



2023

COURSE CATALOG

5021 Technology Drive, Suite E
Huntsville, AL 35805

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ONLINE COURSES

▶ **ARMY POLICY FOR ADVANCED MANUFACTURING**

Includes: Free 30 minute course designed to inform government and contractor workforce of their responsibilities

▶ **ADDITIVE MANUFACTURING**

Includes: Methods and Materials, Safety, Design, Integration, Lightweighting, Metrology, Prototyping, Reverse Engineering, Supply Chain, and more.

▶ **INDUSTRIAL INTERNET OF THINGS (IIOT)**

Includes: Automation Identification, Cybersecurity, Data Collection and Management, Digital Strategy, Digital Network, Digital Thread, Digital Twin, and Machine Learning.

▶ **COMPUTERIZED NUMERICAL CONTROL (CNC)**

Includes: Programming, Calculations, and Machining.

▶ **INSPECTION**

Includes: Basics of Measurements and Tolerance, Calibration, GD&T Applications, CMM Arms, Laser Trackers, and Testing.

▶ **COMPOSITES**

Includes: Advanced Materials, Advanced Thermoset, Inspections and Prevention, Compression Molding, Processes, Methods, and Safety.

▶ **MATERIALS**

Includes: Ceramics, Composites, Mechanical Properties, Metals, Physical Properties, Plastics, and Thermoplastics.

▶ **DESIGN FOR MANUFACTURING**

Includes: Cost, Manufacturing, Serviceability, and Lightweighting.

▶ **ROBOTICS**

Includes: Applications, Collaborative Robots, Introduction, Maintenance, and Safety.

IN-PERSON COURSES

ADVANCED GEOMETRIC DIMENSIONING & TOLERANCING (GD&T)

Course Description:

This course covers advanced topics Geometric Dimensioning & Tolerancing (GD&T). This advanced class provides a more in-depth study to help you understand, interpret, and apply GD&T. It is based on the ASME Y14.5 standard. This class can be customized to a company using their internal drawings in examples/exercises.

Course Objectives:

- Advanced, in-depth discussions of:
- The GD&T Process
- How the Geometric System Works
- Form and Profile Tolerances
- Orientation, Location and Runout Tolerances
- General Rules of GD&T
- Limit Tolerancing vs. Geometric Tolerancing

Who Should Attend:

- Anyone who needs advanced training in GD&T
- Personnel who have responsibilities in measurements of products
- Anyone involved in CNC programming
- Engineers and Technicians who have responsibilities in design, production or Quality
- Supervisors of operations that apply GD&T

Pricing:

- Contracted option: \$2,200 total for up to 15 people

Course Duration

- 24 Total Hours, **email trainings@amiic.us for available dates**

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IN-PERSON COURSES

BASICS OF OPTICAL MEASUREMENT

Course Summary:

Optical metrology is the science and technology concerning measurement with light. This non-contact measurement method is important to the industry because of the versatile applications from large to small objects while maintaining accuracy. With this technology, it is possible to create digital assemblies and digital twins. After taking this class the participants will be able to; understand different type of optical measurements tools and their applications, understand data outputs, and describe benefits of digital twins and assemblies.

Learning Objectives:

- Understand the types of optical measurement tools, their applications, data output types, and post-processing techniques
- Understand basics of 3D inspection techniques and uses of measurement tools for inspection
- Describe key features and benefits of digital assemblies and digital twins
- Apply basic data capture techniques using optical measurement systems and tools
- Describe system calibration process and importance
- Describe basics of the reverse engineering process

Pricing:

Individual: \$360 per person

Group Discount: 20% for 10+ attendees

Contracted option: \$4,000 for up to 15 attendees

Course Duration:

- 8-hour class, [email trainings@amiic.us](mailto:email_trainings@amiic.us) for available dates

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IN-PERSON COURSES

INTRODUCTION TO ADDITIVE MANUFACTURING (AM) WORKFLOW

Course Summary:

Participants will navigate through each process step required for production of a printed part on a desktop material extrusion system (MakerBot Method X). Fundamentals of Computer-Aided Design (CAD), slicing models via custom print parameters and operation of desktop units will be taught, then evaluated with a hands-on final project. From design to final product, this course will allow users to understand the additive manufacturing workflow while learning about benefits and limitations to the technology.

Learning Objectives:

- Summarize the Additive Manufacturing (AM) workflow
- Describe the benefits and limitations of Material Extrusion AM
- Navigate software to produce Computer-Aided Design (CAD) models
- Prepare files for printing using the MakerBot Print slicer
- Set up a MakerBot Method X unit for building parts
- Recommend solutions for common build errors
- Demonstrate acquired skillsets by completing an AM project

Pricing:

- Open Enrollment Option (Individual): \$1,500 per person
- Contracted Option: \$25,000 for up to 20 people

Course Duration:

- Three full days, [email trainings@amiic.us](mailto:email_trainings@amiic.us) for available dates

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IN-PERSON COURSES

MANUFACTURING PROCESSES - 40 HR

Course Summary/Learning Objective:

Participants will learn the fundamentals of the following manufacturing processes from a certified Drake State instructor: Molding, Forming, Casting, Machining, and Welding. Course material can be customized to accommodate the applications relevant to your organization.

Can be taught as 5 consecutive or non-consecutive days.

Pricing:

- Contracted Option: \$16,800 for up to 10 people

Who Should Attend:

- Engineers and students looking to advance their skills in a technical trade.
Email trainings@amiic.us for available dates.

IN-PERSON COURSES

MBSE 201 - INTRODUCTION TO MODEL-BASED SYSTEMS ENGINEERING FOR MANAGERS (8HR)

Summary:

Model-Based Systems Engineering (MBSE) is the interconnectivity of data sources (digital tools, data bases, applications) using a single authoritative "Source of Truth" to model a physical system across its lifecycle (i.e., a digital twin). It is becoming increasingly mandatory for successful integration and management of DoD architectures, ranging from the smallest drones to the US missile defense system. Because MBSE is comprehensive, but modular, it is capable of solving problems at any level of design and any program lifecycle phase. When applied appropriately, MBSE significantly improves project Scope, Cost, and Time while maintaining Quality across entire project lifecycle.

Learning Objectives:

- Learn MBSE basics and limitations
- Address considerations for making the decision to implement MBSE for a given project
- Provide insight on the value proposition for MBSE
- Understand how to implement select aspects of MBSE, using examples and models

Pricing:

- Individual: \$360 per person
- Group Discount: 20% for 15+ attendees
- Contracted option: \$6,500 for up to 30 attendees (Contracted option can be offered on-site at contractor's office)
- Scheduling Options:
 - Option 1: 1 full, 8-hour day – if at AMIIC, lunch is included
 - Option 2: 2 consecutive half-days

Course Duration:

- 8-hour class, [email trainings@amiic.us](mailto:trainings@amiic.us) for available dates

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IN-PERSON COURSES

MBSE 301 - BASIC MODEL-BASED SYSTEMS ENGINEERING MODELING (40 HR)

Course Summary:

Best practice system modeling building blocks within the context of the system engineering life cycle. This course expands on the Model-Based System Engineering (MBSE) approaches established in the introduction course to demonstrate model interaction/behaviors across the physical/digital system engineering life cycle of requirements, design, analysis, verification, and validation. Examples from industry (good and bad) illustrate how to effectively build and operate common model formats to meet key organizational constraints (technical, schedule and cost). A basic “digital twin” model will be developed in parallel during class instruction to provide a ready reference for building future models. While primarily SysML focused, examples of using alternate tools (e.g., MapleMBSE, DOORS NG, unique application programming interfaces) will be provided as well. Completion of the course provides 70% readiness to take OCSPM Modeler Certification Test.

Pricing:

Individual: \$1500 per person

Group Discount: 20% for 15+ attendees

Course Duration:

- 40 Total Hours, [email trainings@amiic.us](mailto:trainings@amiic.us) for available dates

IN-PERSON COURSES

MBSE 401 -ADVANCED MODEL-BASED SYSTEMS ENGINEERING MODELING (40HRS)

Course Summary:

Participants will learn to leverage tool capabilities to build models that enhance design efficiency and collaboration across organizations. This course expands on Introduction (8-hr) and Basics (40-hr) courses to allow participants to build SysML® modeling competencies using a basic digital model. Applicable to OCSMP Modeler 1 and Modeler 2. **Email trainings@amiic.us for available dates.**

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ONLINE COURSES

ARMY POLICY FOR ADVANCED MANUFACTURING

Summary:

In 2019, the Department of the Army released two documents for Enabling Readiness and Modernization Through Advanced Manufacturing: 1) Army Directive 2019-29, and 2) Implementation Guidance for Army Directive 2019-29. This course was developed to inform the government and contractor workforce of their responsibilities in this Advanced Manufacturing Policy and Implementation Guidance, as well as provide the DoD workforce with training opportunities to satisfy these directives.

Learning Objectives:

- Learn the requirements and guidance detailed in the DA Policy
- Describe the basic principles of Advanced Manufacturing (AdvM)
- Understand the behaviors necessary to incorporate AdvM into the materiel life cycle- practical considerations, organizational responsibilities, etc.

Pricing:

- **Free Course!**

Course Duration:

- 30 minutes

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ONLINE COURSES

ADDITIVE MANUFACTURING

Additive Manufacturing Methods and Materials - AM 141	Beginner
Additive Manufacturing Safety - AM 121	Beginner
Design for Additive Manufacturing - AM 201	Intermediate
Integrating Additive Manufacturing with Traditional Manufacturing - AM 221	Intermediate
Introduction to Additive Manufacturing - AM 111	Beginner
Introduction to Hybrid Manufacturing - AM 151	Beginner
Lightweighting with Additive Manufacturing - AM 271	Intermediate
Managing the Additive Manufacturing Supply Chain - AM 252	Intermediate
Metrology for Additive Manufacturing - AM 202	Intermediate
Nondestructive Testing for Additive Manufacturing - AM 241	Intermediate
Rapid Prototyping - AM 161	Beginner
Reverse Engineering for Additive Manufacturing - AM 242	Intermediate
The Additive Manufacturing Supply Chain - AM 251	Intermediate
The Basic Additive Manufacturing Process - AM 131	Beginner

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ONLINE COURSES

CNC

Basics of G Code Programming - CNC 231	Intermediate
Basics of the CNC Lathe - CNC 211	Intermediate
Basics of the CNC Mill - CNC 212	Intermediate
Calculations for Programming the Lathe - CNC 311	Advanced
Calculations for Programming the Mill - CNC 312	Advanced
Creating a CNC Milling Program - CNC 302	Advanced
Creating a CNC Turning Program - CNC 301	Advanced
Creating a Milling Program - CNC 290	Intermediate
Introduction to CAD and CAM for Machining - CNC 241	Intermediate
Introduction to CNC Machines - CNC 201	Intermediate
Introduction to Multi-Axis CNC Machines - CNC 217	Intermediate

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ONLINE COURSES

COMPOSITES

Advanced Materials for Composites - COMP 135	Beginner
Advanced Thermoset Resins for Composites - COMP 130	Beginner
Composite Inspection and Defect Prevention - COMP 240	Beginner
Introduction to Compression Molding - COMP 170	Beginner
Introduction to Lay-up and Spray-up Molding - COMP 140	Beginner
Overview of Composite Processes - COMP 120	Beginner
Repair Methods for Composites - COMP 250	Advanced
Safety for Composite Processing - COMP 115	Beginner

DESIGN FOR MANUFACTURING

Design for Cost - DFM 210	Intermediate
Design for Manufacturing - DFM 201	Intermediate
Design for Serviceability - DFM 220	Intermediate
Lightweighting Overview - DFM 270	Beginner

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ONLINE COURSES

INDUSTRIAL INTERNET OF THINGS (IIOT)

Automatic Identification Technology - IIOT 141	Beginner
Cybersecurity for Manufacturing Basics - IIOT 101	Beginner
Data and Design Management for Digital Enterprises - IIOT 311	Intermediate
Data Collection Fundamentals - IIOT 121	Beginner
Introduction to Digital Enterprise Strategy - IIOT 251	Intermediate
Introduction to Digital Networks - IIOT 221	Intermediate
Introduction to Digital Thread - IIOT 242	Intermediate
Introduction to Digital Twin - IIOT 241	Intermediate
Introduction to Machine Learning and Artificial Intelligence - IIOT 301	Advanced
Introduction to the Industrial Internet of Things - IIOT 111	Beginner
Machine Learning and Artificial Intelligence Applications - IIOT 302	Advanced

INSPECTION

Basic Measurement - INSP 101	Beginner
Basics of Tolerance - INSP 121	Beginner
Calibration Fundamentals - INSP 111	Beginner
GD&T Applications - INSP 312	Advanced
Introduction to CMM Arms - CNC 362	Advanced
Introduction to GD&T - INSP 301	Advanced
Introduction to Laser Trackers - INSP 365	Advanced
Nondestructive Testing - INSP 211	Intermediate

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ONLINE COURSES

MATERIALS

Introduction to Ceramics - MATL 141	Beginner
Introduction to Composites - COMP 151	Beginner
Introduction to Mechanical Properties - MATL 111	Beginner
Introduction to Metals - MATL 121	Beginner
Introduction to Physical Properties - MATL 101	Beginner
Introduction to Plastics - MATL 131	Beginner
Principles of Injection Molding - MATL 255	Intermediate
Thermoplastics - MATL 251	Intermediate

ROBOTICS

Applications for Robots - ROB 130	Beginner
Introduction to Collaborative Robots - ROB 275	Intermediate
Introduction to Robotics - ROB 201	Intermediate
Robot Applications - ROB 215	Beginner
Robot Maintenance - ROB 170	Beginner
Robot Safety - ROB 211	Intermediate