



# Miami University

Department of Mechanical  
and Manufacturing Engineering

*Hands-on Immersive Experiences*



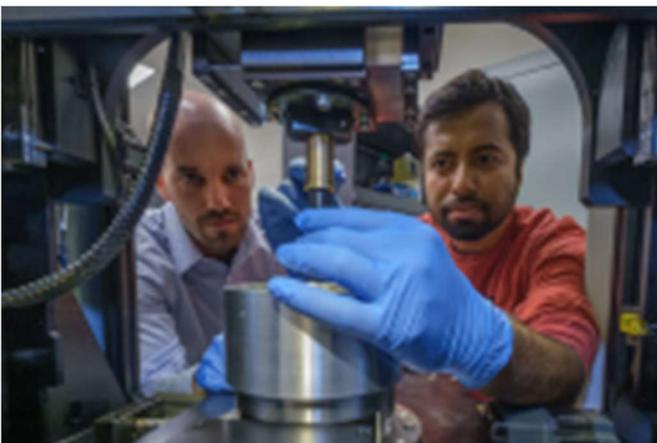
## Pursue Advanced Technical Training

The Department of Mechanical and Manufacturing Engineering (MME) is offering hands-on engineering workshops and short courses for industry professionals at any stage in their career as part of a professional certificate program.

Workshops have no prerequisite course requirement and are held at the state-of-the-art engineering laboratories on Miami's Oxford campus.

An innovative and flexible curricular model allows recognition of these workshops as professional badges and micro-credentials which are stackable toward Graduate or Professional Certificate Programs when completed along with a range of other online courses. Credit earned for these workshops and online courses is college credit that can be applied toward Professional Engineering license continuing education requirements in most states.

The custom workshop content can be modified to meet specific client needs. Working with the MME faculty, companies can customize the workshop curriculum to meet their specific workforce needs to address their current challenges/opportunities.



# Additive & Advanced Manufacturing and Material Testing Workshops

Flexible Scheduling

Summer Term: July to August

Winter Term: January

Weekday and weekend schedules available

Miami faculty and staff with comprehensive experience in industrial consulting and specialized workforce training will lead the workshops. The hands-on nature of workshops will be highly suitable for technical, design, purchasing, and quality control personnel.

Workshop options:

- Custom Advanced Manufacturing Workshop (curriculum directed by the company)
- Material Testing and Sample Preparation
- Additive Manufacturing

Attendees will:

- Attain new skill sets to stay ahead of the rapid pace of technological evolution through specialized training in manufacturing and materials
- Learn how current and new manufacturing processes, such as additive and materials evaluation techniques, can be applied to improve operational efficiency and product development cycles
- Have access to cutting edge facilities and extensive faculty knowledge that is highly applicable to industrial operations and technology adoption

Companies will:

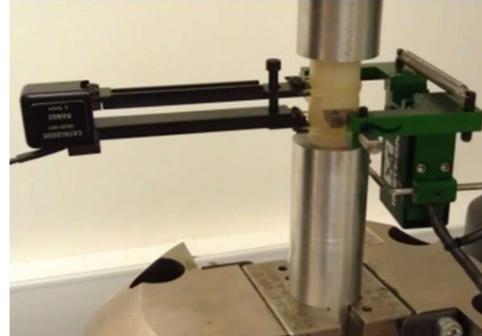
- Improve competitiveness with a trained workforce in emerging areas
- Gain efficiencies and unique capabilities in manufacturing for a competitive advantage in cost, lead time, and quality
- Realize optimal control of manufacturing processes can reduce manufacturing related defects and extend the equipment service life



## Custom Advanced Manufacturing Workshop

Companies work with faculty to create outcomes directly applicable and related to the employee's tasks resulting in increased efficiency and overall cost-savings.

The state-of-the-art knowledge of the Miami faculty and staff is highly applicable to industrial operations and technology and can be leveraged to quickly and efficiently upskill your employees. The workshop curriculum is created to meet your company's needs and can be any combination of virtual and in-person instruction. At the end of the Custom Advanced Manufacturing Workshop, the attendees have the knowledge and hands-on training they can immediately apply to improve the efficiency of operations for the company.



## Material Testing and Sample Preparation Workshop

1.5 credit hours - Approximately 20 hours of instruction

Ensuring the quality of components built using traditional or new manufacturing methods requires an evaluation of the components and/or the manufacturing processes. This is especially true in additive manufacturing, where several build parameters must be specified which can significantly affect the performance of the printed part. This workshop is designed to provide training on test selection, sample preparation, machine selection and programming, and data analysis to evaluate materials and build processes.

### Why is it important:

- New manufacturing techniques such as fused deposition modeling and selective laser melting/sintering/lithography to create parts with mechanical and surface properties quite distinct from cast and forged parts.
- Understanding the origin of defects, directionality, and inherent variability in properties is critical for producing reliable parts and process optimization.

### Topics covered:

- Developing test protocols
- Creating samples
- Machine configuration
- Data collection

### Participants will gain skills and the ability to:

- Select and/or prepare metallic and non-metallic samples to produce reliable and repeatable data.
- Compute test parameters, configure machines for testing, and perform tests for mechanical property determination.
- Generate and analyze test data in conformance with professional testing codes.

# Additive Manufacturing Workshop

2.0 credit hours - Approximately 25 hours of instruction

This workshop will introduce the main technologies available for additive manufacturing. The focus will be on evaluating process capabilities, resulting component/material properties, and process limitations. The workshop is intended to enable the attendee to make informed decisions about the value added by such technologies to existing, more traditional operations.

## Why is it important:

- A hands-on workshop designed to provide experience in additive manufacturing, focusing on setup, operation, post-printing operations, and property evaluation. The lab will use modern equipment and discuss steps to improve feature/part quality. Post-processing techniques will also be covered.
- The benefits of additive manufacturing can include new part features, the creation of custom parts, and reduced development time through faster prototyping.

## Topics covered:

- Introduction to the capabilities of additive manufacturing processes
- Component design – from CAD design to a physical part which is evaluated for quality and continuous improvement
- Process optimization and the basis for selecting the most suitable process

## Participants will gain skills and the ability to:

- Recognize the importance and applications of additive manufacturing
- Create polymeric and metallic parts with specific constraints.
- Devise and perform post process and/or cleaning steps.
- Use additive manufacturing processes to create specialized components.

## For more information about these workshops, please contact:



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