

MANUFACTURING TECHNOLOGY

CNC Machining & CAD/CAM

(formerly Product and Process Technology)

Applied Science and Engineering Technology Division

2021-2022

The associate of applied science degree with specialization in product and process technology is designed to prepare students for careers in high-performance manufacturing of consumer goods. This degree will provide students with a foundation in manufacturing design, precision machining and tooling, and complex computer-aided design and computer-aided manufacturing (CAD/CAM). Students will learn tooling process and equipment requirements, design, analysis and process planning and also receive instruction in manual and computer-numerical-control (CNC) mills, machining centers, lathes, grinders, robotic integration and support processes, procedures and practices. This program is focused on beginner, intermediate and advanced levels of the product and process. Students will learn “soft” skills in problem solving, teamwork and communication. Students can graduate with real world skills to be productive in CNC and CAD/CAM.

NOTE: MCCC is a FANUC Certified Education Training Center.

Career Opportunities

Graduates of this program will be prepared to pursue careers in the manufacturing technology field such as:

- Automation and control technician analyst
- CAD/CAM technician
- CNC programmer/operator
- CNC set-up technician
- Engineering technician
- Industrial engineer production team leader
- Machine technician
- Machinist
- Manufacturing technician
- Process planner lab technician
- Sales and service engineer

Note: The following codes identify courses that satisfy MCCC's General Education Requirements:

- (C1) GE Natural Sciences Competency
- (C2) GE Mathematics Competency
- (C3) GE Writing Competency
- (C4) GE Computer Literacy Competency
- (C5) GE Human Experience Competency
- (C6) GE Social Systems Competency

Credits

Required General Education Courses

21

- C1 PHY 101 (Technical Physics)
or PHY 151 (General Physics I)
or CHEM 150 (Fundamental Principles of Chemistry)
or CHEM 151 (General College Chemistry I) 4
- C2 MATH 124* (Technical Mathematics II)
or competency 4
- C3 ENGL 151 (English Composition I) 3
- C4 MDTC 160 (Mechanical Drafting CAD I) 4
- C5 Expressions of the Human Experience Competency . . . 3
- C6 Social Systems Competency 3

See the General Education Requirements on the MCCC website for a list of courses that satisfy the General Education Learning Competencies.

Credits

Required Core Courses

47-49

1st Semester

- MECH 102 (Manufacturing Processes) 4
- MECH 103 (Machining Basics and CNC) 4
- MDTC 160 (Mechanical Drafting and CAD I) C4
- MATH 119* (Elementary Technical Mathematics) 2

2nd Semester

- QSTC 150 (Introduction to Metrology) 3
- MATL 101 (Industrial Materials) 3
- MECH 104 (CNC II) 3
- MECH 201 (CAD/CAM Milling I) 3
- MATH 124* (Technical Mathematics II) C2

3rd Semester

- MECH 105 (CNC III) 3
- MECH 221 (CAD/CAM Lathe) 3
- MDTC 226 (Geometric Dimensioning and Tolerancing) 3
- Restricted Electives 3-4

4th Semester

- MECH 131 (Introduction to Automated Manufacturing) 3
- METC 220 (Statics & Strength of Materials) 4
- MECH 231 (CAD/CAM Milling II) 3
- Restricted Electives 3-4

Restricted Electives List (select two)

- QSTC 210 (Advanced Metrology) 3
- METC 170 (Introduction to Parametric CAD/CATIA) 3
- WELD 100 (Introduction to Welding Processes) 4
- MDTC 228 (Introduction to Solid Modeling – SOLIDWORKS) 3

Total Degree Requirements

68-70 credits

Total Degree Cost

84 minimum billable contact hours

** Program requires at least 6 credit hours of MATH. MATH 119 (Elementary Technical Mathematics) and MATH 124 (Technical Mathematics II) are required for students whose goal is to complete the associate of applied science degree and seek employment. MATH 157 (College Algebra) and MATH 159 (Trigonometry and Analytical Geometry) are recommended for students interested in transferring to a four-year institution. Other MATH courses may be selected for transfer depending on the student's choice of transfer institution. Students interested in transfer are encouraged to seek the assistance of a faculty advisor or admissions counselor.*



Certificate Program: Manufacturing Technology

In addition to the two-year associate degree program, Monroe County Community College offers a certificate program in product and process technology. We recognize that many employers place value on a certificate which authenticates specialized educational preparation. The program concentrates upon basic core courses with skill development and job upgrading being the primary objectives. All courses taken in the certificate program are applicable toward the associate of applied science degree. Certificates give students a competitive edge in the product and process environment.

Certificate: CNC Technician*

| | Credits |
|--|---------|
| MECH 103 (Machining Basics and CNC) | 4 |
| MECH 104 (CNC II) | 3 |
| MECH 105 (CNC III) | 3 |
| MECH 201 (CAD/CAM Milling I) | 3 |
| MDTC 160 (Mechanical Drafting and CAD I) | 4 |

Total Certificate Requirements 17 credits
Total Certificate Cost 24 minimum billable contact hours

* **FANUC Education Training Certificate awarded upon successful completion of MECH 104 (CNC II) and MECH 105 (CNC III).**

Certificate: CAD/CAM Technician

| | Credits |
|--|---------|
| MECH 103 (Machining Basics and CNC) | 4 |
| MECH 201 (CAD/CAM Milling I) | 3 |
| MECH 221 (CAD/CAM Lathe) | 3 |
| MECH 231 (CAD/CAM Milling II) | 3 |
| MDTC 160 (Mechanical Drafting and CAD I) | 4 |

Total Certificate Requirements 17 credits
Total Certificate Cost 24 minimum billable contact hours

Certificate Program: Metrology Technology

Students wishing to have an additional certificate in the metrology (or measurement) area with emphasis on coordinate measuring and machining and various articulated measuring arms use should consider the following certificate. A number of courses taken in the manufacturing program (formerly product and process technology) will apply to the certificate below.

In addition to the two-year associate degree program, Monroe County Community College offers a certificate program in metrology technology. We recognize that many employers place value on a certificate which authenticates specialized educational preparation. The program concentrates upon basic core courses with skill development and job upgrading being the primary objectives. All courses taken in the certificate program are applicable toward the associate of applied science degree.

| | Credits |
|---|---------|
| MDTC 160 (Mechanical Drafting and CAD I) | 4 |
| MDTC 226 (Geometric Dimensioning and Tolerancing) | 3 |
| MECH 103 (Machining Basics and CNC) | 4 |
| MATH 119 (Technical Mathematics I) | 2 |
| MATH 124* (Technical Mathematics II) | 4 |
| QSTC 150 (Introduction to Metrology) | 3 |
| QSTC 210 (Advanced Metrology) | 3 |

Total Certificate Requirements 23 credits
Total Certificate Cost 29 minimum billable contact hours

* Students should be able to test into MATH 124 (Technical Mathematics II) or take MATH 119 (Elementary Technical Mathematics) if the standard is not met.

Information contained within this document is subject to change. This program sheet may not be considered as an agreement or contract.

Monroe County Community College is an equal opportunity institution and adheres to a policy that no qualified person shall be discriminated against because of race, color, religion, national origin or ancestry, age, gender, marital status, disability, genetic information, sexual orientation, gender identity/expression, height, weight or veteran's status in any program or activity for which it is responsible. If you have a disability and need special accommodations, please contact the Student Success Center (734.384.4167) at least 10 business days prior to the first class session to begin the accommodation process.

The college's Equal Opportunity Officer and Title IX and Section 504/ADA Coordinator and Compliance Officer for discrimination and sexual harassment is the Director of Human Resources,
 Monroe County Community College, 1555 South Raisinville Road, Monroe, Michigan 48161, 734.384.4245.

Monroe County Community College is accredited by the Higher Learning Commission, www.hlcommission.org, 800.621.7440.

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