Introduction Additive Manufacturing

Overview

Course Length: 16 hours *(can be taken via flexible schedule in-center or remotely)*

Description: "Introduction to Additive Manufacturing" provides an overview of additive manufacturing (AM), including its history, advantages, disadvantages, basic steps, methods, and materials. Additive manufacturing is a rapidly growing industry that allows for rapid prototyping and the creation of more complex and functional parts, including end-use parts and traditional manufacturing tooling. AM encompasses a variety of build methods, such as material jetting and material extrusion.

An understanding of the AM basics is useful for anyone working in the manufacturing industry. AM methods often streamline manufacturing processes and improve products and profitability. After completing this class, users will have gained important foundational AM knowledge, including the different AM methods and processes, the uses of AM, and the potential for future AM industrial growth.

Course Objectives/Topics

- Distinguish between additive manufacturing and traditional manufacturing.
- Explain the history of AM.
- Describe the advantages and disadvantages of AM.
- Describe the use of AM as a secondary process.
- Describe the general AM process steps and computer networking.
- Distinguish between AM methods that deposit build material.
- Distinguish between AM methods that manipulate build material in or on a component.
- Describe the different ways in which AM techniques construct part layers.
- Describe considerations for designing for AM.
- Describe the types of AM materials.
- Describe the types of available additive manufacturing machines.
- Describe AM support structures and part orientation.
- Describe AM post-processing.
- Describe CAD software and its use in additive manufacturing.
- Describe the use of STL and related files in AM.
- Describe G-code and its use in additive manufacturing.
- Describe the future of additive manufacturing.
- **Please see page 2 for detailed topic list**

Prerequisites

General knowledge of design, engineering or manufacturing processes.

Audience

This program is designed for anyone who designs, drafts, engineers, purchases, manufactures parts and assemblies. Particular emphasis is placed on those who design and manufacture.

Course Outlines

Introduction to Additive Manufacturing

- Introduction to Additive Manufacturing
- The History of Additive Manufacturing
- Additive Manufacturing Advantages and Disadvantages
- Additive Manufacturing as a Secondary Process
- Additive Manufacturing Basics Review
- General Additive Manufacturing Process Steps and Computer Networking
- Material Deposition AM Methods
- Other Additive Manufacturing Methods
- Additive Manufacturing Layer Construction Techniques
- Additive Manufacturing Methods Review
- Design for Additive Manufacturing
- Additive Manufacturing Material Types
- Additive Manufacturing Machine Types
- Support Structures and Part Orientation
- Post-Processing
- Additive Manufacturing Considerations Review
- CAD Software
- STL Files
- G-Code
- The Future of Additive Manufacturing
- Final Review