Engineering Management

The newly revised Master of Engineering Management program bridges the gap between technology and business by providing students with the technical expertise and leadership skills needed to advance their careers. The 30-unit Master of Engineering Management is available for full-time or part-time students.

This program brings together Washington University faculty and industry-leading experts to help students learn to strategize, lead, make informed decisions, manage financials, and leverage both existing and emerging technology. The courses prepare individuals to utilize common management tactics across all of the engineering disciplines.

Email: sever@wustl.edu
Website: https://sever.wustl.edu/degree-programs/engineering/index.html

Faculty
Program Director
John Bade
Interim Director of Graduate Studies, Engineering Management and Project Management
PhD, Missouri University of Science & Technology
MBA, Saint Louis University
ME, Missouri University of Science & Technology

For a list of our program faculty (https://sever.wustl.edu/faculty/#engineering_management), please visit our website.

Requirements
Master of Engineering Management

Total units required: 30

In order to earn the degree/certificate, all courses must be passed with a C- or higher. In addition, a student must have a cumulative grade-point average of at least 2.70 over all courses applied toward the degree/certificate.

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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<tr>
<td>Required: 18 units</td>
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<tr>
<td>ETEM 504</td>
<td>Engineering Management &amp; Financial Intelligence</td>
<td>3</td>
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<tr>
<td>ETEM 506</td>
<td>Technology Strategy &amp; Marketing</td>
<td>3</td>
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<tr>
<td>ETEM 510</td>
<td>Understanding Emerging &amp; Disruptive Technologies</td>
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ETEM 582 Human Performance in the Organization 3
or ETEM 581 Leading in a Technology-Rich World 3
ETEM 585 MEM Capstone 3
PRJM 523 Project Planning Methodologies 3

Electives: Choose 12 units

Applied Data Analytics Emphasis
INFO 506 Fundamentals of Information Technology 3
INFO 574 Foundations of Analytics 3
INFO 575 Enterprise Data Management 3
INFO 576 Analytics Applications 3
INFO 577 Applied Data Science for Practitioners 3

Computer Science & Security Emphasis
CSE 501N Introduction to Computer Science 3
CSE 502N Data Structures and Algorithms 3
CYBER 559 Introduction to Cybersecurity 3
CYBER 560 Cybersecurity Technical Fundamentals 3
CYBER 567 The Hacker Mindset: Cyber Attack Fundamentals 3
CYBER 568 Emerging Issues and Technology in Cybersecurity 3
ETEM 505 Decision Analysis & Optimization 3

Managing, Leading & Innovating Emphasis
ETEM 520 Intro to Innovation & Entrepreneurship 3
ETEM 525 Innovating For Defense 3
ETEM 581 Leading in a Technology-Rich World 3
ETEM 582 Human Performance in the Organization 3
ETEM 586 Cross-Cultural Negotiation 3
ETEM 587 Communication Excellence for Influential Leadership 3
MGT 501C CEL Entrepreneurial Consulting Team 3

Project Management & Operational Excellence Emphasis
CNST 523A Construction Cost Estimating 3
CNST 572 Legal Aspects of Construction 3
CNST 573 Fundamentals in Construction Management 3
HLTHCARE 502 Facilitation Skills/Change Management 3
HLTHCARE 503 Lean Healthcare Concepts, Tools and Lean Management Systems 3
HLTHCARE 504 Six Sigma Concepts and Tools 3
PRJM 525 Introduction to Agile Project Management 3
Courses

Visit online course listings to view semester offerings for T55 ETEM (https://courses.wustl.edu/CourseInfo.aspx?sch=T&dept=T55&crslvl=5:8).

* Courses required to earn a 15-unit Graduate Certificate in Engineering Management.

T55 ETEM 504 Engineering Management & Financial Intelligence
Discover the full picture of how business works within the organization. This course walks the student through the complete business cycle -- the roles the various functions play in a business operation as well as how information is used to make business decisions (e.g. financial data, marketing data, production data, economic data). To bring these learnings to life, this course also uses management simulation games and classroom competitions. Includes strategy, product planning and management, sales and support, research and development, manufacturing and supply chain, with particular emphasis on accounting, finance and the use of financial statements.
Credit 3 units.

T55 ETEM 505 Decision Analysis & Optimization
Expand your ability to analyze and optimize complex business situations by leveraging the key data. Decision-making in today's complex world requires advanced analytical methods and tools, including mathematical modeling and quantitative techniques. Powerful tools for forecasting, finance, operations, production and logistics. Emerging technologies such as the Industrial Internet of Things (I-IoT) and Block Chain are enabling a whole new set of possibilities!
Credit 3 units.

T55 ETEM 506 Technology Strategy & Marketing
Learn the art and science of technology-rich strategy and marketing. Every business rises and falls on the value it brings to the customer and the value it simultaneously brings to the business itself. The engineer that understands and can communicate strategy and marketing is powerful! Business, technology and research budgets are allocated based on this value proposition, whether the commercialization or operationalization of the technology is 1 year out or 10 years out. Prerequisite: T55 504.
Credit 3 units.

T55 ETEM 510 Understanding Emerging & Disruptive Technologies
We live in an era of rapid technology innovation and disruption. Blockbuster was the darling of Wall Street in 2004 and filed for bankruptcy in 2010. Blockbuster CEO in 2007: "Neither Redbox nor Netflix are even on the radar screen in terms of competition." Blockbuster is not alone in their blindness. Microsoft laughed off the first i-phone, and laughed off Google. IBM laughed off the first personal computer. These should be a horrible warning to all business leaders. Numerous technologies are threatening disruption today: block chain, Internet of Things (IoT), artificial intelligence, autonomous vehicles, unmanned aerial vehicles (UAVs), 3D printing, 5G wireless networks, gene editing. Understanding what they are and how they might disrupt will make or break countless companies in the coming years.
Credit 3 units.

T55 ETEM 520 Intro to Innovation & Entrepreneurship
Where do good ideas come from? Can anyone learn to be innovative? What does an innovative organization look and act like? How does innovation help create breakthrough technology and launch powerful businesses? Innovation is a skillset and a mindset, and they can be learned. This course introduces important frameworks and concepts, and it offers the student hands-on learning experiences that foster growth in innovation, both for the individual as well as for the organization.
Credit 3 units.

T55 ETEM 525 Innovating For Defense
This interdisciplinary entrepreneurial course gives students the unique opportunity to solve real problems facing the U.S. Department of Defense (DoD) and the U.S. Intelligence Community (IC). This course is open to students from McKelvey School of Engineering and Olin Business School (in roughly equal proportions) who want to solve real problems for real customers in real time. Students will form their own interdisciplinary teams. Each team chooses their own DoD problems from those available to the class. Each problem has a dedicated DoD problem sponsor who will be regularly engaged with the team. Student teams learn and use the Lean Startup methodology and the Mission Model Canvas made famous by Stanford University to iteratively cut through the complexity of the problem. Teams develop a keen understanding of the problem, craft a business model and solution, and develop a prototype. Note: This course is sponsored by the U.S. DoD. It was originally developed at Stanford University and is now taught at 30+ U.S. universities. A student does NOT have to be a citizen of the United States to take this course; none of the DoD problems are classified. Recommended completion of T55 ETEM 520.
Credit 3 units.

T55 ETEM 581 Leading in a Technology-Rich World
Leadership has fundamentally changed from top-down, autocratic and task-focused to collaborative and people-focused in just a few generations. Great senior leaders now get their people to do the greatest things. They must constantly learn, think innovatively, move and adapt very quickly, and collaborate over short and long distances. Students will learn new leadership skills, explore their individual leadership styles, and discuss the senior leadership challenges in an evolving tech-rich world.
Credit 3 units.

T55 ETEM 582 Human Performance in the Organization
Have you ever wondered why some careers soar and others stall? Why do some people have problems communicating? Why do some cultures function well and consistently outperform others? Are you curious about what kind of manager you are, or will be? Do you want to know more about how organizations decide who to hire and who to promote? Human Performance in the Organization is designed to help you answer these questions. The content is a mix of relevant theory, personal reflection, and practical application.
Our goal is to understand human performance at all levels of the organization. Topics include performance and career management; negotiation and influence; power and politics; mentoring and coaching; high-performance teams; conflict management; talent development and succession planning; and change management.
Credit 3 units.

T55 ETEM 585 MEM Capstone
The MEM capstone course is the culmination of the Master of Engineering Management degree program. Taken at the end of the program, the capstone course gives each student (as part of a team) an opportunity to apply a cross-section of knowledge and skills gained toward a current challenge/ project from industry, government or nonprofit organization. Student teams are encouraged to interface with the sponsoring organization throughout the semester. Prerequisite: Completion or co-enrollment in all Required MEM courses.
Credit 3 units.

T55 ETEM 586 Cross-Cultural Negotiation
This course introduces students to and gives them practice with principle-based tools and techniques to reach agreements across varied cultures. Best practices from the most famous negotiators of ancient history (i.e., the Phoenicians) are studied and used as a methodology that includes the role of a third party in resolving conflict. The cross-cultural elements are based on multicultural experiences, research studies and the real-life experiences of the instructor. The course is highly interactive (about 70% of the course work). Participants learn through role plays and simulation as well as through readings and case-study analysis.
Credit 3 units.

T55 ETEM 587 Communication Excellence for Influential Leadership
Exceptional communicators become extraordinary leaders. This course will guide students to learn to exceptionally communicate their message by applying refined nuances that inspire and transform those with whom they converse. Through a proven communicative process, students will acquire skills necessary to differentiate them as leaders. Students will learn how to communicate across a variety of settings using strategies that result in clear, vivid, and engaging exchanges. Students will practice: storytelling; creating and using clear visuals; engaging listeners; demonstrating passion when speaking; responding to questions with clarity and brevity, and, using their distinctive voice as a leadership asset. Each student will learn how to assess his or her own communication capabilities, adjust to different listeners, and how to evaluate speaker effectiveness and provide valuable feedback to others. Video recordings will be used to demonstrate incremental communicative changes throughout the course, and to show how these strategies bring about outstanding leadership.
Credit 3 units.

T55 ETEM 599 Applied Research Study
Applied Research Study (ARS) is an advanced, project- based course designed to allow students to develop in-depth knowledge and further their education building on the education offered in the Programs. Applied research is a type of examination looking to find practical solutions for existing problems. These can include challenges in the workplace, education, and society. Students collaborate with an adjunct faculty advisor to collect data. Findings are applicable and may be implemented upon completion of a study. Applied research focuses on answering one specific applied research question for a client or sponsor. Applied Research Study must have prior approval of a faculty sponsor and the Program Director.
Credit 3 units.