

## **SOLVE INDUSTRY CHALLENGES WITH SCIENCE AND TECHNOLOGY**

Prepare for advanced technical positions and leadership roles by using engineering science, values, and knowledge to optimize solutions to demanding challenges across entire businesses.

Throughout the program, you'll gain the top soft skills sought by employers. You learn how to solve problems creatively, think critically, truly innovate, and communicate in a compelling way to all project stakeholders.

As you learn to connect engineering, technology, and science to practical industrial or business applications, you emerge from the program at the forefront of project management, sustainable energy, agile strategy, smart manufacturing and cybersecurity as a leader in your field.



### **LEARN REAL-WORLD SKILLS**

Our dynamic curriculum consistently adapts to industry trends and is taught by faculty who have firsthand, expert-level experience in business. Every course delivers real-world knowledge you can use immediately in your current role to position yourself for future advancement.

- > How to apply an agile strategy to an existing challenge or opportunity
- > Real-world problem-solving skills from global case studies
- > Analyze data and better manage processes with “Smart manufacturing” techniques
- > Gain greater control of process and solutions as a technology manager
- > Using cybersecurity and the IoT in manufacturing and business
- > Apply enterprise wide global strategies for energy sustainability and management
- > Use engineering sciences and technology to solve building systems
- > Work with world renowned faculty
- > Create a peer network of practicing professionals that can last a lifetime.

### **LEARN FROM A LEADER**

American Society of Engineering Education Ranks Us:

**#1** ENGINEERING TECHNOLOGY ENROLLMENT IN THE U.S.

**#1** FEMALE GRADUATES IN ENGINEERING TECHNOLOGY

U.S. News & World Report Ranks Us:

**#4** UNIVERSITY AS RANKED BY RECRUITERS

**TOP 25** IN AMERICA'S TOP 25 PUBLIC UNIVERSITIES

### **BY GRADUATION YOU CAN:**

- > Guide complex collaborations to drive innovative solutions
- > Improve efficiency, process flows and product quality across new and legacy equipment that's interconnected
- > Apply best practices of advanced networked systems that combine sensors, data, models, and algorithms
- > Mine data, and report valid quantitative or qualitative results to create solutions
- > Judge enterprise cybersecurity and industrial espionage risks
- > Understand operation and maintenance processes for modern high-performance buildings, including indoor air quality and cost-effective, renewable energy savings measures in commercial and industrial facilities
- > Identify and analyze energy-saving opportunities of commercial/ industrial systems with an economic evaluation of energy audit training


### **IS THIS THE PROGRAM FOR YOU?**

The MS in Engineering Technology is designed for students with an undergraduate degree in engineering, engineering technology, science, information technology or business.

The program is uniquely equipped to prepare you for a variety of careers, but it does not prepare you to be a theoretical engineer and shouldn't be confused with a graduate degree in engineering science.



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MORE INFORMATION**

 (877) 497-5851

[online.purdue.edu/programs/engineering/polytechnic-masters-in-engineering-technology](https://online.purdue.edu/programs/engineering/polytechnic-masters-in-engineering-technology)

# ONLINE MASTER OF SCIENCE IN *ENGINEERING TECHNOLOGY*

The online MS in Engineering Technology consists of 30 credits over 11 courses and can be completed in two years.

## Technology from a Global Perspective

**MET 52700**, 3 credit hours

This course gives students from all disciplines the opportunity to learn, research, and discuss, the global challenges faced by professionals when working and interacting with international organizations and companies. Global grand challenges we face as a society and in industry, and how to use technologies to solve these issues, will be covered. Other topics include international business and industry ethics, international cultures in the workplace, and global project management and innovation. Part of the course allows students to explore their own research and higher education passion on a global scale of impact.

## Collaborative Leadership and Agile Strategy

**ENGT 50700**, 3 credit hours

This course provides students with a foundation in collaborative leadership and agile strategy. The course brings together theories and insights from a variety of disciplines including engineering, management, psychology, and social science. Increasingly manufacturing management is being called upon to apply their technical skills in collaborative environments that cut across organizational units and inter-organizational boundaries.

Understanding how to design and guide collaborations and apply agile approaches for meeting strategic objectives is an important skillset and knowledge base in the 21st Century economy, defined more by open networks than the rigid hierarchies of the past.

## Facilities Engineering Technology

**MET 53000**, 3 credit hours

Application of the engineering sciences and technology to modern high performance buildings, which can be net zero in terms of their demand for electricity from the utility grid. Emphasizes residential and commercial facilities along with their impact on human health and comfort. Identifying energy conservation measures and evaluating their economic impact are an important focus of the course.

## Applied Engineering Statistics for Industry

**ENGT 58300**, 3 credit hours

The purpose of this course is to teach technology leaders how to make better decisions regarding business and manufacturing processes by having a deep understanding of process capability. Emphasis is placed on the application of probability, statistical analysis and Design of Experiments (DOE) to understand, determine and develop process capability. Tools and concepts explored in this course include fishbone diagrams, Pareto charts, QA/QC, FMEAs, SPC, Cp/CpK, upper and lower control limits/charts, Six Sigma, ANOVA, and the Taguchi Methodology. Through practical applications and hands — on experiments, this course works to bridge the gap between the classroom and real world experimental design.

## Energy Sustainability and Management

**ECET 53500**, 3 credit hours

The global need for comprehensive energy management to achieve sustainability goals is discussed, including energy efficiency and renewable energy. Energy audits of industrial facilities to identify and implement cost effective opportunities for improved performance are targeted. The importance of post construction monitoring, evaluation, and reporting is emphasized.

## Manufacturing System Design for Sustainability

**ENGT 55000**, 3 credit hours

This course prepares manufacturing and information technology leaders to design and analyze manufacturing processes to achieve manufacturing system objectives that meet internal and external customers' quality, cost and delivery requirements within a safe environment. The course project covers major aspects of manufacturing system design and Industry 4.0 in the context of meeting customer needs. Technology leaders and entrepreneurs learn how to work with others to develop the design of manufacturing systems that are sustainable (business, ecological, social, technological) for the long — term. When to use lean and six — sigma techniques in the context of the manufacturing enterprise system design to meet customer needs will be assessed from a system design perspective, through analytical and computer simulation techniques, and through the use of physical modeling tools.

## Smart Manufacturing and Global Supply Chain Management

**ENGT 58100**, 3 credit hours

Advanced manufacturing uses innovative technology to improve products or processes through the Internet of Things. Smart manufacturing is not limited to emerging technologies; rather, it is composed of efficient, productive, highly integrated, tightly controlled processes across a spectrum of globally competitive U.S. manufacturers and suppliers, including the facilities themselves.

This course will examine the selection, characteristics, and optimization of materials, processes, big data, cloud analysis of design data, control and adaptive theories, and personnel in a production environment. Examining global manufacturing issues through a variety of business examples, you will study the framework that explains the characteristics and challenges surrounding global supply chain management investigating the impact on supplier, manufacturer, and customer.

## Internet of Things and Cybersecurity

**ENGT 58100**, 3 credit hours

The internet has brought about the ability to embed computing into everyday devices to allow them to send and receive information. These devices known as the Internet of Things (IoT) will require management at all levels to understand the inherent security risks due to the interconnection via the internet. Illegally accessing (hacking) IoT is increasingly becoming the most pervasive form of industrial espionage in use today. Understanding the threats aimed at IoT and how to protect IoT will be the key to keeping sensitive corporate information and secrets secure and private, and will require everyone's participation, not just the IT department.

For this course students will learn the basics of research of and into cybersecurity, and the techniques used to commit industrial related crimes; how to detect these potentially catastrophic crimes; and the means to protect one of the company's most important assets ... its systems and data.

## Change Management for Enterprise Sustainability

**ENGT 54000**, 3 credit hours

Change management is at the core of an engineering and technology organization's processes and data, and it affects every member of the enterprise. Change management provides a method for identifying, analyzing, preparing, implementing, validating, and documenting engineering changes throughout a product's lifecycle, communicated in real time. For this course, the core elements, data structures, stakeholder, and workflows of change management and their role as enablers of the digital thread and the digital enterprise are discussed. The application of the industry standard CM2 methodology is emphasized as a strategy to provide control, maintain data integrity, and improve visibility and traceability of changes.

## Research Writing Strategies

**ENGT 60500**, 3 credit hours

The course is designed to provide engineering technology graduate students with the necessary intellectual abilities and knowledge to effectively mine and analyze the literature found in the Purdue University licensed databases and artificial intelligence search engine bots. The course will cover various aspects of research writing, including topic selection, literature review, data collection and analysis, and report writing. Students will learn how to identify appropriate research topics, develop research questions, and conduct a thorough literature review. Graduate Students will also learn how to collect and analyze data, and how to effectively present their findings in a clear and concise manner. The course will emphasize the importance of proper citation and referencing and used in engineering technology research. The course will also cover the use of figures, tables, and other visual aids to enhance the presentation of data following APA 7th edition or newer. During the course, students will be required to write at least five academic research papers for the course.

\*Official course number will be assigned upon approval from the Graduate School.