

# 3D DIGITAL DESIGN & MANUFACTURING TECHNOLOGY, CERTIFICATE OF PROFICIENCY



This program is for the students who wish to acquire skills in the operations of 3D printers and the use of CAD/CAM packages in order to gain entry-level employment in varying operations involved in manufacturing with emphasis on additive manufacturing. Students will get background knowledge to aid them in the field of (AM) additive manufacturing, (RP) rapid prototyping, and 3D printing. There will be two (2) short-term certificates: 1) Digital Design & Product Innovation, 2) Digital Manufacturing & Product Launch, which together, lead to the award of Certificate of Proficiency in Additive Manufacturing.

**Program contact:** Learn more

**This certificate will be automatically awarded when the certificate requirements are completed. If you do not want to receive the certificate, please notify the Office of the Registrar at [RegistrarOffice@tri-c.edu](mailto:RegistrarOffice@tri-c.edu).**

Learn more about how certificate credits apply to the related degree.

## Program Admission Requirements

- For admission information, contact us at 216-987-2769.
- High School Diploma/GED
- ENG-0995 Applied College Literacies or appropriate English placement score recommended.
- MATH-0965 Intermediate Algebra or qualified Math placement.

## Program Learning Outcomes

This program is designed to prepare students to demonstrate the following learning outcomes:

1. Communicate effectively and efficiently with diverse individuals and teams, all levels of employees, customers, and suppliers by means of verbal, written (memos, reports, emails, etc.), graphics, symbols, and effective listening skills and using appropriate technology.
2. Complete tasks and projects on schedule through the effective use of time management, appropriate math skills, and teamwork that fosters inclusion, synergized efforts in problems identification, and troubleshooting for successful resolution of problems towards the achievement of set goals and objectives.
3. Apply quality systems, principles, concepts, and utilizing appropriate math, measurement and statistical tools and technology to improve processes, product quality, and to enhance productivity.

4. Incorporate safety awareness, principles and practices in every aspect of work and as a way of life, including machine safety, environmental safety, chemical safety, and personal/employee protection.
5. Apply knowledge of machines' principles and operation, tools and materials to select operations' parameters in order to program, setup, and operate production manufacturing equipment, and also to be able to troubleshoot and diagnose equipment used in additive manufacturing technologies.
6. Apply the knowledge of material science, machine tolerances, blueprint/schematics, and hands-on skills in additive manufacturing equipment for the development of designed parts and incorporating accepted industry methods.
7. Apply the knowledge of the principles of drafting and the communication of ideas, designs and visualization skills as the language of the engineering field, including the creation and interpretation of drawings using proper dimensioning and tolerance for size and geometry, and use of 3D Modeling drawing programs to incorporate proper industry acceptable standards and conventions.
8. Apply the basic principles of equipment maintenance, troubleshooting, and problem solving techniques to maintain industrial machines that ensure the production of quality products.

## Suggested Semester Sequence

First Semester		Credit Hours
MET-1100	Technology Orientation	2
MET-1230	Drawing & AutoCAD	3
MET-1250	Introduction to Additive Manufacturing	3
MET-1261	Product Ideation & Design I	3
<b>Credit Hours</b>		<b>11</b>
Second Semester		
MET-1270	Additive Manufacturing Processes	3
MET-1300	Engineering Materials and Metallurgy	3
MET-2601	3D Solid Modeling	3
MET-XXXX	Elective	3
<b>Credit Hours</b>		<b>12</b>
Summer Session		
MET-2151	3D Digital Design & Printing	3
MET-2160	3D Scanning, Reverse Engineering, and Quality Inspection	3
MET-2990	Product Development and Manufacture	3
MET-2941	Additive Manufacturing Internship	1-4
<b>Credit Hours</b>		<b>10-13</b>
<b>Total Credit Hours</b>		<b>33-36</b>

MATH-1140, MATH-1141, MATH-1200, MATH-1270, and MATH-1280 can no longer count towards fulfilling the college-level mathematics requirement. These courses were re-classified as developmental mathematics by the state of Ohio in 2016. Tri-C established a 5-year transitioning window for students who had completed these courses prior to 2016 to apply them towards meeting graduation requirements, which expired in Summer 2021. It is highly recommended to see a counselor to determine the appropriate math required for your current major.