a coherent
program for the MSE degree.
✓ Students are advised to take graduate courses above 400 level.
✓ Students may choose a sequence of courses that allow them to specialize in an area. Sometimes such a sequence may permit the student to obtain a certificate acknowledging their expertise.

While any graduate-level course may be chosen for electives, the natural places for MSE students to look for relevant elective courses are:

✓ Courses listed under the three Core Course Areas (see pp. 11-13)
✓ Courses in the following departments/schools:
   - All Engineering Departments
   - School of Business
   - Computer Science
   - Statistics

Students may wish to seek the latest information from each department or school for courses and seminars offered during a particular semester.

The vast majority of formal graduate-level courses are not taught every semester. Generally, 400 – 600 level courses are taught once per year, either in the Spring or Fall semester. 700 level and above courses are generally taught once every three to four semesters. Therefore, it is very important to make a plan of study early and meet with your advisor. These rules do not apply to thesis research or independent study courses.

**The Capstone Course**

The only required class, ISyE/ME 641, *Design and Analysis of Manufacturing Systems*, involves case studies of real-world problems from area firms. The course covers a broad range of concepts, techniques and tools relevant to the design, analysis, development, implementation, operation and management of modern manufacturing systems.

*The course consists of two primary components:*

1. Lectures by the course instructor, along with related homework assignments, providing an integrated framework for approaching the design and analysis of modern manufacturing systems.

2. Participation in a 4 – 6 person group project, which works on real-world
The emphasis in this course is breadth of knowledge instead of covering any one topic in detail. Through lectures and projects, the course is intended to create an awareness of the wide range of issues that impact the design and operation of manufacturing systems.

ENGINEERING MANAGEMENT SPECIALIZATION

A student may elect to obtain an Engineering Management Specialization within the MSE degree. For this 30-credit, non-thesis option, the student must fulfill the basic requirements stated on p. 9. As part of the 30 credits, they must take 12 credits from the list below, of which 9 must be from the School of Business. MSE students planning to pursue the Engineering Management Specialization should have good language skills and be prepared to engage in active discussions in the classroom.

① Students choosing this specialization must obtain the approval and signature of Professor Urban Wemmerlöv (4284 Grainger Hall) on their study plan

Required Course

OTM 758 Managing Technological and Organizational Change

* This course and several others below, fulfill the Core Course Area requirement for Business and Management. Students are strongly urged to take OTM 758 in the fall semester of their second year.

Elective Courses

Students must take 9 elective credits from the two areas listed below, with no more than 6 credits from any one area. At least 6 of the credits must be from the School of Business.

ACCOUNTING, FINANCE, AND MANAGEMENT

ACCT IS 710 Managerial Accounting
FINANCE 300 Introduction to Finance
MHR 700 Organizational Behavior
MHR 710 Challenges and Solutions in Business Sustainability
MHR 722 Entrepreneurial Management
MHR 723 Business Strategy [non-MBA section]
OPERATIONS AND TECHNOLOGY MANAGEMENT

ISyE 515  Engineering Management of Continuous Process Improvement Projects
ISyE 653  Organization and Job Design
OTM 751  Service Operations Management
OTM 752  Project Management [3-credit option]

SIX-SIGMA GREEN BELT CERTIFICATION

A students may decide to earn a green belt certification from UW- Madison ISyE department. The Six Sigma Green Belt certificate could be a good learning curve for students. The students will get a chance to analyze and learn quality problems and execute quality improvement projects. This is an optional certificate and requires completion of specialized courses in ISyE domain. Information about requirements could be find on College of Engineering’s website:


Please note that students can appeal for substituting a pre-requisite course with some other course having similar curriculum. The decision to approve the request remains solely with the designated committee.

INDUSTRY THESIS

MSE students may choose to register for 3 credits of Industry Thesis under the supervision of a faculty member. These credits will not count towards any of the core requirements. If the Industry Thesis is in the College of Engineering, you should register using ISyE/ME 790 or any other course number approved by the MSE program. If you are registered with a faculty in the School of Business, you should use Bus 790.

Topic and Advisor

The Industry Thesis can focus on any topic of relevance to the MSE degree and must be selected by the student in conjunction with his/her advisor. For examples, see the list of core course topics. Students are encouraged to select an advisor whose research interests match their own. Students need to select an advisor prior to conducting this study. The advisor provides periodic feedback during the course of the study to ensure that the scope of the work meets the requirement of the MSE Program.
Problem and Problem Environment

The Industry Thesis should focus on a problem taken from industry. Such problems can be identified in two ways:

✓ The problem is a current issue in a particular organization (possibly the firm from which the student is on leave).

✓ The problem is widely described in the literature as being of great relevance to the manufacturing industry.

① It is critical to choose a problem that can be adequately solved within the time available for the Industry Thesis.

Company Visits

Although many types of interactions are possible with companies including conference calls, Skype, and email, the industry visits remain the most effective way to make progress on these projects. Please be on time for such visits and dress in business casual attire.

All company visits made for UW project purposes should be made with a fleet car and personal vehicles should not be used. In order to drive a fleet car, students must first be authorized by the UW Risk Management office. Instructions to become an authorized driver can be found at this link: Click here. Further, for making a reservation for UW fleet car information is provided at

https://transportation.wisc.edu/fleet/fleet-reservation-info/

Please check with the SLC office (room M1002 ECB) for more information about this and other requirements of being an authorized UW driver.

Problem-Solving Methodology

The Industry Thesis should involve a research study of relevant literature, along with an experimental or empirical component of research. The latter should be based on a theoretical construct (hypotheses or ideas for improvement) to be tested and involve data collection and analysis. Alternatively, if the study is of an exploratory nature involving a practical industry project, its outcome should be a theoretical construct suitable for further investigation. Data can be derived from direct experimentation in plants or laboratories (e.g., investigating tool replacement strategies on NC equipment in the laboratory), modeling, or from
interviews and mail surveys (e.g., documenting a firm’s or industry’s adherence to the ISO 9000 standards). Literature reviews are normally not acceptable.

Expected Results

One intention of the Industry Thesis is to expose the student to the systematic problem-solving process: problem formulation, methodology, data analysis, result formulation, documentation and presentation.

A second purpose of the Industry Thesis is for the student to acquire a deeper knowledge in an area of special interest. Therefore, there is no absolute expectation that the findings represent new and unique research results. However, one of the study’s outcomes should be a set of recommendations addressing the specific problem formulated for the study. It is the responsibility of the advisor to decide whether the problem is of sufficient interest to be worthy of a study and to convey to the student the expectations in terms of scope and results.

Documentation and Defense

The MSE Industry Thesis requires a formal written report and a defense presentation in front of a committee of MSE faculty. As a rule, the main body of the report should be approximately 25 pages, single-spaced. The rest of the information should be included in the form of appendices. Length may vary, depending on the subject matter. Consult with your advisor if your report will deviate substantially from the recommended number.

The Industry Thesis must then be orally presented and defended before a committee of at least three MSE faculty members. The student should prepare a 20-25 minute presentation for defense. The defense usually lasts no longer than an hour (including questions).

A successful defense results in the signing of the student’s warrant and receipt of a grade, certifying eligibility to receive his/her master’s degree. (See also Final Examination page 30.)

Copies of the report must be available to the student’s MSE Oral Committee no later than one week before the date of the defense (see Final Examination, p. 30, and Appendix B). These pre-defense copies need not be bound but should be clear and error-free. Check with your Industry Thesis advisor for additional instructions.
Suggested Formats

The following are suggested outlines for Industry Thesis reports. You do not have to follow them exactly; they may be modified to suit your project as based on discussions with your faculty advisor. You may also combine headings if appropriate.

**TITLE PAGE** You may also add an optional page of acknowledgments, thanking people from the company or others who supported your efforts during the project. For sample see Appendix C.

**EXECUTIVE SUMMARY** (1–2 pages) Include the company name, location and product line and a summary of the following: project motivation, project goals and duration, approach and analysis, main insights and recommendations, implementation plans, and relevant issues or challenges.

**TABLE OF CONTENTS** Pages preceding and including the Table of Contents are numbered i, ii, iii; pages after this are numbered 1, 2, 3 ...

**COMPANY BACKGROUND**

**MOTIVATION FOR PROJECT**

**PROJECT GOALS, SCOPE AND DURATION**

**APPROACH or METHODOLOGY**

**DATA GATHERING**

**ANALYSIS** Provide a brief summary of any relevant theory or tools used as well as any assumptions made (or include this in an appendix).

**MAIN INSIGHTS AND OBSERVATIONS**

**MAJOR RECOMMENDATIONS** This is the most important part of your report.

**EXPECTED RESULTS** Quantify the results of your recommendations. If relevant, provide justification, including anticipated costs and benefits (both quantitative and qualitative).

**IMPLEMENTATION ISSUES**

**RECOMMENDED NEXT STEPS or IMPLEMENTATION PLANS**
**LESSONS LEARNED FROM THE PROJECT** These are not recommendations relating to the project goals, but rather what you have learned during the project.

**REFERENCES or BIBLIOGRAPHY**

**APPENDICES** Include details such as company data, drawings, layouts, analyses, tables, spreadsheets, additional graphs, computer printouts for models, etc., that are too long for the main body of the report and not necessary for managerial overview. Appendices should be numbered A, B, C, and their pages should be numbered A–1, A–2, etc.

**INDUSTRY THESIS PROJECT INVOLVING LABORATORY EXPERIMENTS OR SURVEYS**

**TITLE PAGE** (May also add optional page of acknowledgments thanking people from the company or others who supported your efforts during the project.)

**EXECUTIVE SUMMARY** (1–2 pages) This should include a summary of the following: project motivation, project goals and duration, approach and analysis, main insights and recommendations, implementation plans and relevant issues or challenges.

**TABLE OF CONTENTS** Pages preceding and including the Table of Contents should be numbered i, ii, iii ..., and afterwards 1, 2, 3 ...

**MOTIVATION FOR PROJECT**

**PROJECT GOALS AND SCOPE**

**REVIEW OF LITERATURE** Summary of current science in this area.

**APPROACH or METHODOLOGY**

**DATA GATHERING**

**ANALYSIS** In addition to showing the analysis, provide a brief summary of any relevant theory or tools used as well as any assumptions made (or include such details in an appendix).

**RESULTS**
CONCLUSIONS

LESSONS LEARNED FROM THE PROJECT These are not recommendations relating to the project goals, but rather what you have learned during project.

REFERENCES or BIBLIOGRAPHY

APPENDICES Details of items such as experimental data, drawings, survey responses, tables, spreadsheets, additional graphs, computer printouts for models, etc., that are too long for the main body of the report. Appendices should be numbered A, B, C, and their pages should be numbered A-1, A-2 ... B-1, B-2 ... (if you have pages from other sources such as layouts, you may number them by hand).

Research Thesis

The master’s thesis may involve work with industry, empirical effort in a lab, or theoretical study of a topic relevant to the MSE degree. Using a component of research, it should extend the known results and contribute to the knowledge of that particular area of interest. The thesis topic is chosen by the student and is completed under the supervision and review of a faculty advisor. In addition to the written report, the findings are presented and defended orally. The thesis must be taken for a total of at least 12 credits (see Program Options: 30 Credit Thesis Program, p. 9). The documentation and defense guidelines for an MSE thesis is similar to that of the MSE Industry Thesis. The suggested format of the report is given below:

TITLE PAGE (may also add optional page with acknowledgements) See sample cover page in Appendix C.

ABSTRACT (1-2 pages) Include a brief summary of the importance of the research topic, research question being addressed, methodology and approach used, and key findings of the research.

TABLE OF CONTENTS Pages preceding and including the Table of Contents are numbered i, ii, iii; pages after this are numbered 1, 2, 3 ...

INTRODUCTION AND THESIS OUTLINE This chapter should provide motivation for the research question, the approach used in the thesis and provide an overview of the organization of the thesis.
**LITERATURE REVIEW** This includes a critical review of relevant research literature to help position the contribution of this research.

**RESEARCH FINDINGS** This may be split into multiple chapters, each chapter focusing on a particular aspect of the research. The chapter should describe the methodology used and findings obtained from the research.

**SUMMARY OF FINDINGS AND EXTENSIONS** (2-3 pages) This chapter should summarize key findings of the thesis and describe future extensions of this research.

**REFERENCES OR BIBLIOGRAPHY**

**APPENDICES** Include details such as data, drawings, layouts, analyses, tables, spreadsheets, additional graphs, computer printouts for models, etc., that are too long for the main body of the report and not necessary for managerial overview. Appendices should be numbered A, B, C, and their pages should be numbered A–1, A–2, etc.

**INDUSTRY / RESEARCH THESIS GUIDELINES**

Students are required to submit a bound copy of their thesis to the MSE Graduate Coordinator (room 3182 ME). The report must also be submitted electronically (check with MSE Graduate Coordinator for format of submissions), usually on a CD, USB, or pen drive. Graduation warrants are not cleared until a report is submitted. Copies of all thesis are kept by MSE for students to check out and peruse.
CHAPTER THREE - ACADEMIC POLICIES

DEGREE REQUIREMENTS

There are several formal requirements that students must meet in order to be recommended for an MSE master’s degree:

Candidates must satisfy all general regulations of the Graduate School pertaining to the master’s degree and the special regulations of the MSE Admissions Committee. Graduate School Academic Policies and Procedures information can be found online: https://grad.wisc.edu/academic-policies

✓ Candidates must maintain a PCGPA of 3.0 and a minimum PSGPA of 3.0 for the current semester (see next page for PCGPA and PSGPA). A course in which a grade of C or lower was earned will not be counted toward the MSE degree.

✓ At least 30 credits must be completed by a candidate for the master’s degree.

✓ Students may not transfer more than 12 graduate credits from another institution (see Transferring Credits, p. 27, for more information).

✓ For the Course Only and Industrial Thesis option, at least 15 credits included in the degree must comprise course work from an engineering college. For the Research Thesis option, at least 12 credits included in the degree must comprise course work from an engineering college.

① Engineering courses that are cross-listed with non-engineering departments can be used to fulfill this requirement if the course is taught by an Engineering Professor.

✓ Candidates for a double degree should provide each professor or department with a list of the courses to be credited toward that degree. Each list should contain department abbreviations, course numbers and titles, and the number of credits. Note that no more than 25 percent of credits of the program with the lowest credit requirement may overlap between degrees. For example with two 30 credit degrees, 7 credits could be overlapped.
**Course Load**

*Full-Time Students*

All students are admitted as full-time students, unless otherwise noted in writing prior to the beginning of their program. Full-time students are expected to take at least 8 credits of course work during all regular semesters in residence. During the summer session a graduate student must take 2 credits to maintain full-time status. For more information on this subject please see the Enrollment Requirements section of the Graduate School’s Academic Policies at: [https://grad.wisc.edu/academic-policies/](https://grad.wisc.edu/academic-policies/)

*Part-Time Students*

Students must have prior approval from the MSE Program to become part-time students. There are no special credit-load requirements imposed on approved part-time students.

**Grades**

Students must maintain a grade-point average of 3.0 (4.0 scale) in all graduate work, both for the current semester and cumulatively. A course in which a grade of C or lower is received will not be counted toward the MSE degree.

**Grade Point Average**

Courses taken while enrolled as a graduate student in the MSE Program and all other courses presented toward the degree are included in the computation of the Program Semester Grade Point Average (PSGPA), except for the following:

- Courses lower than the 300 level in any department
- Courses above the 300 level in any department that are not included in the Graduate School Bulletin

The computation of the Program Cumulative Grade Point Average (PCGPA) will follow the same conditions defined above for the PSGPA.

A PSGPA and a PCGPA of at least 3.0 are required for satisfactory academic progress. Students taking only independent-study or thesis-research credits and receiving grades of P or S will be judged to be making satisfactory academic progress.
Students admitted on probation may be required to obtain a PSGPA higher than 3.0 in the first semester, as specified in writing at the time of admission. (See Probation, below, for the relevant policy.)

SECOND MASTER’S DEGREE

To be eligible to earn a second master’s degree, students must have earned credits to satisfy requirements of both degrees. Note that no more than 25 percent of credits of the program with the lowest credit requirement may overlap between degrees. (See sample letter in Appendix D)

When you submit your study plan you should include the plans for second degree as well. Clearly indicate overlapping credits between the two programs.

TIME LIMIT

A full-time student must complete the MSE degree requirement by the end of the fourth semester of full-time graduate study in the program. Any student exceeding this time limit will be automatically placed on probation, unless the time limit has been extended by the MSE director.

No particular time limits are imposed on part-time students, as long as their graduate studies are continuous.

PROBATION

New Students

An applicant for graduate study in the MSE Program who does not meet the normal requirements for admission may be recommended for admission on probation by the Admissions Committee.

Continuing Students

Students previously admitted for graduate study in the MSE Program will be placed on probation if they fail to make satisfactory academic progress, as defined by the current MSE Degree Requirements.

Term of Probation

The probationary status of each student in the MSE Program will be reviewed at the end of each semester. A student placed on probation who fails to qualify for removal of probation at the next review of his/her probationary status (normally
performed the following semester) will not be permitted to continue graduate studies in the MSE Program.

**Removal of Probation**

✓ A student admitted on probation will be removed from probation if that student (a) has met all special conditions specified in the letter from the MSE Program notifying the student of admission, and (b) is making satisfactory academic progress according to the current policy of the MSE Program.

✓ Continuing students on probation will be removed from probation if they are deemed to be making satisfactory progress according to the current MSE Program policy and if they are full-time students with a minimum GPA of 3.25 and no grades of Incomplete.

✓ A student may be removed from probation by special action of the MSE Program Director.

⚠️ A student will not be recommended for a graduate degree in Manufacturing Systems Engineering while on probation.

**Transferring Credits**

**Criteria**

✓ A maximum of 12 credits may be transferred from another institution and counted toward the MSE degree.

✓ Only courses taken in the last five years may be accepted for transfer.

✓ Students who change from Special Student status at the UW to Graduate Student status may transfer their Special Student credits. However, see p. 28 for details on this policy.

✓ Transferred courses must fit into the student’s Study Plan. Any request for transfer must first be approved by the student’s advisor and then submitted for approval to the Curriculum, Policy and Exams Committee.

✓ Each course must be the equivalent of a 3 credit-hour semester graduate course. Two courses taken under a quarter system may be counted as one
semester course.

- The student must have earned a grade of at least a B (or equivalent) in each transferred course.

- No credits may be transferred in place of the following courses: Independent Study, ISyE/ME 641 Design and Analysis of Manufacturing Systems, and OTM 758 Managing Technological and Organizational Change.

**Procedure**

The student, after meeting the above criteria, must file a written request with the MSE Curriculum, Policy and Exams Committee for credit transfer (see Appendix E for sample letter). Students must complete the MSE Course Transfer/Substitution Request form for each course request to be reviewed. Forms are located on the MSE Program Website: [https://www.engr.wisc.edu/app/uploads/2018/07/MSE-Course-substitution-with-Transfer-Application.pdf](https://www.engr.wisc.edu/app/uploads/2018/07/MSE-Course-substitution-with-Transfer-Application.pdf)

The request and the supporting documentation that follow should be submitted to MSE faculty advisor (see also *Petition Deadlines*, p. 29).

**Required Documentation**

- Description of course content and course material, i.e. syllabus

- Official transcripts indicating when the course was taken, and the grade received

- Evidence of course length (number of class hours)

- A statement indicating similarity to existing course(s) at UW-Madison.

- Letter of approval from the instructor of the course here at UW-Madison that most closely matches the one taken. The letter from the UW instructor should verify the similarity of the two courses and the depth of the material covered.

- The signature of the student’s advisor on the cover letter of the request indicating approval of the credit transfer
Special Student Credits

If a student wishes to use any Special Student credits to meet the MSE degree requirements, these credits must be transferred to Graduate Student credits. If you are a Special Student transferring credits to the MSE Program, you must have a letter from your advisor, and you will be charged for the difference in tuition between Special Student credits and Graduate School credits. This balance must be cleared before a warrant can be issued (see Appendix F for a sample letter). Forms are located on the MSE Program Website:

According to Graduate School requirements, Special Student credits can be transferred only in semester blocks; all credits earned during a given semester must be transferred.

Course Substitution

Students may choose to deviate from the recommended course list when creating their Study Plan. Students wishing to do this must file a written request with the MSE Program Director:

- Write a petition to the Director requesting substitution of a course.
- Indicate what course you plan to take and the core area to which you would like it applied.
- Include a copy of the course description from the Bulletin.
- Get your advisor’s signature on the petition, along with yours, and submit it to the Director via online student file Box system.

Petition Deadlines

Requests for credit transfers, course substitutions and other academic policies relating to the Program requirements must be submitted to online student Box File System on or before October 15 for a decision to be reached during the fall semester and on or before March 1 for a decision to be made during the spring semester.
Final Examination for Thesis

Examination Committee

The examination is oral and administered by a committee of three faculty members: two MSE faculty members (including one MSE Executive Committee member other than the student’s advisor for the Research/Industry Thesis), and a third member who may be a university faculty member at large.

The student and his/her advisor should work together to select the other two committee members. However, it is the student’s responsibility to secure the participation of each committee member and to identify an agreeable date and time for the oral examination.

Copies of the final report should be given to Examination Committee members at least one week in advance of the student’s defense date.

Your Research/Industry Thesis advisor may need to review this document and you check with them about their expectations regarding a timeline for review.

Examination Format

The first 30 minutes of the examination will be devoted to the student’s presentation of his/her project work. The balance of the examination will consist of a question-and-answer period regarding the presentation topic, relevant related topics, and a discussion of the student’s overall academic program and experience.

Exam Room

To reserve a room in ME, please stop by the MSE Student Services Office (3182 ME). Because space fills quickly toward the end of the semester, make your reservation as early as possible. Be sure to make clear the number of people you expect and ask if the room you are getting has any AV equipment. Once you have made your reservation, please inform the MSE Graduate Coordinator.
GRADUATION PROCEDURES

At the beginning of each semester, you will receive an e-mail notification from the MSE Graduate Coordinator confirming your intent to graduate based on the anticipated graduation date listed on your MSE Study Plan with instructions on how to request your final MS degree warrant.

Countdown to Commencement is designed to guide graduates through the many procedures and deadlines associated with commencement. Contact the MSE Graduate Coordinator immediately if you intend to graduate at the end of the semester and have not been notified.

WARRANT

To request a final warrant, students should complete a final requirements program planning grid forms found on the MSE website:

https://www.engr.wisc.edu/academics/graduate-academics/manufacturing-systems-engineering/

Submit the completed form to their online student file Box System. Once saved, students should email the MSE Graduate Coordinator (prpreters@engr.wisc.edu) with confirmation the form has been completed and a warrant will be requested from the Graduate School. It is the student’s responsibility to pick up his/her warrant from the MSE Graduate Coordinator prior to the examination, bring it to the examination, and then return it to the MSE Graduate Coordinator after the examination. Please update the MSE Graduate Coordinator on your progress towards graduation at least once a month during your final semester to ensure that graduation deadlines and requirements are met satisfactorily.

COMMENCEMENT CEREMONY

MSE students may participate in commencement activities, held in May and December. For details, call 608-262-9076. The ceremony is organized by the secretary of the faculty office in 133 Bascom Hall 608-262-3956. For further information visit http://www.secfac.wisc.edu/commence/
CHAPTER FOUR - FINANCIAL AID

FELLOWSHIPS AND SCHOLARSHIPS

Financial aid, in the form of research and teaching assistantships, is available on a competitive basis from the MSE Program. Faculty associated with the MSE Program may also be contacted directly regarding funding opportunities. The Graduate School offers aid in the form of fellowships and grants for which students are nominated by their department. Students should contact the Graduate School for a complete listing of fellowships, which can include comprehensive health insurance and remission of the out-of-state portion of tuition.

_The Graduate School_, 217 Bascom Hall, has information regarding fellowships at:

https://grad.wisc.edu/funding/

_The McBurney Center_, 1305 Linden Drive, Room 258, administers a variety of scholarships intended to assist the educational advancement of people with disabilities. Call 608-263-2741 or visit the Web site: www.mcburney.wisc.edu

_UW-Madison Continuing Studies Adult & Student Services_, located at 21 Park Street 7th floor, provides information about various financial aid resources for returning adult students. Call 608-263-6960 or visit the Web site: https://continuingstudies.wisc.edu/

_The Office of Student Financial Aid_, 333 East Campus Mall #9701, has applications for graduate student loans and information about student employment opportunities. Call 608-262-3060 or visit the Web site: www.finaid.wisc.edu

_The Grants Information Collection_ in the Reference Department of Memorial Library (Room 262) has reference books and other publications about fellowships and scholarships. Call 608-262-6431 or visit the Web site: http://grants.library.wisc.edu

International students are eligible for consideration for Graduate School fellowships only if their undergraduate institution’s language of instruction is English or if they have completed, at the time of nomination, the equivalent of at least two semesters of full-time study at an institution in the United States. Occasionally the International Student and Scholars Services receives information about scholarships available to international students (see _International Student..._
HELPFUL PUBLICATIONS

Following is a list of publications available from libraries, UW-Madison, or directly from an organization. The list is by no means comprehensive but should provide you with a good start.

*The Annual Register of Grant Support.* Published by the National Register Publishing Company, this is one of the largest collections of funding sources. Find the Register in the Grants Information Collection and in the Graduate School’s Office of Fellowships and Minority Programs.


*Grants for Graduate Study (3rd Edition).* Compiled by the Graduate School of the University of Massachusetts at Amherst, this publication is available through Peterson’s Guide, P.O. Box 2123, Princeton, NJ 08543–2123. Phone: 609-243-9111.

FINANCIAL SUPPORT

The Manufacturing Systems Engineering Program is unable to provide any funding to students. Students seeking financial support through Research Assistantships (RA) and Project Assistantships (PA) are encouraged to speak directly to professors affiliated with research programs/centers that they wish to work on. Students seeking financial support through Teaching Assistantships (TA) are encouraged to directly contact the Department which offers the course they are interested in TAing for. Please note that each department may require students who are supported as an RA, PA, or TA to be enrolled in a minimum number of credit hours. Some of the potential openings are often shared on [https://studentjobs.wisc.edu/](https://studentjobs.wisc.edu/)
CHAPTER FIVE - SERVICES AND GENERAL INFORMATION

The MSE Program receives numerous announcements of job opportunities and semester or summer internships for students and graduates. Check your e-mail regularly for them.

For this reason, an updated copy of your resume is required every time you submit a new study plan to the MSE program via the online student Box File System.

ENGINEERING CAREER SERVICES (ECS)

Engineering Career Services (ECS) is a department within the College of Engineering that helps students and recent graduates find jobs in their field. They sponsor a career fair, usually the 2nd week, each semester. You’ll find the office in 1150 Engineering Hall, 1415 Engineering Drive, or you may call 608-262-3471 or see https://ecs.wisc.edu/. ECS provides:

✓ On-campus contact with 300–500 employers each year

✓ 8,000–10,000 on-campus interviews annually

✓ Software for résumé/CIF (College Interview Form)

✓ Students are strongly encouraged to seek help from ECS with résumé writing, interviewing skills, proactive job search, follow up and mock interviews

✓ Individual career advising and résumé review

✓ Salary statistics for UW-Madison and national grads

EMERGENCIES

Friends and family may use the MSE Program Director’s office phone number, 608-263-2668, as an emergency number only. Other emergency numbers are:

Dane County 911 service—in case of emergency dial 9-1-1

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Dean of Students, 109 Bascom Hall, 608-263–5700

University Counseling Services, 608-262–1744

Acute Psychiatric Service, 608-263–6140

Mental Health Center of Dane County, 608-280–2600 (24–hour crisis line)

UW Hospital Emergency Room, 608-262-2398

Meriter Emergency Room, 608-267-6000

ATHLETIC FACILITIES

There are several athletic facilities available to students. Call each for specific building hours and available equipment or visit the following Web site to find links to each facility and more information on university recreation: www.recsports.wisc.edu.

Camp Randall Memorial Sports Center ("The Shell")
Hotline/Building Hours 608-263-4753
Front Desk 263-6566

Natatorium
Reservations 608-262-3742
Hotline/Building Hours 262-3742

Nielsen Tennis Stadium
Reservations 608-262-0410

Southeast Recreational Facilities (SERF) *** Currently Under Construction ***
Reservations/Office 608-262-8244
Hotline/Building Hours 608-262-4756

Intramural Programs
608-262-4976

Club Sports
608-262-9696
**Banking Services**

There are many financial institutions close to the engineering campus. Please consult the Madison area phone directory for a complete list.

**Health Insurance**

Affordable comprehensive medical coverage is available for registered students and their families, provided through UW-Madison by Physicians Plus Insurance Corporation.

The Student Health Insurance Plan (SHIP) is designed for international students, visiting scholars and their families. SHIP is also available to U.S. students opting for a university-sponsored health-insurance plan.

This is a comprehensive HMO-type plan covering emergency treatment, hospitalization and pre-existing conditions. In compliance with university policy and federal regulations, all international students will have to purchase SHIP coverage for themselves and their dependents residing in the United States unless they can provide proof of continuous enrollment in a health-insurance plan with comparable benefits. For more information about coverage and eligibility, contact:

- University Health Service (www.uhs.wisc.edu)
  333 East Campus Mall
  Madison, WI 53715-1382
  608-265-5600

- SHIP Program (7th floor) [https://www.uhs.wisc.edu/ship/](https://www.uhs.wisc.edu/ship/)
  608-265-5232
  ship@uhs.wisc.edu

Students who have received Research Assistant (RA), Project Assistant (PA) or Teaching Assistant (TA) appointments should see the financial assistant/payroll office staff in the department where they received the appointment (e.g., ME, ISyE, etc.) within the first two weeks of their appointment for details about health insurance.

**Housing**

Apartments farther from campus tend to be more affordable than those closer to campus. Most leases are for one year and begin in mid-August. *The Campus Assistance Center* at the Red Gym, 716 Langdon St., 608-263-2400, maintains fairly
comprehensive and current lists of available housing. Please also see the center’s Web site, which allows you to do an online search for available housing: www.housing.wisc.edu.

*The University Housing Office* in Slichter Hall, 625 Babcock Dr., provides assistance with university–owned housing. Call 608-262-2522 or see the Web site: www.housing.wisc.edu

Rental listings can also be found in local newspapers such as *The Isthmus, The Capital Times* and *The Wisconsin State Journal* as well as UW’s campus newspapers. Inexpensive semester sublets often are advertised on bulletin boards, kiosks and telephone poles.

**Library Services**

The University of Wisconsin library system consists of Memorial Library, 728 State Street, 608-262-3193, as well as several departmental libraries. A complete list of library facilities is available at [https://www.library.wisc.edu/](https://www.library.wisc.edu/). Students can also use the website to book study rooms.

Students can raise an Interlibrary Loan (ILL) request for the materials which are not currently available within UW-Madison or UW system collections.

**Writing Center**

The UW Writing Center offers short classes (one or two sessions in most cases) on how to become more effective at writing all kinds of documents, including academic papers, résumés and cover letters as well as other items. Classes are free to UW students. If you would like some guidance with writing (particularly if English is not your first language), check out all of the resources at [www.wisc.edu/writing](http://www.wisc.edu/writing) or visit the Writing Center at 6171 Helen C. White Hall.

**Office Staff**

The MSE Graduate Coordinator is Pam Peterson ([prpeterson@engr.wisc.edu](mailto:prpeterson@engr.wisc.edu)). Please stop by her office in the CoE Graduate Services Center in 3182 ME with any problems or questions. Keep in mind that as a graduate student you will deal with the Graduate School, the Registrar’s Office, Bursar’s Office, Parking and Transportation, etc. Although these are your responsibilities, we offer assistance and advocacy with all university offices.
Parking

Parking on the UW-Madison campus can be challenging. Students may apply for a Lot 60 parking permit at the Transportation Services Office, 124 WARF, 608-263-6666. Applications for the following year become available after the third week in August. Parking permits are usually granted only to students who are commuting from outside of Madison. Check with the Transportation Services Office for current prices of parking permits and campus bus passes.

Post Office

Stamps can be purchased at the Post office on Lake Street.

University Activities

Because you are a student, you are entitled to student discounts at athletic events and musical/theatrical performances sponsored by the university. You need only show your valid student ID. Other local organizations and businesses also frequently offer student discounts. The Division of Information Technology (DoIT) on campus also offers substantial student discounts on new computers and other hardware.

University Vehicles

In order to use university vehicles, each MSE student must complete a Student Driver Authorization Form and sign a Vehicle User Agreement Form, available from the SLC website. If approved, a Driver Authorization Card will be issued. You are required to carry this card with you whenever you drive a university vehicle.

A student must have at least two years of licensed driving experience in order to be eligible for the Driver Authorization Card. There are no exceptions to this rule. The MSE Program and UW Risk Management reserve the right to deny any student a Driver Authorization Card or an appeal.

Wisconsin Hoofers

Wisconsin Hoofers is the premier outdoors club of the University. Students can learn outdoor skills like mountaineering, hiking, riding, sailing, scuba, skiing and snowboarding. More information about how to join the club can be found at the link: https://www.hoofers.org/
TEAM LAB

The CoE Technical Education and Manufacturing Lab (TEAM Lab) provides University of Wisconsin engineering faculty, staff, and students with the majority of the tools and equipment found in a modern machine shop including CNC mills, lathes drill presses, grinders, belt sanders, band saws etc to name a few. Students need to obtain permits (categorized as blue, red, green) to use the fabrication facilities. More information about TEAM lab can be found at: https://teamlab.engr.wisc.edu/

MAKERSPACE

The Makerspace is the student-run, rapid prototyping facility that is part of the Grainger Engineering Design Innovation Lab. Students can collaborate to build anything here: from micro to macro and from virtual to the physical. This is a good avenue for students to have some hands-on learning. The one $50/semester fee also grants students access to TEAM lab. The fee is not required though just if students don’t plan to use the equipment. Detailed policies and description about the facility is available at https://making.engr.wisc.edu/
CHAPTER SIX - FACULTY AND THEIR RESEARCH INTERESTS

**Gregory A. DeCroix**
Grainger Professor in Supply Chain Management
Academic Director, Grainger Center for Supply Chain Management, Operations & Information Management
Wisconsin School of Business
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E-mail: gdecroix@bus.wisc.edu
Website: [https://bus.wisc.edu/faculty/greg-decroix](https://bus.wisc.edu/faculty/greg-decroix)

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**Kaibo Liu**
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**Miron Livny**
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CTO, Wisconsin Institutes for Discovery
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E-mail: miron@cs.wisc.edu

**Ella Mae Matsumura**
Professor, Accounting & Information Systems
Director of Beyer Center
Senior Associate Dean for Academic Programs
Wisconsin School of Business
Room 4250D Grainger Hall, Telephone: 608-262-9731
E-mail: ematsumura@bus.wisc.edu
Website: https://bus.wisc.edu/faculty/ella-mae-matsumura

Sangkee Min
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E–mail: sangkee.min@wisc.edu
Website: https://directory. engr.wisc.edu/me/Faculty/Min_Sangkee/

Michael Oliva
Professor, Civil and Environmental Engineering
Room 2212 Engineering Hall, Telephone: 608-262-7241, 608-262-7204
E–mail: oliva@engr.wisc.edu
Website: https://directory. engr.wisc.edu/cee/faculty/oliva_michael

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Website: https://directory. engr.wisc.edu/me/Faculty/Osswald_Tim/

Frank E. Pfefferkorn
Associate Professor, Department of Mechanical Engineering
Director, Manufacturing Systems Engineering Program
Room 1031 Mechanical Engineering Building, Telephone: 608-263-2668
E-mail: frank.pfefferkorn@wisc.edu
Website: https://directory. engr.wisc.edu/me/Faculty/Pfefferkorn_Frank/

Robert G. Radwin
Professor, Industrial and Systems Engineering and Biomedical Engineering
Director, Ergonomics Analysis and Design Consortium
Room 2128 Engineering Centers Building, Telephone: 608-263-6596, 608-263-4660
E-mail: radwin@engr.wisc.edu
Website: https://directory. engr.wisc.edu/ie/Faculty/Radwin_Robert/

Bin Ran
Associate Professor, Civil and Environmental Engineering
Director of Wisconsin Traffic Lab
Room 1212 Engineering Hall, Telephone: 608-262-0052
E-mail: bran@engr.wisc.edu
Website: https://directory. engr.wisc.edu/cee/faculty/ran_bin

Shiva Rudraraju
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Room 2250 Mechanical Engineering Building
Email: shiva.rudraraju@wisc.edu
Website: https://directory. engr.wisc.edu/me/Faculty/Rudraraju_Shiva/

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Professor, Industrial and Systems Engineering
Room 3250F Mechanical Engineering Building, Telephone: 608-265-5969
E-mail: leyuan@engr.wisc.edu
Website: https://directory.engr.wisc.edu/ie/Faculty/Shi_Leyuan/

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Website: https://directory.engr.wisc.edu/ep/faculty/sridharan_kumar

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Website: https://directory.engr.wisc.edu/mse/Faculty/Stone_Donald/

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Professor, Mechanical Engineering
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Website: https://directory.engr.wisc.edu/me/Faculty/Suresh_Krishnan/

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Co-Director, Polymer Engineering Center
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E-mail: turng@engr.wisc.edu
Website: https://directory.engr.wisc.edu/me/Faculty/Turng_Lih-sheng/

Raj Veeramani
Professor, College of Engineering and School of Business
Robert A. Ratner Professor
Executive Director, UW E-Business Consortium
Founding Director, UW IoT Systems Research Center
Room 4101 Mechanical Engineering Building, Telephone: 608-262-0861
E-mail: raj.veeramani@wisc.edu
Website: https://directory.engr.wisc.edu/ie/Faculty/Veeramani_Raj/

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Website: https://directory.engr.wisc.edu/ie/Faculty/Wang_Xin/

Urban Wemmerlöv
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Kress Family Professor of Productivity and Quality
Wisconsin School of Business
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E-mail: urban.wemmerlov@wisc.edu
Website: https://bus.wisc.edu/faculty/urban-wemmerlov

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E-mail: szhou@engr.wisc.edu
Website: https://directory.engr.wisc.edu/ie/Faculty/Zhou_Shiyu/

Michael Zinn
Associate Professor, Mechanical Engineering
Room 3043 Mechanical Engineering Building, Telephone: 608-262-2893
E-mail: mzinn@wisc.edu
Website: https://directory.engr.wisc.edu/me/Faculty/Zinn_Michael/
2019-2020 Executive Committee

Jingshan Li  
Industrial and Systems Engineering

Ella Mae Matsumura  
School of Business

Tim Osswald  
Mechanical Engineering

Frank Pfefferkorn, MSE Program Director  
Mechanical Engineering

Robert Radwin  
Industrial and Systems Engineering

Leyuan Shi  
Industrial and Systems Engineering

Lih Sheng (Tom) Turng  
Mechanical Engineering

Raj Veeramani  
Industrial and Systems Engineering

Urban Wemmerlöv  
School of Business

Shiyu Zhou  
Industrial and Systems Engineering
APPENDICES

APPENDIX A: STUDY PLAN

The MSE study plan should be turned by the end of the 4th week of classes along with an updated copy of your résumé. The study plan can be updated as frequently as you desire during the course of the semester.

If you are completing more than one degree, please include a separate study plan for the other program you are pursuing as well and indicate which of the credits you intend double count. For example, if you are enrolled in the 30 credit MSE Program and doing an ISyE degree for 30 credits you may overlap 7 credits.

All MSE students are given an online student folder through the University of Wisconsin-Madison Box system https://it.wisc.edu/services/box/.

Students can login using their netID and password. Each student will have a folder in their Box System where s/he can upload and save required documents, resume, planning grids etc... to assist with program planning as well the system allows students to receive faculty approval and signatures digitally during their program as needed. Students are emailed with instructions on how to access Box within the first week of the semester.
### Study Plan - Manufacturing Systems Engineering

<table>
<thead>
<tr>
<th>Name:</th>
<th>Campus ID #:</th>
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<td>Advisor:</td>
<td>Date:</td>
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<td>Option:</td>
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**Semester 1 –**

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<th>Course Name</th>
<th>Credits</th>
<th>Core Category</th>
<th>Grade</th>
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**Semester 2 –**

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<th>Grade</th>
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**Semester 3 –**

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<th>Core Category</th>
<th>Grade</th>
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**Semester 4 –**

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<th>Credits</th>
<th>Core Category</th>
<th>Grade</th>
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</table>

**Summary:**

Total Number of Credits: ___________________________

Total Number of Engineering Credits: ___________________________

Approval of Advisor: ___________________________

Eng. Management Specialization Approved: ___________________________

Please submit approved copy to the MSE Graduate Coordinator, 3182 ME.

Attach a copy of your résumé with this study plan.
APPENDIX B: INDUSTRY/RESEARCH THESIS TIMELINE

1. First semester in the Program: Student chooses a potential advisor from list of MSE faculty (Chapter Six).

2. Second semester in the program student drafts a list of potential thesis topics: Student and advisor meet, determine whether advisor’s research interests and current projects coincide with student’s potential thesis topics. If there is not a match, student reviews MSE Program Guide and contacts another potential advisor. If there is a match, student and advisor choose one or two topics upon which to focus discussion.

3. By the end of the second semester in the Program: Decide on thesis topic. The student and advisor should either narrow or broaden the scope to meet the requirements of a thesis. Is this to be a lab research project or a project with a company? Is the final project report to be an Industry Thesis or a Research Thesis? (See Industry Thesis, p. 16, and Research Thesis Requirements, p. 22, for more information.)

4. By the end of the second semester in the Program: Student and advisor develop an outline of the process required to solve the defined problem.

5. Beginning of the third semester in the Program: Based on initial research, student modifies topic to address initial findings or experiences (i.e. availability of research material). At this point, the student also registers for at least 3 credits of Research Thesis with the advisor (see pg. 9, Manufacturing Systems Engineering Course Structure).

Or

6. Beginning of the third semester in the Program: Student and advisor meet with sponsoring company for project, make any modifications to the topic or problem, and clearly define the goal of the project. The student registers at this time for at least 3 credits of Industry Thesis with advisor.
7. Beginning of the final semester of the Program: Student must submit to the MSE office a packet of graduation materials. The MSE office sends out an e-mail announcing the deadline for these documents at least four weeks before they are due.

8. Beginning of the final semester of Program: Student presents advisor with an outline of the final independent study/thesis report.

9. Eight weeks before student plans to defend: Student presents advisor with a first draft of the thesis for initial feedback and edits. At this point, they jointly select the potential thesis defense committee, and the student approaches these professors with potential defense dates. (See Final Examination, p. 30.)

\* At this point, the student is required to submit the necessary forms to the MSE Graduate Coordinator (room 3182 ME) and consult with staff about the defense date and chosen committee.

10. At least one week prior to defense date: Student distributes to the defense committee members an advisor–approved final draft of thesis report.

11. At the date selected, the student defends the thesis before a committee of three faculty members. See p. 30 of the MSE Handbook for specific requirements regarding this committee.

12. After completing edits required by the defense committee, the student brings one bound copy of the report to the MSE Graduate Coordinator. Students are responsible for creating and distributing final copies for thesis advisor and/or other committee members. If the thesis was conducted at a QRM company, the student will need to submit to the MSE Graduate Coordinator one bound copy, one unbound copy and the electronic file.

\* Industry/Research Thesis process often lasts 2–3 semesters from the date of your first meeting with the professor advising you. It is essential that you plan for this lead time in order to deal with contingencies such as changes in schedule or project goals, additional research and numerous other factors.
Reducing Manufacturing Lead-Times by Implementing Cells in a High Mix Environment

at

XYZ Corporation
Any Town, Wisconsin

An Industry/Research Thesis for the Manufacturing Systems Engineering Program, University of Wisconsin - Madison

Submitted by
John Doe

Advised by
Professor Tom Cruise

May 2012

Manufacturing Systems Engineering Program
University of Wisconsin-Madison
1513 University Ave, 3182 ME
Madison, WI 53706
Tel: 608-263-3955
Fax: 608-890-2204
http://msepweb. engr.wisc.edu/
APPENDIX D: SECOND MASTER’S DEGREE LETTER

March 8, 2011

Ms. Alexandra Walter
Graduate Coordinator
The Graduate School
217 Bascom Hall
500 Lincoln Drive
Madison, WI 53706

Re: Course credits for 2nd degree in MSE

Dear Ms. Hsu:

Below is a list of the courses I would like to count toward my M.S. in Manufacturing Systems Engineering. If you have questions, please contact me.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 512</td>
<td>Inspection, Quality Control &amp; Reliability</td>
<td>3 credits</td>
</tr>
<tr>
<td>BUS 703</td>
<td>Organizational Behavior</td>
<td>3 credits</td>
</tr>
<tr>
<td>ISyE 699</td>
<td>Electronics</td>
<td>3 credits</td>
</tr>
<tr>
<td>ME 429</td>
<td>Metal Cutting *</td>
<td>3 credits</td>
</tr>
<tr>
<td>ISyE 691</td>
<td>CIM</td>
<td>3 credits</td>
</tr>
<tr>
<td>ISyE 691</td>
<td>Quality Engineering</td>
<td>3 credits</td>
</tr>
<tr>
<td>ISyE 575</td>
<td>Intro—Quality Engineering</td>
<td>3 credits</td>
</tr>
<tr>
<td>ME 641</td>
<td>Design/Analysis of Manufacturing Systems *</td>
<td>3 credits</td>
</tr>
<tr>
<td>ISyE 790</td>
<td>Independent Study</td>
<td>3 credits</td>
</tr>
<tr>
<td>ME 446</td>
<td>Automatic Controls</td>
<td>3 credits</td>
</tr>
</tbody>
</table>

Total 30 credits

Thank you for your help.

Sincerely,
Benjamin R. Student
(ID 900 123 4567)

*Course counts toward both M.S. in MSE and M.S. in ME.
Note: The maximum a student can double-count is 25 percent of credits for a degree with fewer credits.
Appendix E: Credit Transfer Letter

March 8, 2011

MSE Curriculum, Policy and Exams Committee
Manufacturing Systems Engineering Program
3182 Mechanical Engineering Building
1513 University Avenue
Madison, WI 53706

Re: Transfer of credits for course substitution

Dear Committee Members:

I am writing to request transfer of the course ME 867 Manufacturing Stuffits that I took at the University of Somewhere, State, in fall 2011, toward the MSE degree. The course description, statement of similarity to a course offered at UW-Madison and transcripts verifying my grade for the course are attached.

Please accept this course as a substitute for ME 555 Manufacturing Widgets that is in the Core Course Area of Manufacturing Processes and Control.

Sincerely,

Joseph P. Student

Joseph P. Student
(ID 8756785678)

I support this request.

Advisor Name

Signature ___________________________ Date ________________

This form can be found on the link below:

APPENDIX F: SPECIAL STUDENT LETTER

March 8, 2011

Ms. Elena Hsu
Graduate Coordinator
The Graduate School
217 Bascom Hall
500 Lincoln Drive
Madison, WI 53706

Re: Transfer credits for MS in MSE degree

Dear Ms. Hsu:

I am writing to request that the 6 credits of graduate level work completed by my student, Jennifer A. Student (ID 900 567 7890), during the fall 2010 and spring 2011 semesters be transferred and counted toward her degree requirements. Ms. Student will complete her master’s in the Manufacturing Systems Engineering Program in May 2012 and needs these credits to satisfy the degree requirements for graduation.

Thank you.

Sincerely,

John A. Advisor

Professor of Industrial and Systems Engineering

This form can be found on the link below:

APPENDIX G: CHECKLIST FOR SUCCESSFUL PROGRESS IN THE MSE PROGRAM

Before Arriving at the University of Wisconsin-Madison:

- Activate your My UW student account
- Enroll in classes through the My-UW Madison portal
- Visit the Graduate School New Student Website information: https://grad.wisc.edu/new-students/

Arrived at UW, Attending Classes:

- Open a CAE e-mail account
- Attend New Student Orientation Events
- Register with Engineering Career Services: https://ecs.wisc.edu/
- Select a research advisor if you are pursuing a research thesis or industry thesis option
- Fill out your MSE Study Plan along with a current copy of your resume to have approved by advisor and uploaded to online student file Box System by the eighth week of class
- Check your Email regularly for important announcements
### Appendix H: Popular Courses with Students

As listed earlier, students have the opportunity to study a variety of courses from different domains. Some of the popular courses taken by previous year students are as following (in no specific order)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ISyE 415</td>
<td>Introduction to Manufacturing Systems, Design and Analysis</td>
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<tr>
<td>ISyE 605</td>
<td>Computer-Integrated Manufacturing</td>
</tr>
<tr>
<td>ME 417</td>
<td>Transport Phenomenon to Polymer Processing</td>
</tr>
<tr>
<td>ME 429</td>
<td>Metal Cutting</td>
</tr>
<tr>
<td>ME 437</td>
<td>Advanced Material Selection</td>
</tr>
<tr>
<td>ME 514</td>
<td>Additive Manufacturing</td>
</tr>
<tr>
<td>MS&amp;E 461</td>
<td>Advanced Metal Casting</td>
</tr>
<tr>
<td>ME 418</td>
<td>Engineering Design with Polymers</td>
</tr>
<tr>
<td>ME 549</td>
<td>Product Design</td>
</tr>
<tr>
<td>MKTG 427/727</td>
<td>Enterprise Systems and Supply Chain Management</td>
</tr>
<tr>
<td>OTM 860</td>
<td>Sustainable design of innovative products, services and systems</td>
</tr>
<tr>
<td>ISyE/ME 412</td>
<td>Fundamentals of Industrial Data Analytics</td>
</tr>
<tr>
<td>ISyE/ME 510</td>
<td>Facilities Planning</td>
</tr>
<tr>
<td>ISyE/ME 512</td>
<td>Inspection, Quality Control and Reliability</td>
</tr>
<tr>
<td>ISyE 515</td>
<td>Engineering Management of Continuous Process Improvement</td>
</tr>
<tr>
<td>ISyE 516</td>
<td>Introduction to Decision Analysis</td>
</tr>
<tr>
<td>ISyE 524</td>
<td>Introduction to Optimization</td>
</tr>
<tr>
<td>ISyE 575</td>
<td>Introduction to Quality Engineering</td>
</tr>
<tr>
<td>ISyE 620</td>
<td>Simulation Modeling &amp; Analysis</td>
</tr>
<tr>
<td>ISyE 645</td>
<td>Engineering Models for Supply Chains</td>
</tr>
<tr>
<td>OTM 654</td>
<td>Production Planning and Control</td>
</tr>
<tr>
<td>ACCT IS 710</td>
<td>Managerial Accounting</td>
</tr>
<tr>
<td>MHR 722</td>
<td>Entrepreneurial Management</td>
</tr>
<tr>
<td>MKTG 421</td>
<td>Fundamentals of Supply Chain Management</td>
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<tr>
<td>MKTG/OTM 724</td>
<td>Strategic Global Sourcing</td>
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<tr>
<td>MKTG 422/722</td>
<td>Logistics Management</td>
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<tr>
<td>OTM 365/765</td>
<td>Database Concepts for Operations Management</td>
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<tr>
<td>OTM 714</td>
<td>Supply Chain Analytics</td>
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<tr>
<td>MHR 723</td>
<td>Business Strategy</td>
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