

“Our first priority is making America a magnet for new jobs and manufacturing. After shedding jobs for more than 10 years, our manufacturers have added about 500,000 jobs over the past three years...There are things we can do, right now, to accelerate this trend. Last year, we created our first manufacturing innovation institute [America Makes] in Youngstown, Ohio. A once-shuttered warehouse is now a state-of-the-art lab where new workers are mastering the 3D printing that has the potential to revolutionize the way we make almost everything.”

- President Barack Obama, 2013 State of the Union Address

“The Boeing Company recognizes the need for new manufacturing methods, materials development and training innovation. Additive Manufacturing technologies have fundamentally changed how we think about design, fabrication, and support in aerospace manufacturing.”

- Orval M. “Jack” Nobles, Principal Investigator - Engine 4, The Boeing Company

“Stratasys has been a part of this transformational technology for 25 years and has seen the demand sky rocket in the past seven years. There a critical need for skilled workers with the capability to design for both subtractive and additive manufacturing processes as well as a critical need for lab technicians, operators and application engineers to manage and maintain the growing population of additive manufacturing equipment in the field.”

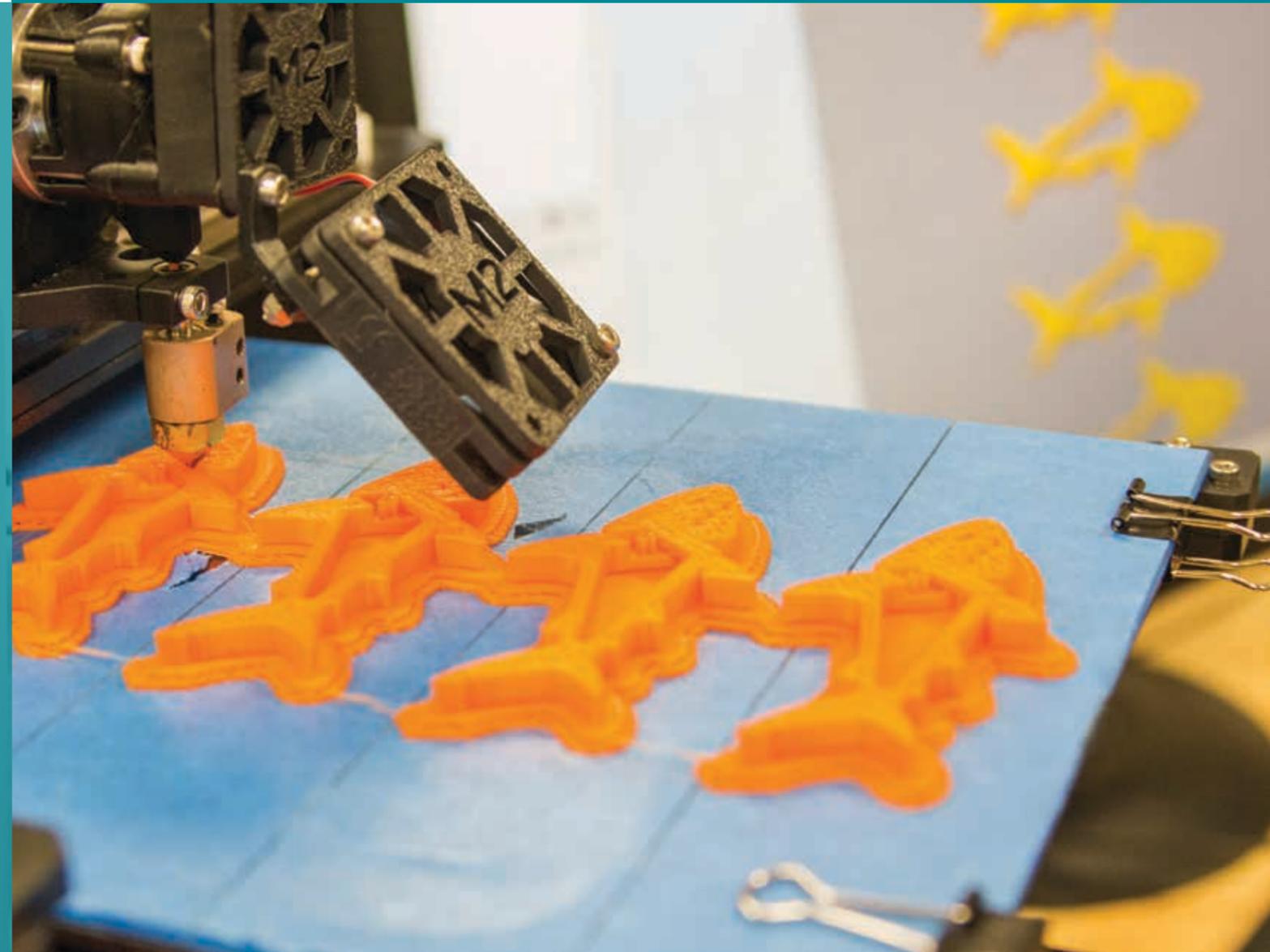
- Jesse Roitenberg, Education Manager, Stratasys

“Our next generation of engineering leaders is already thinking in 3D. We are aggressively deploying the engineering and manufacturing capabilities that allow these future leaders to think additively and innovate with purpose.”

- Steve Betza, Lockheed Martin’s Director of Advanced Manufacturing

**For more information, visit our website at [www.tri-c.edu/3Dmfg](http://www.tri-c.edu/3Dmfg).**

*Financial aid may be available for those who qualify*



### Grant Partners



### Regional Industry Partners



3D Digital Design & Manufacturing Technology Program funded through a U.S. Department of Labor (DOL) Employment, Training and Administration (ETA) grant.

16-0711

# 3D Digital Design & Manufacturing Technology

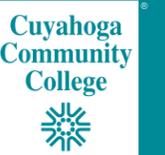
CERTIFICATE PROGRAM

## Change the World With 3D Printing

### Have you heard of 3D Printing?

In today's industry, the technology is called Additive Manufacturing and it's changing the world. The uses of Additive Manufacturing are limitless, and companies need people trained in using this new technology.

**That's where Tri-C® can help.**



## Why Additive Manufacturing:

### What is Additive Manufacturing?

- Emerging technology, often referred to as 3D printing
- Digital model used to make three-dimensional solid object
- Achieved by consecutively adding layers of materials to construct an object from a digital image

### Industry Overview\*:

- Additive Manufacturing is one of 10 fastest-growing industries in America
- Local companies have adopted the technology and will need to hire skilled workers
- The 3D printing industry is expected to continue strong, double-digit growth during the decade\*
- By 2017, the sale of 3D printed products and services will approach \$6 billion worldwide\*
- By 2021, forecasts indicate the industry will reach \$10.8 billion\*
- America Makes, the National Additive Manufacturing Innovation Institute, is located in Youngstown and includes more than 100 industry, academia and government member organizations, many of which have presence in Ohio

\*(SOURCE: The Wohlers Report, 2014)

### Career Options:

Additive Manufacturing technicians specialize in the design, development and implementation of 3D printing processes, technologies and facilities. Jobs responsibilities often include:

- Ability to work independently, as a member of a team or as a supervisor of other technicians
- Highly skilled at operating electromechanical equipment and systems
- Firm knowledge of computer-aided design (CAD) processes and software, innovative ability to create 3D models
- Provide technical support to engineers on assembly, troubleshooting and repair of computer-controlled 3D printing equipment, conduct testing on 3D printers
- Prepare and maintain lab components and tools, ensure procedures are properly executed

### Job opportunities for program graduates include:

- 3D Designer
- 3D Solid Modeler
- CAD Technician
- Additive Technician
- Manufacturing Technician
- CAD Drafter
- Solidworks Designer
- Engineering Technician

Salaries range from \$29,000 to \$41,000 (Source [www.indeed.com/salary](http://www.indeed.com/salary) and student employment)

### Program Overview

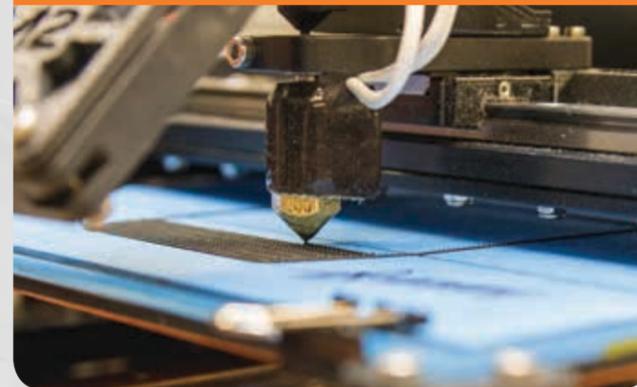
The 3D Digital Design & Manufacturing Technology Certificate Program is a one-year program designed to train skilled workers in the field of 3D digital design and subtractive and additive manufacturing technologies.

### Requirements

- High school diploma or GED
- COMPASS assessment for mathematics and English

### Highlights

- Earn the one-year certificate with only 32 credit hours
- Flexible scheduling for day and evening courses
- Credits can be transferred to Tri-C's Associate of Applied Science Degree in Manufacturing Industrial Engineering Technology or to four-year colleges and universities
- Internship opportunities for those who qualify
- Job placement and career services available
- Financial aid may be available for those who qualify



We know you want a good career with a strong **future**.  
We can give you options.

## Program Sequence

Course Name	Course Number	Credits
<b>Digital Design &amp; Product Innovation Short-Term Certificate</b>		
AutoCAD Drawings	MET 1230	3
MET Elective*	MET XXXX	3
Introduction to Additive Manufacturing	MET 1250	3
Production Ideation & Design	MET 1260	3
Technology Orientation	MET 1100	2
MET Elective*	MET XXXX	2
<b>Total Credits</b>		<b>16</b>
<b>Digital Manufacturing &amp; Product Launch Short-Term Certificate</b>		
3D Solid Modeling	MET 2601	3
3D Printing & Scanning for Reverse Engineering & Inspection	MET 2150	3
Engineering Materials and Metallurgy	MET 1300	3
Additive Manufacturing Internship	MET 2941	1
MET Elective*	MET XXXX	3
Capstone: Project Based/Team Oriented	MET 2190	3
<b>Total Credits</b>		<b>16</b>
<b>Total Credits for One-Year Certificate of Proficiency</b>		<b>32</b>

\*Department Approval Required

## Outcomes

- Learn 3D computer-aided drafting software, 3D scanners, 3D printers, reverse engineering software and rapid prototyping
- Help preparing for the nationally recognized Society of Manufacturing Engineer's Additive Manufacturing Certificate exam
- Earn two short-term 3D/AM certificates that lead to One-Year Certificate of Proficiency in 3D Digital Design & Manufacturing Technology
- Master manufacturing technology and engineering principles, opportunity to gain employment in additive manufacturing fields

Contact us today at 216-987-2769 or email [3Dmfg@tri-c.edu](mailto:3Dmfg@tri-c.edu) to make an appointment to discuss your future in 3D Digital Design and Additive Manufacturing.