Same Quality, New Name

Congratulations on taking the next decisive step to advance your career as you consider joining the Master of Engineering Management program!

As you might have heard, we officially changed our name this summer from the Master of Engineering in Professional Practice to the Master of Engineering in Engineering Management. This change, prompted by feedback from program alumni and industry, better communicates the goals and impact of the degree.

Our program remains the same in quality, value, and impact, but we believe this new title will better reflect the program’s goals and curriculum. The University of Wisconsin–Madison Graduate School overwhelmingly supported this change and also praised the program’s outstanding example of continued excellence.

In addition to a new name, the program expanded its curriculum to include courses in negotiation, engineering law, and creativity—topics added based on feedback from alumni and industry.

Take a look at the information inside this brochure to learn why our program continues to be internationally recognized for its exceptional quality, impact, and value.

Wayne Pferdehirt, PE
Master of Engineering Management Program Director

Legacy of Success

The Master of Engineering Management program was established in 1998 as the University of Wisconsin–Madison’s first online degree program and set the school’s high standards for online education. Over the last 15 years, the program has graduated more than 400 engineers in positions ranging from project manager to CEO. These alumni are integral to the success of the program, from providing feedback to helping shape the program’s future.

The Master of Engineering Management also has received several national and international awards for its highly-innovative, collaborative approach to online education—including UW–Madison being ranked No. 3 for graduate online engineering master’s programs by U.S. News & World Report. The program is consistently benchmarked by peer universities as setting the bar in providing high-impact, engaging, applications-focused learning for experienced engineers.

Why a Master’s in Engineering Management?

The Master in Engineering Management is a two-year graduate engineering program for experienced engineers from all disciplines. It provides the tools and capabilities to become more effective engineering leaders.

This world-class degree program uses online project-based learning. Coupled with a supportive, integrated group of students and faculty, this method allows you to actively learn competitive, practical skills from anywhere around the world.

Gain skills for your career with a structure designed to fit your life.

The Master of Engineering Management program is tailored for busy working professionals like you, featuring:

- An online platform accessible to you from anywhere in the world
- Highly collaborative learning with peers from other world-class engineering organizations
- Flexible learning times
- Courses that apply immediately to real-world work
- A supportive structure that keeps you on track

Continued Improvements

This year, the program curriculum is expanding from 26 to 30 credits as part of the Graduate School reaccreditation. This is creating the opportunity to add important courses in:

- Effective Negotiation Principles and Strategies
- Key Legal Concepts for Engineers and Technical Professionals
- Foundations of Engineering Leadership
- Creating Breakthrough Innovations

Alumni and employers have identified these areas as critical to future engineering education.
Become a Leader in Your Industry

The Master of Engineering Management is a Master of Engineering degree, and as such, all courses are designed to address the needs and challenges faced every day by practicing engineers. The program meets the specific needs of engineers who are taking on increased management and leadership roles in the world of engineering.

You will gain results-focused proficiency in:
- Organizational leadership
- Project management
- Business strategy and operations
- Data-supported analyses and decision making
- Computer-based problem solving
- Quality management
- Persuasive communications
- International engineering practices

The Master in Engineering Management degree equips you with skills to:
- Lead global, networked teams
- Oversee product and process improvements
- Provide strategic, “big picture” analyses
- Tackle global competition and partnerships
- Lead confidently and competently as you develop and refine your personal leadership strategy
- Effectively communicate new ideas and information to all levels of an organization

Integrate Learning with Job Responsibilities

The program provides you with knowledge that you can apply immediately. Courses are problem-based and application-oriented with opportunities to use real project from your work for assignments.

Master of Engineering Management students see real results:
- 96 percent of students who enroll in the Master of Engineering Management program successfully graduate. This graduation rate is better than most on-campus graduate programs and far exceeds most online degree programs. Cohort-based learning with strong support from faculty enables student success.
- 95 percent of Master in Engineering Management graduates report a considerable or extensive positive impact on their professional development and careers
- More than 60 percent of program students obtained a promotion or salary increase before graduation, according to recent surveys of graduating students

As Compared to an MBA

For most mid-career engineers, the Master in Engineering Management is a better investment than an MBA. While you learn many of the same core concepts as an MBA student, all of your courses will be focused on the engineering field from the beginning. You will gain both breadth of perspective and depth within the field of engineering.

<table>
<thead>
<tr>
<th>Core MBA Courses</th>
<th>Master in Engineering Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting/Economics/Finance</td>
<td>Engineering Economic Analysis and Management</td>
</tr>
<tr>
<td>Business Strategy</td>
<td>Creating Breakthrough Innovations Effective Negotiation Principles and Strategies</td>
</tr>
<tr>
<td>Personnel Management</td>
<td>Applied Leadership and Management of Engineering Organizations</td>
</tr>
<tr>
<td>Project Management</td>
<td>Foundations of Engineering Leadership</td>
</tr>
<tr>
<td>Marketing</td>
<td>Technical Project Management</td>
</tr>
<tr>
<td>Operations Management</td>
<td>Communicating Technical Information</td>
</tr>
<tr>
<td>Statistics</td>
<td>Engineering Applications of Statistics</td>
</tr>
<tr>
<td>Technology and Information Systems</td>
<td>Engineering Problem Solving with Computers</td>
</tr>
<tr>
<td>Business Law</td>
<td>Key Legal Concepts for Engineers and Technical Professionals</td>
</tr>
<tr>
<td></td>
<td>Independent Reading and Research</td>
</tr>
<tr>
<td></td>
<td>Network Skills for Remote Leaners</td>
</tr>
</tbody>
</table>
Build Your Professional Network with Other Engineers from Top Firms

The Master of Engineering Management is far different from other online programs. Unlike many online degree programs, which stream lectures and digital information to students without significant and meaningful interaction with faculty and fellow students, UW–Madison’s Engineering Management program is designed for highly interactive, collaborative learning with peer professionals. You will proceed through your two years in the program with the same “cohort.” This group is limited to you and 29 other experienced engineers from top organizations around the world. Students consistently say the faculty teaching in the Engineering Management program are far more accessible and responsive than instructors that students have experienced in other on-campus or online programs.

The Master of Engineering Management program emphasizes group projects, which means you will be constantly interacting with your colleagues via online tools like web conferencing, online discussion forums, email, and conference calls. Problem-based assignments are structured to draw out and engage the extensive expertise of fellow students as part of the learning experience.

Master of Engineering Management students and alumni consistently note the cohort model as the key to their success in the program. Many say they built stronger relationships in the Master of Engineering Management program than they did during their on-campus days as an undergraduate. UW Engineering Management alumni have a strong network that continues to help each other grow and advance their careers.

How it Works

Like today’s global, networked work environment, the Master of Engineering Management program relies on online collaboration and meeting tools, as well as the one-week summer residency on the UW–Madison campus.

Online

With interactive tools, online web conferencing, and more, the Master in Engineering Management program focuses on close collaboration between instructors and students and among students. This unique model also provides students with experience in best practices in virtual teamwork and collaboration—crucial skills in an increasingly global economy. On a weekly basis, you may present to your entire class and your instructor as part of your regularly scheduled course web conferences, discuss that week’s topic on the class’s online forum, and convene via conference call for a group project.

In Person

Unique to UW–Madison’s Master of Engineering Management, each summer you will meet with your fellow students and instructors in a weeklong residency on the UW–Madison campus. Scheduled for August, these on-campus sessions will conclude the summer coursework and lead you into your fall courses. During residency, you will meet your classmates and instructors face-to-face, while you dive into intensive coursework and group project work that corresponds with your summer semester course. The program also brings in expert speakers—engineers with extensive experience and success in their industry. This face-to-face time builds and strengthens your ability to work effectively with fellow students via distance the rest of the year.

Being a Badger

Though you will only visit the UW–Madison campus briefly each summer, you will enjoy full status as a graduate student of the university, with benefits including:

- Student pricing on products such as computer software
- Online access to tethered software supported by the College of Engineering
- Eligibility for student tickets to UW Badger sporting events in Madison or for away games
- Access to the UW–Madison recreational sport facilities when in Madison, including the University Ridge golf course
- Access to student support services
- Access to extensive publications and databases available from the UW–Madison academic libraries, with special support from program-dedicated library specialists.

During your summer residency, you’ll have plenty of time in the evenings to explore the beautiful UW–Madison campus and surrounding city, including the State Street pedestrian mall, Camp Randall, the State Capitol building, and the Memorial Union Terrace overlooking Lake Mendota.
Selectivity in Admission

The Master in Engineering Management program is highly exclusive with each application closely reviewed by the admission committee. Only 30 of the best candidates each year are admitted. This small cohort of exceptional candidates, all of whom are practicing engineers, ensures that you will be working with peers whose experience will serve as an additional learning resource.

Top-Ranked by U.S. News & World Report

The University of Wisconsin–Madison ranks No. 3 among schools offering high-quality online graduate engineering programs by U.S. News & World Report. This is the third year in a row UW–Madison has ranked in the top ten.

To achieve this recognition, UW–Madison’s programs were required to meet the rigorous standards for quality education in the areas of faculty credentials and training, student services and technology, student engagement, and admissions selectivity.

An Award-Winning Program

The Master in Engineering Management program also has won major awards that recognize the exceptional quality of the program, from top organizations, including:

- United States Distance Learning Association (USDLA)
- American Distance Education Consortium
- Sloan Consortium
- University Continuing Education Association (UCEA)

Top Organizations Support the Master of Engineering Management Program

Every year, the Master of Engineering Management program has admitted students from some of the top companies in the world. The organizations listed below benefit every day from the knowledge and skills their students and alumni have brought to the table.

3M
Abbott Labs
Affiliated Engineers
American Electric Power
Arriyadh Development Authority
AT&T
Avtron Aerospace
BAE Systems
Baxter Healthcare
Birdsye Foods
Boeing
Carrier
Case New Holland
Caterpillar
Cingular Wireless
Cirrus Logic
CN Railroad
Cummins
Danfoss
Fairbanks Morse
Federal Express
FermiLab
Genentech
GE
General Mills
General Motors
Google
Gulfstream Aerospace
Harley-Davidson
Hewlett-Packard
IBM
Indian Health Service
Intel
John Deere
Kellogg
Kimberly-Clark
Kohler
Kraft
Lockheed Martin
Mantowoc Cranes
Medtronic
Mercury Marine
Monsanto
Motorola
NASA
Navistar

Ocean Spray
Oshkosh Trucks
P & H Mining
Parker Hannifin
Plexus Corp.
Qualcomm
Red Hat Software
Rockwell Automation
Sanofi Pasteur
Silgan Containers
Skullcandy
TDS
Trane
UL Labs
US Bureau of Indian Affairs
US Department of Defense
US National Security Agency
US Nuclear Regulatory Commission
UTC Aerospace Systems
Several municipal governments

The UW–Madison College of Engineering is among the nation’s top colleges of engineering. The college is home to 44 research centers and 21 research consortia, which collaborate directly with industry and government to identify and solve key engineering challenges.

Home of the Master of Engineering Management program, the Department of Engineering Professional Development annually delivers more than 300 continuing education courses in engineering, design, operations, production, maintenance, management, and planning to more than 11,000 students. In addition to the Master of Engineering Management, the department offers seven related online degree programs. Each of these degree programs is designed to meet the needs of practicing engineers in its curriculum and format.

epd.wisc.edu/engineeringmanagement
Real-life Student Success

**Geoffrey M. Goll, PE**  
Vice President  
Princeton Hydro  
Class of 2013

**Corey Chonsky**  
Reactor Mechanical Division Officer  
US Navy  
Class of 2014

**Explain why and how the program fit your life.**

**GG:** The curriculum is adaptable to every engineering discipline and industry area so each student can tailor the program to their particular field. The regularly scheduled classes were held at two separate times to allow for different family and work schedules. The user-friendly online interface is well organized and can be accessed anytime, anywhere.

**CC:** The two-year program fit nicely into my current position. It was nice having the flexibility to participate in classes either in the morning on Wednesday or during the evening on Thursday. Additionally, the professors were very understanding and flexible with courses when there were conflicts with either work or family life.

**Besides an advanced degree, what did the program leave you with?**

**GG:** The program left me with an understanding of current trends in management and quality control, the tools to make educated business and project management decisions, and the foundation for being a better leader.

**CC:** There were many things that I gained by being a part of the program, but I would say that the biggest thing that I gained, besides my master's degree, was the different leadership perspectives presented throughout the program. I have been in the Navy for more than 15 years and as you can imagine you can get set in your ways on how you might approach different leadership situations. Being exposed to different perspectives either through the other students in the cohort or through different courses throughout the two years allowed me think outside the box on issues and come up with unique solutions to problems.

**What is the most important thing someone should know when considering applying to this program?**

**GG:** It is important to understand that you will be working in a cohort environment and remain with this same group throughout the program. This provides a feeling of belonging and allows you to develop relationships that support you during demanding times. The entire faculty is dedicated to ensuring that you succeed in this program and make themselves available for individualized help as well. The program is designed for the success of each and every student.

**CC:** The most important thing that someone should know when considering the program is that there is going to be a significant time commitment on their part in order to successfully complete the program. This provides a feeling of belonging and allows you to develop relationships that support you during demanding times. The entire faculty is dedicated to ensuring that you succeed in this program and make themselves available for individualized help as well. The program is designed for the success of each and every student.

**How has the UW Engineering Management program made a difference in your career?**

**GG:** The program provided me with insight into management and leadership theory that I simply did not learn as an engineering undergraduate. It provided me with the ability to interpret and analyze corporate financial data, develop continuous improvement programs at my firm, develop methods to manage and track projects, and develop as a leader, not just a manager.

**CC:** The program has had a great effect on how I approach my current leadership position and how others viewed me at my organization. Additionally, many of the course lessons and assignments applied at work the following day, which brought a fresh perspective to how my organization was conducting business.

epd.wisc.edu/engineeringmanagement
Degree Requirements

Getting a Degree Requires Real Work

Designed for your success, the results-oriented Master of Engineering Management program constitutes a serious graduate-level workload. This is a program designed for engineers serious about growing new knowledge and abilities, rather than just adding a degree to their resume. The program requires 30 credits of graduate-level courses, obtained by completing 12 courses designed just for Engineering Management students. With the exception of summer sessions, you will take two courses each semester. You can expect to spend about 20 hours each week doing coursework and participating in group activities.

Financial Aid Available

Student loans are available for this program. All students who are US citizens or permanent residents are eligible to receive some level of funding from the federal Stafford loan program. These loans are available to qualified graduate students taking at least four credits during fall and spring, and two credits during summer. Visit the University of Wisconsin–Madison Office of Financial Aid at finaid.wisc.edu to learn more.

Admission Requirements

Admission requirements for the Master of Engineering Management program are listed below. Exceptions to standard admission requirements are considered by the admissions committee on an individual basis.

- A BS degree from a program accredited by the Accreditation Board for Engineering and Technology (ABET) or the equivalent.*

- A minimum of four years’ post baccalaureate engineering experience.

- A minimum undergraduate grade-point average (GPA) of 3.00 overall or for the equivalent of the last 60 semester hours (approximately two years of work) or a master’s degree with a minimum cumulative GPA of 3.00. Applicants from an international institution must have a strong academic performance comparable to a 3.00 for an undergraduate or master’s degree. All GPAs are based on a 4.00 scale. We use your institution’s grading scale; do not convert your grades to a 4.00 scale.

- Applicants whose native language is not English must provide scores from the Test of English as a Foreign Language (TOEFL). The minimum acceptable score on the TOEFL is 580 on the written version, 243 on the computer version, or 92 on the Internet version.

- International applicants must have a degree comparable to an approved U.S. bachelor’s degree.

We do not require applicants to submit scores from the Graduate Record Examination (GRE).

Applicants are not required to submit standardized test scores such as the GRE or GMAT. However, applicants may include the information in the online application to supplement their application.

*Equivalency to an ABET accredited program: Applicants who do not have bachelor’s degree from an ABET accredited program may also qualify for admission to the program. Such applicants must have a BS in science, technology, or a related field with sufficient coursework and professional experience to demonstrate proficiency in engineering practice. Registration as a professional engineer by examination, if achieved, should be documented to support your application.

Exceptions

Exceptions to the admissions requirements listed are made on a case-by-case basis. If you’re considering this program but are unsure that you meet the eligibility requirements, forward your resume to the Director of Student Services at managementapply@epd.engr.wisc.edu.

You will be provided with feedback on your eligibility and how to build the strongest application possible.

Phone: 866-529-6377 Email: managementapply@epd.engr.wisc.edu

“I am more willing to address business process issues and take initiative on new and different projects. I also have more knowledge in other disciplines that I work with such as project management; therefore, I have become a better project team member.”

Brianna Krech, Senior Systems Engineer, Motorola Solutions, Class of 2011 on how the engineering management program made a difference in her career.

epd.wisc.edu/engineeringmanagement
Tuition Reimbursement Programs through Your Employer

Many students work for companies that limit tuition reimbursement to a set amount each year. Please note that although the program is completed in four semesters and two summer sessions, this activity is actually spread out over three calendar years.

Tuition and Fees

For the most current tuition and fees information, please visit epd.wisc.edu/engineeringmanagement.

The program fees listed include tuition, web access to courses, summer residency registration, toll-free access to web conferencing, and full access to UW–Madison library resources.

Application Deadline

March 31…but apply early; space is limited!

The Admissions Committee accepts applications year-round. Applicants may submit application materials starting October 1.

Admission decisions are made from October 1 until March 31, or until all 30 spots in the incoming class are filled, whichever occurs first.

Applications are considered in the order received. It is in your best interest to submit materials well in advance of the deadline.

How to Apply

1. Email the Director of Student Services at managementapply@epd.engr.wisc.edu. In your email, state your intent to apply for admission and attach your current resume or CV, ensuring it contains:
   - Educational history, including: GPA, awards, and honors received
   - Professional work experience, including: specific details on your engineering experience, technical training, and responsibilities
   - Listing of professional associations/memberships, advanced training (such as a PE license), and other noteworthy, engineering-related details

2. Download the application checklist at management.engr.wisc.edu/checklist. This checklist outlines the materials you must submit to the Master of Engineering Management Admissions Committee and the UW–Madison Graduate School.

Get Started Now

Find admission requirements and begin the application process at: epd.wisc.edu/engineeringmanagement

For questions about the Master of Engineering Management program design and curriculum, contact:
Wayne Pferdehirt, Program Director
866-529-6377 or 608-265-2361
wayne.pferdehirt@wisc.edu

For questions about the application process, tuition, admission requirements, accommodations for disabilities, and financial aid, contact:
Shainah Greene
Graduate Programs Coordinator
866-529-6377 or 608-262-0468
shainah.greene@wisc.edu
### Year I: Summer

#### Network Skills for Remote Learners

1 credit

**Instructors:** Tom Smith and Mark Millard

Learning and working online requires that you master the tools and techniques of personal information management, communication, and collaboration. This course will improve your efficiency and effectiveness in these areas for both work and learning. You will also take time to examine your own educational goals and develop a learning strategy and schedule to maximize the benefits you receive from the Master of Engineering Management program.

**Course Topics**

**Setting Up Your Learning Environment**
- Introduction to your online learning environment
- Installing, updating, and testing required software
- Troubleshooting your network, tools, and applications
- Addressing security at home, work, and on the road

**Learning at a Distance**
- Mastering online discussion forums, wikis, and conference environments
- Succeeding as a distance learner
- Juggling roles, responsibilities, and time
- Making your life mission happen

**Managing Information**
- Strategies for e-mail effectiveness and file management
- Leadership responsibilities for information management
- Conducting professional web and library searches

**Desktop Skills and Teamwork**
- Sharing data among applications
- Working in a virtual team
- Delivering online presentations

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#### Foundations of Engineering Leadership

1 credit

Build the foundations for developing, refining and strengthening your effectiveness as a leader of engineering teams, projects, and organizations. Enhance your understanding of how to match your leadership style to a team's focus, organization and culture. Grow your understanding of your strengths and weaknesses as a leader using proven assessment tools. Develop your plan for growing your leadership competency through the rest of the Master of Engineering Management program and beyond.

**Course Topics**

- Key elements of effective leadership and leaders
- Differentiating leadership and management
- Comparative study of theories and philosophies of leadership
- Leadership within engineering and technical organizations
- Assessment of your style and behavior attributes
- Acknowledging your impediments to effectiveness as a leader
- Adapting your leadership style to the culture of a team/organization
- Definition and development of your own leadership focus, philosophy, and style
- Development of your personal plan for leadership development
  - goals and projects within Master of Engineering Management courses
  - within your organization
  - broader life and career opportunities

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#### Engineering Economic Analysis and Management

3 credits

**Instructor:** Charles Krueger

Learn principles and practices of interpreting financial information and performing engineering-related economic analyses. This course focuses on current practices, using economic information for decision-making, and control.

**Course Topics**

**Financial Principles**
- Implications of accounting and cost systems to engineers
- Interpretation of financial data, budgets, and accounting summaries

**Costing Systems and Management Control**
- Activity-based costing
- Pricing strategies and decision making
- Cost analysis and models
- Budgeting and risk analysis

**Investment Analysis**
- Time value of money
- Discounted cash flow, internal rate of return, and payback methods
- Sensitivity and break-even analysis
- Impact of depreciation and income tax

**Financial Models and Forecasts**
- Planning and control models
- Contemporary financial management techniques
Year I: Fall

Technical Project Management
3 credits

Instructors: Jeffrey Russell, Wayne Pferdehirt, and John Nelson

This highly practice-focused course enables project managers at all levels, from first-time rookies to highly seasoned pros, improve their strategies, methods, and results. Learn latest proven methods to successfully plan, schedule, budget, and complete projects. Using a real project from your own work, you and several team members will apply methods and tools to improve the organization and management of your selected project. The course examines how traditional project management methods can be improved through incorporation of lean principles and agile methods.

Course Topics

Project Management Foundations
- Developing a dynamic and adaptive approach to project management
- Reliable promising as a key enabling strategy and practice
- Principles of lean management

Strategic Evaluation and Selection of Projects
- Effective portfolio management
- Metrics and methods for evaluating candidate projects

Project Initiation, Scope, and Structure
- Defining project value and measures of success
- Developing an effective project charter

Proposals and Contracts
- Principles of effective partnership
- Contracting methods and terms

Team Formation, Team Management and Project Leadership
- Leadership principles
- Team dynamics

Project Planning
- Developing an appropriate project strategy
- Incorporating lean principles
- Agile project management

Project Scheduling
- Critical path analysis
- Managing schedule slack

Managing Project Risks
- Identifying critical project risks
- Strategies for managing risks

Managing Project Value, Budgets and Costs
- Top-down, bottom-up, and iterative methods of establishing project budgets and their relative advantages
- Identifying and managing budget uncertainty
- Communicating and managing the project budget

Allocating and Managing Constrained Resources
- Identifying and managing project critical resources
- Allocating resources among several projects

Project Monitoring and Control
- Developing a project neural network: connecting the nerves with the muscles
- Earned value analysis
- Development of corrective plans

Current and Evolving Project Management Topics
- Exploration of key issues and challenges faced by current projects and their teams
- Example: project challenges, constraints and opportunities related to sustainability

Improving Project Performance through Audits and Closures
- Mid-project assessment of performance, corrections, and continued viability
- Best practices for wrapping up a project and capturing lessons learned

Growing Your Organization’s Project Management Abilities
- Develop your ability and vision to lead the advancement of appropriate project management strategies and practices in your workplace

Year I: Spring

Communicating Technical Information
3 credits

Instructors: Christine Nicometo and Traci Nathans-Kelly

This course focuses on strategic communication skills for technical leadership. The course addresses effective communication strategies, audience analysis, and techniques that contribute to successful gathering, synthesizing, writing, and presenting technical information. Along with assignments that support an on-the-job written project, the course incorporates weekly web conferences, discussion forums, readings, and research technique training workshops supported by UW's library specialists.

Course Topics

Audience Analysis
- Applying strategies for technical, non-technical, and mixed audiences

Persuasion Strategies
- Using rhetorical techniques that persuade audiences, readers, project teams, and management

Technical and Work Communication
- Creating electronic communication, written communication, presentations; using proper style, tone, grammar, diplomacy, documentation practices, archival practices; working with international teams or clients

Major Communication Projects
- Developing technical proposals, technical reports and related documents, technical presentations

Research
- Working efficiently and thoroughly with library, databases, web resources; pursuing lifelong learning
Year I: Spring

Engineering Problem Solving with Computers

3 credits

Instructor: Jake Blanchard

This course helps you develop the skills necessary to more efficiently solve the increasingly complex problems facing engineers today. Learn underlying principles and master techniques to utilize a number of tools with powerful capabilities. A case study approach ensures the practicality and applicability of the techniques covered.

In attacking these case studies, you will learn techniques for solving linear and nonlinear systems, optimization techniques, and approaches to solving systems of differential equations that govern many engineering problems.

The tools used during the course include MATLAB and Excel.

As part of this course you will select and complete a project in which you apply course tools and concepts to a workplace need.

Course Topics

Systems of Algebraic Equations
  • Linear systems
  • Non-linear systems

Optimization
  • Single and multivariate techniques

Differential Equations
  • Runge-Kutta techniques
  • Finite difference approaches

Miscellaneous
  • Numerical integration
  • Data analysis
  • Databases
  • Monte Carlo techniques

Year II: Summer

Independent Reading and Research in Applied Engineering

2 credits

Instructors: Philip O’Leary and Christine Nicometo

This summer course provides an opportunity to do independent reading and research in a field of your choice under the guidance of a UW faculty member or an appropriate advisor. Often, new tools, concepts, or strategies learned during the first year of the Master of Engineering Management program spark interest in exploring further applications of ideas. This independent study course is an excellent opportunity for focused, personalized reading and research that can benefit your career.

In the spring semester, you will determine your research question in order to facilitate advisor matching. Then, during this summer course, you will use a variety of in-depth research techniques and complete four main project steps: 1) project proposal with a research plan, 2) literature review, 3) project draft, and 4) final report. Several web conferences during the summer will cover project definition and scope, research updates, and preliminary project results. You also are encouraged to work informally in small group review teams within your cohort. Finally, throughout the process, you will receive advice and feedback from the course instructors and from your advisor.

Your research deliverables are a graduate level report plus a technical presentation during the year-two summer residency in Madison. You may want to use the report at a conference or at work or publish it in a journal.

Course Topics

• Tracking down variation, descriptive statistics, and statistical software
• Probability distributions, sample size effects, and confidence intervals
• Comparing two means
• Design of experiments I, II, III
• Measurement capability, variance components, and gage R&R
• Regression analysis I, II
• Other types of data: skewness, proportions, and counts
• Miscellaneous: process capability metrics, data transformation, response surface methodology, survey data, and cross-tabulated data
• Project preparation and presentations

Year II: Fall

Engineering Applications of Statistics

3 credits

Instructor: Conrad Fung

Most engineering decisions rely on numbers. But numbers in turn can be subject to variation, uncertainty, drift, bias, interpretation, context, unstated assumptions, and hidden agendas. The job of statistics is to find as much underlying truth as the numbers can reveal and to determine how much uncertainty remains. This course teaches you strategies for managing the uncertainty that exists in all numbers to ensure that your decisions will be informed ones. In the course, you will examine the structure of variation and learn the core descriptive methods for characterizing and comparing populations. You will also learn the more active tools of experimental design. As a final project you will design and execute a physical experiment and present the results. You will use the MINITAB statistical package to carry out most of the analyses in the course.

Course Topics

• Tracking down variation, descriptive statistics, and statistical software
• Probability distributions, sample size effects, and confidence intervals
• Comparing two means
• Design of experiments I, II, III
• Measurement capability, variance components, and gage R&R
• Regression analysis I, II
• Other types of data: skewness, proportions, and counts
• Miscellaneous: process capability metrics, data transformation, response surface methodology, survey data, and cross-tabulated data
• Project preparation and presentations
Year II: Fall
International Engineering Strategies and Operations
3 credits
Instructor: Don Schramm
Learn to work better globally through a comparative examination and analysis of global trends and regional variations of engineering concepts, standards, and practices. Using organizational (public and private sector) case studies, this course describes and analyzes multi-national and national engineering operations, summarizing best practices and caveats. Comparative regional and national engineering professional practice procedures and methods are explored from Africa, Asia, Europe, Latin America, the Middle East, and the Pacific Basin.

Course Topics
International Engineering Systems
- What exists today; plans for tomorrow
- Organizations: national and multinational
- Country briefings

Engineering Professional Practice
- Consultant versus corporate
- Engineering norms and standards
- Engineering codes and procedures
- International engineering journals

Engineering Operations
- Office and desktop procedures
- Field and on-site work
- Professional and personal approaches
- Possible adaptations or modifications

Working Across Cultures
- National and regional cultures
- Business and corporate cultures
- Languages, verbal and nonverbal
- Analysis techniques from Trompenaars and Hofstede

Special Concerns
- Economic and legal
- Social and political
- Strategies, structures, and people
- Working in virtual teams

Year II: Spring
Applied Leadership and Management of Engineering Organizations
3 credits
Instructor: Christopher Dakes
Explore strategies, models, and practices for leading and managing engineering organizations in a context directly relevant to you. You will engage in self-reflection about your styles, beliefs, and past experiences with leadership and management, and emerge with an insightful understanding of your personal approach as a professional.
A course project of direct relevance to you and your organization will help you integrate theory, models, case studies, and real-time experiences from your workplace. You will leave the course with broad exposure to diverse approaches to leadership and management, and a deeper understanding of how to put what you learn into action.

Course Topics
Traditional and contemporary models of leadership and management
Organizational culture and qualities of successful engineering organizations
Motivation and the meaning of work
Employee engagement and development
Group dynamics and leading teams
Emotional intelligence
Organizational change and overcoming obstacles
Building and advancing the business case for projects, products, and services
Building systems and practices that sustain excellence within an engineering organization

Year II: Spring
Quality Engineering and Quality Management
3 credits
Instructor: Harold Steudel
Lead a team at your workplace through the improvement of a real-life process, product, or service. The course provides an opportunity to explore and apply modern quality concepts, tools, and techniques to develop, implement, and maintain systems for improving quality and productivity in your organizations. Use of quality management and planning tools will help you define quality problems and opportunities, implement measurable solutions, and foster team-based strategies for continuous improvement. The course also addresses issues in change management and how to successfully implement change in an organization.

Course Topics
Module One: Fundamentals of Quality Improvement
- Kaizen/Total Quality Management
- Concepts and principles
- Defining good process improvement projects and group processes
- Assessing organizational change readiness (OCM model)

Module Two: Management and Planning Tools
- Affinity diagrams and interrelationship digraphs
- Tree diagrams
- Prioritization matrices
- Project planning and management techniques

Module Three: Change Management
- Challenge and nature of organizational change
- Leading successful organizational change
- Training tools and practical issues

Module Four: Basic Statistical Techniques
- Statistical concepts for process control and assessment
- Statistical process control and process capability techniques

Module Five: Project Presentations
- Presentations, reviews, and final report
Creating Breakthrough Innovations
1 credit
Instructor: Rich Derks
Creativity and innovation are key engineering competencies identified by the National Science Foundation. These competencies are highly correlated with the creation of innovative products and services, sales growth, and business valuation.

This course will explore the best practices at such companies as 3M, Apple, Google, General Electric, and others. Students will learn a number of hands-on techniques for being more creative and practice these techniques through a work-related project. All students will receive electronic templates containing creativity tools to stimulate creative thought and innovation.

Course Topics
Organizational Environments
• Obstacles to organizational creativity
• Characteristics of creative organizations
• Breaking down the barriers to creativity

Individual Creativity
• Drivers of creative traits
• Adopting a creative attitude
• Practicing creativity and gaining confidence

Creativity Techniques
• Brainstorming
• Nominal group technique
• Metaphorical thinking and other techniques

Coaching and Leadership
• Interpersonal obstacles to creativity
• Motivating supervisors toward creative leadership
• Motivating team members to exhibit creativity and give their very best

Following a Creative Process
• Identifying purposes and measures of effectiveness
• Generating ideas
• Choosing the best ideas

Effective Negotiation Principles and Strategies
1 credit
Negotiation is a critical competency for engineers. Engineers are often involved in supplier, partner, and customer negotiations. In addition, strong negotiating skills can play a key role in obtaining internal resources and managing one’s career. Negotiating up and down within the organization are essential skills for effective work performance.

This course will examine some well-publicized negotiations, including corporate/government cases, corporate/labor cases, and corporate/corporate cases (e.g., Apple, Chrysler, Time-Warner, Starbucks). Students will learn effective negotiation strategies and apply these strategies through a work-related project. All students will receive electronic templates for planning and executing successful negotiations.

Course Topics
Participant Assessment
• Styles of negotiations
• Role of personalities in negotiations
• Influence of gender, race, culture

Preparing for the Negotiation
• Goal definition
• Expected outcomes
• Defining alternatives

Conducting the Negotiation
• Stating positions
• Reacting to the other side
• Roles on the negotiating team

Dealing with an Impasse
• Changes in players
• Creating new alternatives
• Leveraging time

Moving Forward After a Negotiation
• Reassuring players of results
• Communicating to external stakeholders
• Implementing the agreement

Key Legal Concepts for Engineers and Technical Professionals
1 credit
Engineers are increasingly being called upon to help protect corporate intellectual property and play a role in product liability suits. Patents, trademarks, copyright, trade secrets, and contracts often require the expertise of engineers.

This course will examine some well-publicized legal cases, which include companies such as General Motors, Microsoft, Motorola, and others. Students will learn a number of hands-on techniques for reviewing and preparing legal documents, and practice these techniques through a work-related project. All students will receive electronic templates for preparing patent and copyright applications, nondisclosure agreements, supplier agreements, and more.

Course Topics
Legal Contracts
• Defining business requirements
• Legal terms
• Termination, breach, remedies

Intellectual Property
• Design vs. utility patents
• Patent claims
• Deciding trade secrets vs. patent protection

Risk Management Planning
• Identifying what can go wrong
• Developing prevention plans
• Developing reactionary plans

Trademarks and Copyrights
• Global regulations
• Filing process
• Competition and protection

Product Liability
• Breaches of warranty
• Negligence and strict liability
• Consumer protection laws

Master of Engineering Management Curriculum
In addition to the above required courses, you must complete at least one of the following one-credit courses during a semester of your choice:
Master of Engineering Management Faculty

Jake Blanchard, PhD, is the Duane H. and Dorothy M. Bluemke Professor of Engineering Physics, chair of the Engineering Physics Department, and Interim Executive Dean of the College of Engineering at UW–Madison. He has published more than 75 articles on topics including fusion technology, solid mechanics, materials, and applied physics. A former recipient of the National Science Foundation’s Presidential Young Investigator Award, Blanchard received the UW Distinguished Teaching Award in 2002 and the Harvey Spangler Award for Technology Enhanced Instruction in 2008. He holds an MS in engineering and a PhD in nuclear engineering from UCLA.

Christopher G. Dakes, PhD, LEED AP, is a faculty associate in the College of Engineering at UW–Madison and the Director of Educational Innovations and Learning Design for the Wisconsin School of Business. His combined experience in academia, industry, international teaching, and consulting bring a strong blend of real world perspectives into the classroom. He has worked as the director of organizational development for an architectural engineering firm and as an organizational consultant for engineering and biotechnology firms. He has a PhD in Socio-technical Systems Engineering from UW–Madison and an MS in mechanical engineering from Penn State University.

Richard Derks, BSIE, MBA, CPIM, is program director in the Department of Engineering Professional Development at UW–Madison. He manages a series of courses on engineering leadership and new product development. He is also developing a series of for-credit professional competency courses that will be taught on-line. He holds multiple patents and has published more than 50 articles on leadership, strategy, and product innovation. Prior to UW–Madison, Derks spent more than 25 years in the private sector, with increasingly responsible positions in engineering, product management, logistics, information systems, operations, and marketing. Most recently, he was division president for a $6-billion medical device manufacturer.

Conrad Fung, PhD, is adjunct assistant professor at UW–Madison and a statistician in private practice. For over 25 years, he has consulted in a wide variety of industries. Previously, Fung worked as a statistician at the DuPont Company, implementing modern quality control at manufacturing plants in Europe and the United States. He has held joint appointments in the Department of Industrial Engineering and the Center for Quality and Productivity Improvement. Fung chaired the Statistics Division the American Society for Quality. He holds a PhD in statistics from UW–Madison.

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Master of Engineering Management Faculty

Charles Krueger, CPA, CGMA, CIA, is emeritus professor of management for the Wisconsin School of Business Executive Education at UW–Madison. He directed programs in accounting, finance business management, and related fields with a focus on helping managers use financial information for effective decision making. Now he maintains an active teaching schedule and private consulting practice. He also serves on the local board of the Institute of Management Accountants and is an active member of the Wisconsin and the American Institute of Certified Public Accountants, the Society of Insurance Trainers and Educators, and the Institute of Internal Auditors.

Mark Millard is Director of Learning Design and Technologies for the Department of Engineering Professional Development at UW–Madison. Mark has published articles and chapters on online education, educational innovation, and emerging technologies for learning and collaboration. He presents regularly at international conferences. Most recently, Open University of Catalonia in Barcelona, Spain, invited him as a visiting scholar. Previously, Millard was Assistant Director of the Office of Instructional Consulting in the School of Education at Indiana University. Millard holds an MS in information science from Indiana University.

Traci Nathans-Kelly, PhD, teaches technical and engineering communication at UW–Madison and Cornell University. She also works for Wiley-IEEE Press as the series editor for the “Engineering Professional Communication” line and as the IEEE Press Liaison for the IEEE Professional Communication Society. Nathans-Kelly was recently part of a National Science Foundation grant studying the alignment of engineering education with practice. She is a senior member of the Society for Technical Communications and received her PhD in English from University of North Dakota.

John Nelson, PE, is adjunct professor of civil and environmental engineering at UW–Madison and Managing Director for Global Infrastructure Asset Management LLC, an asset management firm specializing in sustainable infrastructure investments. Previously, Nelson was CEO of Affiliated Engineers. Under his leadership, the engineering firm became nationally recognized for designing dynamic building systems for large and complicated projects. His background includes design, applications, and research of dynamic building systems as well as management/technical consulting for the investment, design, manufacturing, and construction industries. Nelson received an MS in mechanical engineering from UW–Madison.
Christine G. Nicometo teaches technical communications to undergraduate and graduate students at UW–Madison. She has taught at Michigan Technological University, University of Minnesota (Iron Range Engineering), and Finlandia University. Nicometo’s research incorporates findings from cognitive research with best practices for technical presentations. Her book on technical presentations was published in 2014 by IEEE-Wiley. An active member of ASEE and IEEE, she also worked on a multi-year National Science Foundation study about how people learn engineering. Nicometo received her MS in Rhetoric and Technical Communication from Michigan Technological University.

Philip R. O’Leary, PhD, PE, is chair of the Department of Engineering Professional Development at UW–Madison, which administers the Master of Engineering Management degree. In addition he teaches professional development courses in solid waste management and related environmental topics. Prior to joining the university, O’Leary worked for the Wisconsin Department of Natural Resources where he developed guidelines and issued permits for industrial pollution control systems, land application of effluent systems, and the application of sludge on agricultural land. O’Leary earned BS and MS degrees in agricultural engineering and a PhD in land resources, all from UW–Madison.

Jeffrey Russell is an adjunct faculty member for the Wisconsin Certified Public Manager Program, Small Business Development Center, and School of Engineering. He also is co-director of Russell Consulting, Inc., which specializes in helping organizations achieve great performance while successfully responding to the challenges of continuous change. With a focus on leadership, strategic thinking, leading change, and performance coaching, Russell has worked internationally with a diverse range of organizations. He frequently presents at conferences and has co-authored nine books. Russell received his MA in Industrial Relations from UW-Madison.

Jeffrey S. Russell, PhD, PE, Dist.M.ASCE, NAC, F.NSPE, is Vice Provost for Lifelong Learning, Dean of Continuing Studies, Professor of Civil and Environmental Engineering, and co-founder of the Construction Engineering and Management program at UW–Madison. Over the last 25 years he has earned a reputation as a leader in lifelong learning, adult education, continuing education, engineering education, construction engineering and management, and civil engineering. Recipient of more than 20 national and regional awards and nine best paper awards, Russell has published over 250 technical papers and has authored or edited four books. He has a PhD in civil engineering from Purdue University.
Master of Engineering Management Faculty

Don Schramm, RA, is a faculty associate in the Department of Engineering Professional Development at UW–Madison. He also directs the UW-Disaster Management Center, which has offered international distance learning programs for 30 years. A registered architect in Wisconsin, he has worked in professional education for four decades throughout the United States and has lived and worked in some 50 countries worldwide, including one year teaching as a Fulbright professor at universities in Bogotá and Cali, Colombia. Schramm holds a B.Arch from the University of Illinois and an MSLA from UW–Madison.

Harold J. Steudel, PhD, PE, is the Emerson Electric Professor Emeritus in Total Quality in the Department of Industrial and Systems Engineering (ISyE) at UW–Madison. He teaches quality and productivity improvement courses. Steudel draws on over 35 years of experience in designing and implementing cutting-edge techniques to improve quality control, environmental, and manufacturing systems. He has developed assessment tools and training courses for Malcolm Baldrige, ISO 9001, QS 9000, ISO/TS 16949, and ISO 14001 international guidelines and standards. Steudel also served as a certified quality system lead auditor under the Registrar Accreditation Board.

Gary Henderson is the director of student services for UW–Madison’s Master of Engineering distance education programs. One of his roles is to address student concerns and seek helpful resolution when these conflict with academic performance. He also serves as an advocate for distance degree students across campus. Henderson chairs the Admissions Committees for Master of Engineering distance degree programs and is the point-of-contact for applicants and students. He holds an MA in counseling, social and organizational psychology and has completed advanced graduate studies in organizational behavior and strategy.

Thomas W. Smith is program director in the Department of Engineering Professional Development at UW–Madison. His research and teaching responsibilities focus on physical asset management. Smith was an U.S. delegate to the International Standards Organization (ISO) committee that developed the new ISO standard on asset management. He also is a member of the faculty of the Institute of Asset Management and is involved in competency model development and leadership training for a number of organizations. Smith received an MS in Urban Planning from UW–Madison and BS from Dartmouth College.

Wayne P. Pferdehirt, PE, is director of the Master of Engineering Management program and of graduate distance degree programs for the College of Engineering. Pferdehirt oversees the development and delivery of Master of Engineering Management courses and ensures that the program meets students’ needs. He also co-teaches the Technical Project Management course. Prior to joining UW–Madison, Pferdehirt directed the Midwest solid waste consulting services of an international environmental consulting firm, led energy conservation research projects for Argonne National Laboratory, and conducted floodplain management studies for the Army Corps of Engineers. Pferdehirt is a licensed professional engineer. He has an MS in civil engineering and regional planning from Northwestern University.

“The curriculum strengthened my core abilities to communicate across the engineering project spectrum and lead with much more credibility and confidence in my role."

Rudy Quiles, Civil Affairs Officer, United States Marine Corps, Class of 2009
Master of Engineering Management

world-class, top-ranked, online

“I have personally observed the impact of this program on three participants; in all cases, the personal growth in engineering problem-solving skills, business acumen, and self-confidence have been notable and professional success is certain.”

Cynthia Bachmann, Vice President, Engineering, Kohler Company, employer of graduates

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