# ACCOUNTING

## Business Division

The associate of applied science degree with specialization in accounting is designed to provide practical and theoretical preparation for positions leading to supervisory and administrative assignments. In addition to completion of the required general education courses, students desiring the program designation on their transcript must complete the required core and specialized courses. This curriculum provides preparation for careers in business accounting departments and accounting firms.

### Career Opportunities

Accounting remains one of the more sought after disciplines in the job market. According to Randstad USA, the median salary for a staff accountant position can start at $55,000, and the demand for accountants is on the rise. Please see the following link for more info: https://www.randstadusa.com/workforce360/workforce-insights/2014-hot-jobs-finance-accounting/163/.

### Transfer Information

An associate degree in accounting from MCCC offers easy transfer to many of the four-year programs in Michigan and surrounding states, such as the University of Michigan, Northwood University, Eastern Michigan University, Davenport University, Walsh College, University of Toledo, Siena Heights University and more.

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

### Additional Program Highlights

- All MCCC accounting courses are available in an online format, allowing for convenient access.
- Completing the first two years of a four-year accounting program at MCCC and then transferring the credits can result in savings of up to 75 percent of the cost of completing the entire program at a private institution.

## Certificate Program: Accounting

This certificate may be completed fully online via the MCCC-Online Option.

| Required Core Courses | Credits |
| --- | --- |
| ACCTG 151 (Accounting Principles) | 4 |
| ACCTG 152 (Accounting Principles) | 4 |
| ACCTG 201 (Microcomputer Accounting I) | 3 |
| ACCTG 205 (Microcomputer Accounting II) | 3 |
| ACCTG 220 (Payroll Accounting) | 3 |
| ACCTG 251 (Intermediate Accounting I) | 4 |
| ACCTG 252 (Cost Accounting) | 4 |
| ACCTG 254 (Intermediate Accounting II) | 4 |
| ACCTG 255 (Introduction to Taxation) | 3 |
| BUSAD 151 (Introduction to Business) | 4 |
| CIS 109 (Spreadsheet Software) | 3 |

| | |
| --- | --- |
| **Total Certificate Requirements** | **39 credits** |
| **Total Certificate Cost** | **39 minimum billable contact hours** |

## Associate of Applied Science: Accounting

| Required Core Courses | Credits |
| --- | --- |
| | **39** |

**1st Semester**

| | |
| --- | --- |
| ACCTG 151 (Accounting Principles) | 4 |
| BUSAD 151 (Introduction to Business) | 4 |

**2nd Semester**

| | |
| --- | --- |
| ACCTG 152 (Accounting Principles) | 4 |
| ACCTG 220 (Payroll Accounting) | 3 |
| CIS 109 (Spreadsheet Software) | 3 |

**3rd Semester**

| | |
| --- | --- |
| ACCTG 201 (Microcomputer Accounting I) | 3 |
| ACCTG 251 (Intermediate Accounting I) | 4 |
| ACCTG 255 (Introduction to Taxation) | 3 |

**4th Semester**

| | |
| --- | --- |
| ACCTG 205 (Microcomputer Accounting II) | 3 |
| ACCTG 252 (Cost Accounting) | 4 |
| ACCTG 254 (Intermediate Accounting II) | 4 |

| Suggested General Electives | 3 |
| --- | --- |

(to complete degree requirements, not limited to those courses listed)

| | |
| --- | --- |
| BMGT 201 (Principles of Management) | 3 |
| BMGT 220 (International Business) | 3 |
| BSLW 251 (Business Law) | 4 |
| ECON 251 (Principles of Macroeconomics) | 3 |
| ECON 252 (Principles of Microeconomics) | 3 |
| ENGL 155 (Technical Writing) | 3 |
| PSYCH 151 (General Psychology) | C6 |
| SPCH 151 (Communication Fundamentals) | 3 |

| Required General Education Courses | 19-20 |
| --- | --- |
| C1 Natural Science Competency | 4 |
| C2 Mathematics Competency | 3 or 4 |
| C3 ENGL 151 (English Composition I) | 3 |
| C4 Computer Literacy Competency | 3 |
| C5 Expressions of the Human Experience Competency | 3 |
| C6 Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

| | |
| --- | --- |
| **Total Degree Requirements** | **61-62 credits** |
| **Total Degree Cost** | **62 minimum billable contact hours** |

The associate of applied science in accounting may be completed* via the MCCC-Online Option. To learn more, contact a counselor, academic advisor, program faculty member or the Business Division dean to explore options.

*\* Not all courses are offered online every semester.*
*\* Additional course fees may apply.*

# AGRICULTURE - Agribusiness Pathway

## Business Division

The agriculture program at Monroe County Community College provides students with a solid background in plant and soil science, precision agriculture, agriculture management, entomology, plant pathology and additional fundamentals of core business courses.

## Career Opportunities in Agribusiness

Graduates typically will find employment opportunities in:
- Agribusiness opportunities such as farm insurance, commodity marketing, farm supply businesses
- Crop and farm product processing facilities
- Crop production management
- Equipment retail sales and service
- Farm operations
- Production and agriculture service companies

## Program and Transfer Information

Michigan State University and MCCC have partnered together to offer students an opportunity to earn a certificate in agricultural operations and an associate of applied science in agri-business. The certificate, awarded by MSU, will include 34 credits of agriculture-oriented courses through the Institute of Agricultural Technology, combined with a minimum of 28-29 additional credits from MCCC to total 62-63 credits.

The associate of applied science awarded by MCCC will include 34 credits offered by the MSU/Institute of Agricultural Technology plus 19-20 general education credits and a minimum of 9 elective credits from MCCC to equal 62-63 total credits.

Students wishing to work toward a bachelor's degree may receive preferred transfer status at Michigan State University after earning the associate degree at MCCC.

For more information please contact Andrew McCain, program coordinator, at 734.384.4155 or amccain@monroeccc.edu.

## Courses Delivered By The Michigan State University - Institute of Agriculture Technology

|  | Credits 28 |
|---|---|
| ABM 130 (Farm Management I) | 3 |
| AE 131 (Agricultural Water Resource Management) | 3 |
| AE 143 (Application of Precision Agriculture Technologies) | 3 |
| AT 202 (Agricultural Regulation, Compliance and Safety) | 3 |
| AT 293 (Professional Internship in Agricultural Technology) | 3 |
| CSS 101 (Introduction to Crop Science) | 3 |
| CSS 105 (Agricultural Industries Seminar) | 1 |
| CSS 126 (Introduction to Weed Management) | 2 |
| CSS 143 (Introduction to Soil Science) | 2 |
| ENT 110 (Applied Entomology of Economic Plants) | 3 |
| PLP 105 (Fundamentals of Applied Plant Pathology) | 2 |
| A minimum of 6 additional MSU CANR/IAT credits must be completed with approval from the program coordinator | 6 |

## Total MSU/IAT Program Credits          34 credits

## Courses Delivered by Monroe County Community College

|  |  | Credits |
|---|---|---|
| **General Education Competency Requirements** |  | **19-20** |
| C1 | Natural Science Graduation Elective | 4 |
| C2 | Mathematics Competency Elective | 3 or 4 |
| C3 | ENGL 151 (English Composition I) | 3 |
| C4 | BMGT 160 (Managing in the Digital Enterprise) or CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5 | Human Experience Competency Elective | 3 |
| C6 | Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

## Students must also complete an additional 9 elective credits offered at MCCC

|  | Credits |
|---|---|
| *(Recommended options, not limited to those listed)* | **9** |
| ACCTG 151 (Accounting Principles) | 4 |
| BMGT 201 (Principles of Management) | 3 |
| BSLW 251 (Business Law) | 4 |
| BUSAD 151 (Introduction to Business) | 4 |
| BUSAD 170 (Small Business and Entrepreneurship) | 3 |
| ECON 251 (Principles of Macroeconomics) | 3 |
| ECON 252 (Principles of Microeconomics) | 3 |
| MCOM 201 (Principles of Marketing) | 3 |

## Total Credits Needed to Earn An MSU Certificate and an Associate of Applied Science in Argibusiness          62-63 credits

# AGRICULTURE - Agricultural Operations Pathway

## Business Division

The agriculture program at Monroe County Community College provides students with a solid background in plant and soil science, precision agriculture, agriculture management, entomology, plant pathology and additional fundamentals of agriculture.

### Career Opportunities in Ag Operations

Graduates typically will find employment opportunities in:

- Crop and farm product processing facilities
- Crop production management
- Equipment retail sales and service
- Farm operations
- Production and agriculture service companies

### Program and Transfer Information

Michigan State University and MCCC have partnered together to offer students an opportunity to earn a certificate in agricultural operations and an associate of applied science in agriculture. The certificate, awarded by MSU, will include 34 credits of agriculture-oriented courses through the Institute of Agricultural Technology, combined with a minimum of 26 additional credits from MCCC to total 60 credits.

The associate of applied science awarded by MCCC will include 34 credits offered by the MSU/Institute of Agricultural Technology plus 19-20 general education credits and a minimum of 6-7 elective credits from MCCC to equal 60 total credits.

Students wishing to work toward a bachelor's degree may receive preferred transfer status at Michigan State University after earning the associate degree at MCCC.

For more information please contact Andrew McCain, program coordinator, at 734.384.4155 or amccain@monroeccc.edu.

### Courses Delivered By The Michigan State University - Institute of Agriculture Technology

|  | Credits 28 |
|---|---|
| ABM 130 (Farm Management I)3 | 3 |
| AE 131 (Agricultural Water Resource Management) | 3 |
| AE 143 (Application of Precision Agriculture Technologies) | 3 |
| AT 202 (Agricultural Regulation, Compliance and Safety) | 3 |
| AT 293 (Professional Internship in Agricultural Technology) | 3 |
| CSS 101 (Introduction to Crop Science) | 3 |
| CSS 105 (Agricultural Industries Seminar) | 1 |
| CSS 126 (Introduction to Weed Management) | 2 |
| CSS 143 (Introduction to Soil Science) | 2 |
| ENT 110 (Applied Entomology of Economic Plants) | 3 |
| PLP 105 (Fundamentals of Applied Plant Pathology) | 2 |

A minimum of 6 additional MSU CANR/IAT credits must be completed with approval from the program coordinator........ 6

### Total MSU/IAT Program Credits          34 credits

### Courses Delivered By Monroe County Community College

|  | Credits |
|---|---|
| **General Education Competency Requirements** | **19-20** |
| C1  Natural Science Graduation Elective | 4 |
| C2  Mathematics Competency Elective | 3 or 4 |
| C3  ENGL 151 (English Composition I) | 3 |
| C4  BMGT 160 (Managing in the Digital Enterprise) or CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5  Human Experience Competency Elective | 3 |
| C6  Social Systems Competency Elective | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

### Students must also complete an additional 6-7 elective credits offered at MCCC

|  | Credits |
|---|---|
| *(Recommended options, not limited to those listed)* | **6-7** |
| ACCTG 151 (Accounting Principles) | 4 |
| ACCTG 152 (Accounting Principles) | 4 |
| AST 102 (Electrical Systems I) | 4 |
| BIOL 156 (Introduction to Environmental Science) | 4 |
| BIOL 251 (Elements of Botany) | 4 |
| BUSAD 151 (Introduction to Business) | 4 |
| BUSAD 170 (Small Business and Entrepreneurship) | 3 |
| BMGT 160 (Managing in the Digital Enterprise) | 3 |
| BMGT 201 (Principles of Management) | 3 |
| BSLW 251 (Business Law) | 4 |
| CHEM 150 (Fundamental Principles of Chemistry) | 4 |
| ESC 151 (Earth Science) | 4 |
| ECON 251 (Principles of Macroeconomics) | 3 |
| ECON 252 (Principles of Microeconomics) | 3 |
| ELEC 125 (Fundamentals of Electricity) | 3 |
| GEOG 151 (Elements of Physical Geography) | 4 |
| MCOM 201 (Principles of Marketing) | 3 |
| MET 151 (Introduction to Meteorology) | 4 |
| WELD 100 (Introduction to Welding Processes) | 4 |

### Total Credits Needed To Earn A Certificate and an Associate of Applied Science          60 credits

# AUTOMOTIVE ENGINEERING TECHNOLOGY

## Applied Science and Engineering Technology Division

The associate of applied science degree with specialization in automotive engineering technology is structured to provide the technical knowledge and mechanical abilities necessary to work in today's growing automotive research and development industry. Automotive engineering technicians assist engineers in design and development work. They help determine the practicality of a proposed product design change and plan and carry out tests on experimental test devices and equipment for performance, durability and efficiency. As part of the testing procedure, they record data, make computations, plot graphs, analyze results, write reports and often make recommendations for improvements to meet performance requirements. The automotive engineering technician makes use of various mechanical and electrical test instruments and gauges, including engine and chassis dynamometers, road simulators, flow benches and computer-controlled data gathering devices. The curriculum is planned to prepare the graduate to perform duties concerned with design, testing and development activities in direct support of the automotive engineer.

## Career Opportunities

Graduates of this program will be prepared for entry-level employment in the following areas:

- Automotive engineering technician
- Dynamometer Technician
- Engineering technician
- Factory technical representative
- Research and development technician
- Research technician
- Sales engineer
- Test Engineer, Automotive

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*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

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| Required General Education Courses | Credits<br>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 and CAD I) | 4 |
| C5  Expressions of the Human Experience Competency | 3 |
| C6  Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

| Required Core Courses | Credits<br>34 |
|---|---|
| **1st Semester** | |
| MATH 119* (Elementary Technical Mathematics) | 2 |
| ELEC 125 (Fundamentals of Electricity and Electronics) | 3 |
| AUTO 101 (Internal Combustion Engines) | 4 |
| **2nd Semester** | |
| AUTO 102 (Automotive Electricity and Electronics) | 4 |
| AUTO 107 (Automotive Chassis Units) | 4 |
| MATH 124* (Technical Mathematics II) | C2 |
| **Winter or Summer Semester** | |
| AUTO 201 (Automotive Digital Electronics) | 3 |
| MDTC 160** (Mechanical Drafting and CAD I) | C4 |
| **3rd Semester** | |
| AUTO 104 (Automotive Ignition Systems) | 3 |
| AUTO 105 (Automotive Transmissions) | 3 |
| **4th Semester** | |
| AUTO 103 (Fuel and Emission Control Systems) | 4 |
| AUTO 114 (Automotive Instrumentation and Testing) | 4 |

| Additional Technology Electives | 6-7 |
|---|---|
| (All recommended for better employment opportunities.) | |
| AUTO 109 (Welding for Automotive Technicians) | 3 |
| MATL 101 (Industrial Materials) | 3 |
| MECH 102 (Manufacturing Processes) | 4 |
| MECH 103 (Machining Basics and CNC) | 4 |
| MECH 111 (Introduction to Fluid Power) | 3 |

| | |
|---|---|
| **Total Degree Requirements** | **61-62 credits** |
| **Total Degree Cost** | **80 minimum billable contact hours** |

*\* 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.*

*\*\* MDTC 160 (Mechanical Drafting and CAD I) can be replaced by CIS 130 (Introduction to Computer Information Systems).*

# Certificate Program:
# Automotive Engineering Technology

In addition to the two-year associate degree program, Monroe County Community College offers a certificate program in automotive engineering 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 |
|---|---|
| ELEC 125 (Fundamentals of Electricity) | 3 |
| AUTO 101 (Internal Combustion Engines) | 4 |
| AUTO 102 (Automotive Electricity and Electronics) | 4 |
| AUTO 103 (Fuel and Emission Control Systems) | 4 |
| AUTO 104 (Automotive Ignition Systems) | 3 |
| AUTO 105 (Automotive Transmissions) | 3 |
| AUTO 107 (Automotive Chassis Units) | 4 |
| AUTO 114 (Automotive Instrumentation and Testing) | 4 |
| AUTO 201 (Automotive Digital Electronics) | 3 |
| MATH 119 (Elementary Technical Mathematics) | 2 |

**Total Certificate Requirements**      **34 credits**
**Total Certificate Cost**      **50 minimum billable contact hours**

# AUTOMOTIVE SERVICE TECHNOLOGY

## Applied Science and Engineering Technology Division

The associate of applied science degree with specialization in automotive service technology is structured to provide the technical knowledge and mechanical abilities necessary to work on the vehicles of yesterday, today and the future. Today's vehicles are highly complex feats of engineering. Technicians need a wide array of skills and knowledge to diagnose, repair and maintain these vehicles. Automotive service technicians have the opportunity to work on hydraulic systems (brakes and transmissions), mechanical systems (engines and steering), computer systems (modules and networks) and electrical systems (entertainment and lighting).

All of these systems work together to ensure the safety and comfort drivers rely on. The automotive service technician makes use of various mechanical and electrical test instruments and gauges, including scan tools, oscilloscopes, pressure gauges, pneumatic tools and hand tools. The curriculum is planned to prepare the graduate to perform duties concerned with diagnosis, repair and maintenance of motor vehicles. Graduates of this program will be prepared for entry-level employment in the following areas:

- Dealership service technician
- Factory technical representative
- Independent service technician
- Service engineer
- Service writer

Students desiring to earn the automotive service technology program designation must complete the following general education and required core and specialized courses:

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

### Required General Education Courses — Credits 21

| | | Credits |
|---|---|---|
| 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 and CAD I) | 4 |
| C5 | Expressions of the Human Experience Competency | 3 |
| C6 | Social Systems Competency | 3 |

*MDTC 160 (Mechanical Drafting and CAD I) can be replaced by CIS 130 (Introduction to Computer Information Systems).*
*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

### Required Core Courses — Credits 37

**1st Semester**
| | Credits |
|---|---|
| AST 101 (Introduction to Automotive Service) | 3 |
| AST 102 (Electrical Systems I) | 4 |
| AST 105 (Engine Theory) | 3 |

**2nd Semester**
| | |
|---|---|
| AST 103 (Electrical Systems II) | 4 |
| AST 120 (Brake Systems) | 4 |
| AST 125 (Steering and Suspension) | 4 |

**Summer Semester**
| | |
|---|---|
| AST 130 (Heating and Air Conditioning) | 4 |

**3rd Semester**
| | |
|---|---|
| AST 202 (Engine Performance I) | 4 |
| Restricted Elective Option** | |

**4th Semester**
| | |
|---|---|
| AST 203 (Engine Performance II) | 4 |
| Restricted Elective Option** | |
| AST 249 (Work Experience) | 3 |

### Restricted Electives (choose 1)** — 5

| | |
|---|---|
| AST 205 (Engine Repair) | 5 |
| AST 210 (Manual Transmission and Driveline Repair) | 5 |
| AST 211 (Automatic Transmission Repair) | 5 |

**Total Degree Requirements** — 63 credits
**Total Degree Cost** — 87 minimum billable contact hours

*** Designates elective course (choose only one option 3rd or 4th semester). AST 210 (Manual Transmission and Driveline Repair) or AST 211 (Automatic Transmission Repair) to be offered alternatively in Fall semester of each year. AST 205 (Engine Repair) to be offered in the Winter semester.*

## Certificate Program:
## Automotive Service Technology

In addition to the two-year associate degree program, Monroe County Community College offers a certificate program in automotive service technology. The basic core subjects of automotive repair are covered in these courses. Skill development and job procurement are the primary objectives of this program, and all courses taken in this certificate program are applicable toward the associate of applied science degree.

### Required Core Courses — Credits

| | |
|---|---|
| AST 101 (Introduction to Automotive Service) | 3 |
| AST 102 (Electrical Systems I) | 4 |
| AST 120 (Brake Systems) | 4 |
| AST 103 (Electrical Systems II) | 4 |
| AST 125 (Steering and Suspension) | 4 |
| AST 130 (Heating and Air Conditioning) | 4 |

**Total Certificate Requirements** — 23 credits
**Total Certificate Cost** — 37 minimum billable contact hours

# BUSINESS MANAGEMENT

## Business Division

The associate of applied science degree in business management is designed to provide the student with a general background in business and an awareness of the organizational and environmental changes that continually challenge management.

### Career Opportunities

Graduates of this program will potentially be prepared for entry-level employment as:

- Business analysts
- Customer service representatives
- General business managers
- Human resources managers
- Office managers
- Purchasing and logistics agents
- Retail managers
- Sales managers

### Transfer Information

Although this program is a two-year occupational program designed to prepare students for employment, many four-year colleges and universities will accept much of this curriculum in transfer. Please see a counselor in the Office of Admissions and Guidance for details.

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

## Certificate Program: Entrepreneurship

| Required Core Courses | Credits |
|---|---|
| HUMAN 152 (Exploring Creativity) | 3 |
| BUSAD 170 (Small Business and Entrepreneurship) | 3 |
| MCOM 201 (Principles of Marketing) | 3 |
| BUSAD 180 (Entrepreneurship Capstone) | 3 |

| | |
|---|---|
| **Total Certificate Requirements** | **12 credits** |
| **Total Certificate Cost** | **12 minimum billable contact hours** |

The associate of applied science in business management may be completed* via the MCCC-Online Option. To learn more, contact a counselor, academic advisor, program faculty member or the Business Division dean to explore options.

*\* Not all courses are offered online every semester.*
*\* Additional online course options may be available through Michigan Colleges Online (www.micollegesonline.org).*
*\* Additional course fees may apply.*

## Associate of Applied Science: Business Management

| Required Core Courses | Credits 30 |
|---|---|
| **1st Semester** | |
| BUSAD 151 (Introduction to Business) | 4 |
| ECON 251 (Principles of Macroeconomics) | 3 |
| **2nd Semester** | |
| BMGT 201 (Principles of Management) | 3 |
| BMGT 160 (Managing in the Digital Enterprise) | 3 |
| ACCTG 151 (Accounting Principles) | 4 |
| **3rd Semester** | |
| ACCTG 152 (Accounting Principles) | 4 |
| MCOM 201 (Principles of Marketing) | 3 |
| **4th Semester** | |
| BMGT 202 (Business Communication in a Digital Age) | 3 |
| ECON 252 (Principles of Microeconomics) | 3 |

| Required Electives Options | 9 |
|---|---|

(must select from this list to complete degree requirements)

| | |
|---|---|
| ACCTG 201 (Microcomputer Accounting I) | 3 |
| ACCTG 220 (Payroll Accounting) | 3 |
| ACCTG 252 (Cost Accounting) | 4 |
| BUSAD 170 (Small Business and Entrepreneurship) | 3 |
| BUSAD 180 (Entrepreneurship Capstone) | 3 |
| BMGT 220 (International Business) | 3 |
| BMGT 251 (Human Resource Management) | 4 |
| BSLW 251 (Business Law) | 4 |
| CIS 109 (Spreadsheet Software) | 3 |
| CIS 112 (Database Software) | 3 |
| CIS 123 (Presentation Software) | 3 |
| HUMAN 152 (Exploring Creativity) | 3 |
| MATH 162 (Introduction to Statistics) | 3 |

| Required General Education Courses | Credits 16-17 |
|---|---|
| C1 Natural Science Competency* | 4 |
| C2 Mathematics Competency | 3 or 4 |
| C3 ENGL 151 (English Composition I) | 3 |
| C4 BMGT 160 (Managing in the Digital Enterprise) | C4 |
| C5 Expressions of the Human Experience Competency | 3 |
| C6 Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

| General Electives | 4-5 |
|---|---|

*(as required to meet degree requirements)*

| | |
|---|---|
| **Total Degree Requirements** | **60 credits** |
| **Total Degree Cost** | **61 minimum billable contact hours** |

# CERTIFIED NURSE AIDE

## Health Sciences Division

The nurse aide program is designed to prepare an individual to fulfill the role of direct caregiver/nursing aide. The course emphasizes the skills and behaviors that are significant to employers of nurse aides, including cardiopulmonary resuscitation (CPR).

This course includes classroom activities, skills practice time in the laboratory and supervised clinical practice at a long-term care facility. Students are expected to show competency in skills before the clinical portion of the course in order to proceed and complete the course. Upon completion of this course, students will be eligible to take the clinical and written exams required for certification as a nurse aide in the State of Michigan.

Major units include: orientation to long term care, understanding long term care and patient ethical/legal aspects of health care, fire/disaster safety, safe patient environment, communication, planning and organizing work, medical and charting terminology, activities of daily living, measuring intake and output, standard precautions, infection control, body mechanics, positioning, range of motion, lifting, transfers, ambulation, vital signs, nutrition, elimination, the reproductive system of the elderly, care of specific disorders, restorative nursing, spiritual and religious needs, and death and dying.

Being a nurse aide, as well as taking course work to become a nurse aide, requires direct care of clients and is characterized by the application of verified knowledge in the skillful performance of nurse aide duties.

## Career Opportunities

Upon completion of this course, students will be eligible to take the clinical and written exams required for certification as a nurse aide in the State of Michigan. The average CNA salary in Michigan is approximately $32,000 per year. Employment opportunities are favorable and exist in long-term care settings, acute care hospitals, in-home healthcare organizations and community settings.

## Technical Standards

The purpose of the technical standards is to inform students choosing to enter into a health occupation program of the basic minimal technical standard requirements that must be met in order to complete all course work objectives and student outcomes. The listed standards encompass what is minimally required to perform necessary tasks. This list is not exhaustive, and can be modified as the college deems necessary at any time. Students enrolled in a health occupation program at MCCC must provide care that is safe and effective. These technical standards apply to any student enrolling in any one of the health occupations programs. The student must be able to demonstrate sufficient cognitive, professional, motor (physical), sensory, and other abilities, with or without accommodation, to meet program technical standards. Technical standard requirements are listed below. Examples of tasks associated with each requirement and standard are available for review by visiting the Health Sciences Division section of the MCCC website. Prospective students are encouraged to review the Technical Standards for Health Occupational Programs document in its entirety prior to enrolling in or applying to any health occupation course or program.

- **Critical Thinking and Cognitive Competencies:** Sufficient critical thinking and cognitive abilities in classroom and clinical settings.

- **Professionalism:** Interpersonal skills sufficient for professional interaction with a diverse population of individuals, families, and groups.

- **Communication:** Communication sufficient for professional interactions.

- **Mobility:** Physical abilities sufficient for movement from room to room and in small spaces.

- **Motor Skills:** Gross and fine motor abilities which are sufficiently effective and safe for providing allied health care.

- **Sensory:** Auditory and visual ability sufficient for observing, monitoring, and assessing health needs.

- **Observation:** Ability to sufficiently make observations in a health care environment, consistent with program competencies.

- **Tactile sense:** Tactile ability sufficient for physical assessment.

A prospective student or participant in the program with an approved documented disability can request reasonable accommodations to meet these standards. The college will provide appropriate accommodations, but is not required to substantially alter the requirements or nature of the program. Requests for accommodations should be directed to a disability services counselor in the Student Success Center. To make an appointment, please call 734.384.4167.

Students must meet agency health and security requirements prior to the first clinical experience. These include:

1. Immunizations and examinations at the student's expense to ensure that the student can meet the technical requirements of the program.
2. Nurse aide students are required to have professional liability and personal health insurance. The professional liability insurance is provided by the college. Personal health insurance must be obtained by the student and maintained throughout the clinical portion of the course in order to comply with agency requirements. Proof of insurance will be required prior to participating in any clinical activity.
3. Students admitted to health science programs must consent to background/security checks including a criminal background check and drug screening. The student is responsible for any cost associated with the background/security checks. Students that require additional drug testing beyond initial screening and/or a medical review may be responsible for associated costs. Certain criminal convictions may render a student ineligible to train at clinical sites which are necessary in order to successfully complete the program. Additionally, certain criminal convictions may render an individual ineligible to take the

licensing/certification exam or to be licensed/certified in the State of Michigan. The college will review the results and determine, on a case-by-case basis, whether to deny admission to any individual based on the results of the criminal background check and drug screening.

4. An active American Heart Association cardiopulmonary resuscitation (CPR) certificate for professional rescuer of infant, child and adult.

5. In addition to the general college rules, CNA students are required to adhere to policies and procedures outlined in the Nurse Aide Student Information Handbook. Students are encouraged to review the handbook prior to enrolling in the course. A copy of the handbook is available in the CNA section of the MCCC website.

6. If a student cannot meet the health/or security requirements to be placed in the clinical setting, they will be dismissed from the course.

**Required Course**                       **Credits**
  CNA 100* (Certified Nurse Aide). . . . . . . . . . . . . . . . . . . . . . . . 6

**Total Course Requirements**          **6 credits\*\***
**Total Costs**                    **10 billable contact hours**

*\* Prerequisite: RDG 090 (Basic Reading Skills) and ENGL 090 (Basic Writing Skills) or qualifying scores on accepted placement tests. Corequisite: None*

*\*\* Hours required: Class – 48; Lab – 59; Clinical – 48*

# COMPUTER INFORMATION SYSTEMS
## ACCOUNTING/CIS

### Business Division

The associate of applied science degree with specialization in accounting/CIS has a dual focus in combining accounting and computer courses. Students completing this program of study will have entry-level skills in both career areas.

### Career Opportunities

Section 404 of the Sarbanes-Oxley Act of 2002, which requires publicly listed companies to establish and maintain internal control standards, has placed the combined skill set in accounting and systems in high demand for over a decade. This associate of applied science degree will help to provide the students with the entry level skills for a career in this combined field.

### Transfer Information

An associate degree in accounting/CIS from MCCC offers easy transfer to many of the four-year programs in Michigan and surrounding states, such as the University of Michigan, Wayne State University, Davenport University, Walsh College, University of Toledo, Siena Heights University and more. Completing the first two years at MCCC and then transferring the credits to a four-year program can result in savings of up to 75 percent of the cost compared to its equivalent at a private four-year college.

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

### All Classes Available Online

All MCCC accounting classes are available online, allowing for convenient access.

> 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** | | **19-20** |
| C1 | Natural Science Competency | 4 |
| C2 | Mathematics Competency | 3 or 4 |
| C3 | ENGL 151 (English Composition I) | 3 |
| C4 | CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5 | Expressions of the Human Experience Competency | 3 |
| C6 | Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | Credits |
|---|---|
| **Required Courses** | **42** |

**1st Semester**
| | |
|---|---|
| ACCTG 151 (Accounting Principles) | 4 |
| CIS 109 (Spreadsheet Software) | 3 |
| CIS 130 (Introduction to Computer Information Systems) | C4 |

**2nd Semester**
| | |
|---|---|
| ACCTG 152 (Accounting Principles) | 4 |
| CIS 112 (Database Software) | 3 |

**3rd Semester**
| | |
|---|---|
| ACCTG 201 (Microcomputer Accounting I) | 3 |
| ACCTG 251 (Intermediate Accounting I) | 4 |
| CIS 150 (Computer Science I) | 4 |
| CIS 205 (Systems Analysis & Design) | 3 |

**4th Semester**
| | |
|---|---|
| ACCTG 205 (Microcomputer Accounting II) | 3 |
| ACCTG 252 (Cost Accounting) | 4 |
| ACCTG 254 (Intermediate Accounting II) | 4 |

|  | Credits |
|---|---|
| **Additional Required Courses** | **3** |
| ACCTG 220 (Payroll Accounting) | 3 |

| | |
|---|---|
| **Total Degree Requirements** | **61-62 credits** |
| **Total Degree Cost** | **61-62 minimum billable contact hours** |

# COMPUTER INFORMATION SYSTEMS
## APP DEVELOPMENT

### Business Division

The associate of applied science degree with specialization in app development is designed to train students in Web and mobile app development.

**Transfer Information**

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

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

| Required General Education Courses | Credits 19-20 |
|---|---|
| C1 Natural Science Competency | 4 |
| C2 Mathematics Competency | 3 or 4 |
| C3 ENGL 151 (English Composition I) | 3 |
| C4 CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5 Expressions of the Human Experience Competency | 3 |
| C6 Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

| Required Core Courses | Credits 29 |
|---|---|
| CIS 112 (Database Software) | 3 |
| CIS 130 (Introduction to Computer Information Systems) | C4 |
| CIS 150 (Computer Science I) | 4 |
| CIS 153 (Desktop App Development) | 3 |
| CIS 183 (Mobile App Development) | 4 |
| CIS 184 (Photoshop Graphics) | 3 |
| CIS 209 (Network Concepts) | 3 |
| CIS 212 (Full Stack Development) | 3 |
| IAS 103 (Information Security Principles) | 3 |

| Additional Required CIS or IAS Courses | 3 |
|---|---|

| General Elective Courses | 11-12 |
|---|---|

*(as required to complete 60 hours)*

| **Total Degree Requirements** | **60 credits** |
|---|---|
| **Total Degree Cost** | **61 minimum billable contact hours** |

## Certificate Program: App Development

This certificate program focuses on Web and mobile app development.

| Required Courses | Credits |
|---|---|
| CIS 112 (Database Software) | 3 |
| CIS 130 (Introduction to Computer Information Systems) | 3 |
| CIS 150 (Computer Science I) | 4 |
| CIS 153 (Desktop App Development) | 3 |
| CIS 183 (Mobile App Development) | 4 |
| CIS 184 (Photoshop Graphics) | 3 |
| CIS 209 (Network Concepts) | 3 |
| CIS 212 (Full Stack Development) | 3 |
| IAS 103 (Information Security Principles) | 3 |

| **Total Certificate Requirements** | **29 credits** |
|---|---|
| **Total Certificate Cost** | **29 minimum billable contact hours** |

# COMPUTER INFORMATION SYSTEMS
## COMPUTER SCIENCE

### Business Division

The associate of applied science degree with specialization in computer science is designed to train students for the area of computer programming in an engineering/science environment.

**Career Opportunities**

- Entry-level programming positions

**Transfer Information**

MCCC has a signed transfer agreement with the University of Michigan-Dearborn that allows students to transfer directly into the bachelor of science in computer and information science, software engineering or information assurance programs. Refer to the Business Division website for specific transfer courses and requirements.

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

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** | | **20** |
| C1 | Natural Science Competency | 4 |
| C2 | MATH 171 (Calculus I) | 4 |
| C3 | ENGL 151 (English Composition I) | 3 |
| C4 | CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5 | Expressions of the Human Experience Competency | 3 |
| C6 | Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

| | **Credits** |
|---|---|
| **Required Core Courses** | **29** |
| CIS 130 (Introduction to Computer Information Systems) | C4 |
| CIS 150 (Computer Science I) | 4 |
| CIS 153 (Desktop App Development) | 3 |
| CIS 167 (Discrete Structures) | 4 |
| CIS 183 (Mobile App Development) | 4 |
| CIS 212 (Full Stack Development) | 3 |
| CIS 250 (Computer Science II) | 4 |
| CIS 267 (Beginning Game Programming) | 3 |
| CIS 268 (Assembly Language and Computer Architecture) | 4 |

| | |
|---|---|
| **Additional CIS or IAS Electives** | **6** |

| | |
|---|---|
| **General Electives Courses** | **6** |

*(as required to complete 60 hours)*

| | |
|---|---|
| **Total Degree Requirements** | **61 credits** |
| **Total Degree Cost** | **61 minimum billable contact hours** |

# COMPUTER INFORMATION SYSTEMS
## CYBERSECURITY AND INFORMATION ASSURANCE

### Business Division

The associate of applied science degree in computer information systems with a program designation of cybersecurity and information assurance is designed to provide an opportunity for students to acquire the foundational skills needed for an entry-level position supporting corporate security operations. The term "information assurance" encompasses the scientific, technical and management disciplines required to ensure computer and network security.

### Career Opportunities

Graduates of this program will potentially be prepared for entry-level employment as:

- Computer emergency response team operations
- Computer forensics
- Cyber crime investigation
- Cryptography
- Defensive information operations
- Information assurance systems and product acquisition
- Information assurance training education and management
- Systems/network administration and operation
- Threat and vulnerability assessment (includes risk management)
- Threat intelligence
- Web security

For more information, please see the following link on the Bureau of Labor Statistics website: http://www.bls.gov/ooh/computer-and-information-technology/information-security-analysts.htm.

### Transfer Information

This program was designed to transfer to institutions offering four-year degrees. There is a significant financial advantage in following this path. Monroe County Community College and Eastern Michigan University have an articulation agreement that will maximize transferability. For more information, go to https://www.emich.edu/ccr/documents/currguidenew/monroe/monroe_informationassurance.pdf?v=2018-05-08T16:36:24Z.

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

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

| Required General Education Courses | Credits 19-20 |
|---|---|
| C1 Natural Science Competency | 4 |
| C2 Mathematics Competency* | 3-4 |
| C3 ENGL 151 (English Composition I) | 3 |
| C4 CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5 Expressions of the Human Experience Competency | 3 |
| C6 Social Systems Competency | 3 |

*MATH 126 (Mathematics for Business) is recommended for students whose goal is to complete the AAS degree and seek employment. MATH 151 (Intermediate Algebra) or higher is recommended for students interested in transferring.*

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

| Required CIS Core Courses | Credits 9 |
|---|---|
| CIS 130 (Introduction to Computer Information Systems) | C4 |
| CIS 208 (PC Operating Systems) | 3 |
| CIS 209 (Network Concepts) | 3 |
| IAS 103 (Information Security Principles) | 3 |

| Cybersecurity Concentration | Credits 19 |
|---|---|
| CIS 150 (Computer Science I) | 4 |
| CIS 228 (Linux Administration) | 3 |
| CIS 230 (Windows Server) | 3 |
| IAS 202 (Risk Vulnerability Analysis) | 3 |
| IAS 210 (Advanced Networking Practices) | 3 |
| IAS 213 (Privacy and Technology) | 3 |

| Additional General Electives | 12-13 |
|---|---|
| *(as required to complete 60 hours)* | |

| | |
|---|---|
| **Total Degree Requirements** | **60 credits** |
| **Total Degree Cost** | **61 minimum billable contact hours** |

## Certificate Program:
## Cybersecurity and Information Assurance

| Required Courses | Credits |
|---|---|
| CIS 130 (Introduction to Computer Information Systems) | 3 |
| CIS 208 (PC Operating Systems) | 3 |
| CIS 209 (Network Concepts) | 3 |
| CIS 230 (Windows Server) | 3 |
| IAS 103 (Information Security Principles) | 3 |
| IAS 202 (Risk Vulnerability Analysis) | 3 |
| IAS 210 (Advanced Networking Practices) | 3 |
| IAS 213 (Privacy and Technology) | 3 |

| | |
|---|---|
| **Total Certificate Requirements** | **24 credits** |

# COMPUTER INFORMATION SYSTEMS
## OFFICE PROFESSIONAL

### Business Division

The associate of applied science degree with specialization as a computer information systems office professional is designed to provide comprehensive preparation for office employment. The curriculum emphasizes communication skills as well as office applications software usage. Graduates of this program will be prepared for entry-level employment in corporate offices, law firms, medical offices, the hospitality industry, educational administrative offices, and administrative departments of state or local governments.

#### Career Opportunities

Graduates of this program will potentially be prepared for entry-level employment as:
- Administrative coordinators
- Administrative specialists
- Executive administrative assistants
- Office administrators
- Customer support specialists
- Office managers

Basic keyboarding abilities and proper "touch typing" skills are required to be successful in these programs.

| Required General Education Courses | Credits 19-20 |
|---|---|
| C1 Natural Science Competency | 4 |
| C2 Mathematics Competency* | 3 or 4 |
| C3 ENGL 151 (English Composition I) | 3 |
| C4 CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5 Expressions of the Human Experience Competency | 3 |
| C6 Social Systems Competency | 3 |

*MATH 126 (Mathematics for Business) is recommended for students whose goal is to complete the AAS degree and seek employment. MATH 151 (Intermediate Algebra) or higher is recommended for students interested in transferring.*

| Required CIS Core Courses | 35 |
|---|---|
| ACCTG 151 (Accounting Principles) | 4 |
| BMGT 202 (Business Communication in a Digital Age) | 3 |
| BUSAD 151 (Introduction to Business) | 4 |
| CIS 109 (Spreadsheet Software) | 3 |
| CIS 112 (Database Software) | 3 |
| CIS 123 (Presentation Software) | 3 |
| CIS 130 (Introduction to Computer Information Systems) | C4 |
| CIS 184 (Photoshop Graphics) | 3 |
| CIS 188 (InDesign Desktop Publishing) | 3 |
| IAS 105 (Computing and Social Responsibility) | 3 |
| WPR 102 (Word Processing I) | 3 |
| WPR 103 (Advanced Word Processing) | 3 |

#### Additional General Electives
(*as required to complete 60 credits*)

**Total Degree Requirements**     **60 credits**
**Total Degree Cost**     **60 minimum billable contact hours**

### Certificate Program: Office Specialist

In addition to the associate degree with the Computer Information Systems Office Professional designation, Monroe County Community College offers a certificate program in computer information systems office specialist. The college recognizes that many employers place value on a certificate which authenticates specialized preparation. Courses taken under the certificate programs are applicable to the associate degree. Those who complete this certificate program will typically be prepared for entry-level employment as administrative coordinators, receptionists, data entry specialists, administrative specialists, executive administrative assistants, office administrators, customer support specialists and office managers.

The CIS office specialist certificate will help prepare a student to sit for MOS (Microsoft Office Specialist) certification tests. Upon successful completion of MOS certifications, specialist positions may be available in IT business application, office support, office services, IT field technician services and customer service. This certificate program focuses on knowledge and skills that are essential for today's computer technicians.

Basic keyboarding abilities and proper "touch typing" skills are required to be successful in these programs.

| Required Courses | Credits |
|---|---|
| CIS 109 (Spreadsheet Software) | 3 |
| CIS 112 (Database Software) | 3 |
| CIS 123 (Presentation Software) | 3 |
| CIS 130 (Introduction to Computer Information Systems) | 3 |
| CIS 184 (Photoshop Graphics) | 3 |
| CIS 188 (InDesign Desktop Publishing) | 3 |
| ENGL 102 (Business Writing) or ENGL 151 (English Composition I) | 3 |
| IAS 105 (Computing and Social Responsibility) | 3 |
| WPR 102 (Word Processing I) | 3 |
| WPR 103 (Advanced Word Processing) | 3 |

**Total Certificate Requirements**     **30 credits**
**Total Certificate Cost**     **30 minimum billable contact hours**

### Certificate Program: Office Software Specialist (Microsoft Office Certification Prep)

MCCC also offers an office software speciailst certificate program that conisists of five courses and 15 credit hours.

| Required Courses | Credits |
|---|---|
| CIS 109 (Spreadsheet Software) | 3 |
| CIS 112 (Database Software) | 3 |
| CIS 123 (Presentation Software) | 3 |
| WPR 102 (Word Processing I) | 3 |
| WPR 103 (Advanced Word Processing) | 3 |

**Total Certificate Requirements**     **15 credits**
**Total Certificate Cost**     **15 minimum billable contact hours**

# COMPUTER INFORMATION SYSTEMS
## PC SUPPORT TECHNICIAN

### Business Division

The associate of applied science degree with specialization as a PC support technician is designed to train students in PC hardware maintenance and various PC operating systems.

### Career Opportunities

Graduates of this program will potentially be prepared for entry-level employment as:

- Computer support specialists
- Computer user support specialists
- Hardware support specialists
- Network support specialists
- Software support specialists

For more information, please see the following link on the Bureau of Labor Statistics website: http://www.bls.gov/ooh/computer-and-information-technology/computer-support-specialists.htm.

### Transfer Information

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

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

| | Required General Education Courses | Credits 19-20 |
|---|---|---|
| C1 | Natural Science Competency | 4 |
| C2 | Mathematics Competency* | 3 or 4 |
| C3 | ENGL 151 (English Composition I) | 3 |
| C4 | CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5 | Expressions of the Human Experience Competency | 3 |
| C6 | Social Systems Competency | 3 |

*MATH 126 (Mathematics for Business) is recommended for students whose goal is to complete the AAS degree and seek employment. MATH 151 (Intermediate Algebra) or higher is recommended for students interested in transferring.*

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

| Required CIS Core Courses | Credits 13 |
|---|---|
| CIS 130 (Introduction to Computer Information Systems) | C4 |
| CIS 208 (PC Operating Systems) | 3 |
| CIS 209 (Network Concepts) | 3 |
| CIS 220 (Hardware Maintenance) | 4 |
| IAS 103 (Information Security Principles) | 3 |

| PC Support Technician Concentration | Credits 18-19 |
|---|---|
| CIS 109 (Spreadsheet Software) | 3 |
| CIS 135** (Scripting Language Programming) or CIS 150 (Computer Science I) | 3-4 |
| CIS 140 (Help Desk Concepts) | 3 |
| CIS 205 (Systems Analysis & Design) | 3 |
| ELEC 125 (Fundamentals of Electricity) | 3 |
| IAS 105 (Computing and Social Responsibility) | 3 |

*** CIS 135 (Scripting Language Programming) is recommended for students whose goal is to complete the AAS degree and seek employment. CIS 150 (Computer Science I) or higher is recommended for students interested in transferring.*

| General Electives Courses | Credits 8-10 |
|---|---|
| *(as required to complete 60 hours)* | |

| Total Degree Requirements | 60 credits |
|---|---|
| Total Degree Cost | 61 minimum billable contact hours |

## Certificate Program: PC Support Technician

This certificate program focuses on knowledge and skills that are essential for today's computer technicians.

| Required Courses | Credits |
|---|---|
| CIS 130 (Introduction to Computer Information Systems) | 3 |
| CIS 135 (Scripting Language Programming) or CIS 150 (Computer Science I) | 3-4 |
| CIS 140 (Help Desk Concepts) | 3 |
| CIS 208 (PC Operating Systems) | 3 |
| CIS 209 (Network Concepts) | 3 |
| CIS 220 (Hardware Maintenance) | 4 |
| IAS 103 (Information Security Principles) | 3 |
| IAS 105 (Computing and Social Responsibility) | 3 |

| Total Certificate Requirements | 25-26 credits |
|---|---|
| Total Certificate Cost | 25-26 minimum billable contact hours |

# COMPUTER INFORMATION SYSTEMS
## SYSTEM ADMINISTRATION SPECIALIST

### Business Division

The associate of applied science degree with specialization as a system administration specialist is designed to train students in LAN, Windows Server networking, hardware maintenance, data communication concepts, various PC operating systems and administration fundamentals.

### Career Opportunities

Graduates of this program will potentially be prepared for entry-level employment as:

- Computer system administrators
- Network administrators
- Network operating system specialists
- System/software administrators

For more information, please see the following link on the Bureau of Labor Statistics website: http://www.bls.gov/ooh/computer-and-information-technology/network-and-computer-systems-administrators.htm.

### Transfer Information

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

> 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

| Required General Education Courses | Credits 19-20 |
|---|---|
| C1 Natural Science Competency | 4 |
| C2 Mathematics Competency* | 3 or 4 |
| C3 ENGL 151 (English Composition I) | 3 |
| C4 CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5 Expressions of the Human Experience Competency | 3 |
| C6 Social Systems Competency | 3 |

*\* MATH 126 (Mathematics for Business) is recommended for students whose goal is to complete the AAS degree and seek employment. MATH 151 (Intermediate Algebra) or higher is recommended for students interested in transferring.*

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

| Required Core Courses | Credits 13 |
|---|---|
| CIS 130 (Introduction to Computer Information Systems) | C4 |
| CIS 208 (PC Operating Systems) | 3 |
| CIS 209 (Network Concepts) | 3 |
| CIS 220 (Hardware Maintenance) | 4 |
| IAS 103 (Information Security Principles) | 3 |

| System Administration Concentration | Credits 19-20 |
|---|---|
| CIS 135 (Scripting Language Programming) or CIS 150** (Computer Science I) | 3-4 |
| CIS 140 (Help Desk Concepts) | 3 |
| CIS 205 (Systems Analysis & Design) | 3 |
| CIS 228 (Linux Administration) | 3 |
| CIS 230 (Windows Server) | 3 |
| CIS 234 (Advanced Windows Server) | 4 |

| General Electives Courses | 7-9 |
|---|---|

*(as required to complete 60 hours)*

| Total Degree Requirements | 60 credits |
|---|---|
| Total Degree Cost | 61 minimum billable contact hours |

## Certificate Program:
## System Administration Specialist

This certificate program focuses on knowledge and skills that are essential for those specializing in network software.

| Required Courses | Credits |
|---|---|
| CIS 130 (Introduction to Computer Information Systems) | 3 |
| CIS 135 (Scripting Language Programming or CIS 150** (Computer Science I) | 3-4 |
| CIS 208 (PC Operating Systems) | 3 |
| CIS 209 (Network Concepts) | 3 |
| CIS 228 (Linux Administration) | 3 |
| CIS 230 (Windows Server) | 3 |
| CIS 234 (Advanced Windows Server) | 4 |
| IAS 103 (Information Security Principles) | 3 |

*\*\* CIS 135 (Scripting Language Programming) is recommended for students whose goal is to complete the AAS degree and seek employment. CIS 150 (Computer Science I) or higher is recommended for students interested in transferring.*

| Total Certificate Requirements | 25-26 credits |
|---|---|
| Total Certificate Cost | 25 minimum billable contact hours |

# CONSTRUCTION MANAGEMENT TECHNOLOGY

## Applied Science and Engineering Technology Division

The associate of applied science degree with specialization in construction management technology is designed to provide individuals with a sound background for rewarding careers in the construction industry. The program is structured to provide training in both the technical and business components of this industry. Technical courses examine the materials, processes and systems used in construction. The business courses teach basic business practices and computer skills.

### Career Opportunities

The program will be valuable for students seeking entry-level positions, as well as individuals who are currently in the construction field seeking to enhance their employment opportunities. Graduates of the program will have sufficient knowledge of the construction process to make a valuable contribution in both the field and office environment.

They will be prepared for entry-level employment in the following areas:

- Architectural drafter
- Assistant construction superintendent
- Construction inspector
- Construction supervisor
- Estimators
- Land planning technician/Surveying technician
- Materials sales engineer
- Quality control technician
- Specifications writer trainee
- Structural engineering technician

### Transfer Information

Although this program is a two-year occupational program designed to prepare students for employment, four-year colleges and universities may accept much of this curriculum in transfer. Construction management students who wish to pursue the 3+1 transfer program to Eastern Michigan University are advised to meet with a program faculty member for alternate course selections before registering for classes.

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

> 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 and CAD I) . . . . . . . . . . . . . . . 4 |
| C5 | Expressions of the Human Experience Competency . . . . . . . . . . . 3 |
| C6 | Social Systems Competency . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | Credits |
|---|---|
| **Required Core Courses** | **45** |

**1st Semester**
MATH 119* (Elementary Technical Mathematics). . . . . . . . . . . . . . . . . . 2
CONM 100 (Introduction to Design and Construction) . . . . . . . . . . . . . . 3
CONM 101 (Materials of Construction). . . . . . . . . . . . . . . . . . . . . . . . . . 3
MDTC 160 (Mechanical Drafting & CAD I) . . . . . . . . . . . . . . . . . . . . . .C4

**2nd Semester**
CONM 102 (Construction Practices) . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CONM 103 (Auto CAD and Residence Drafting) . . . . . . . . . . . . . . . . . . 4
CONM 110 (Construction Blueprint Reading). . . . . . . . . . . . . . . . . . . . . 3
MATH 124* (Technical Mathematics II). . . . . . . . . . . . . . . . . . . . . . . . .C2

**Summer Semester**
CONM 107 (Surveying) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

**3rd Semester**
CONM 160 (Green Building and LEED® Rating System) . . . . . . . . . . . . 3
METC 220 (Statics & Strength of Materials). . . . . . . . . . . . . . . . . . . . . . 4
CONM 202 (Construction Safety). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CONM 242 (Construction Documents and Law)
   or ELEC 156 (Introduction to Renewable Energy Systems)
   or BMGT 201 (Principles of Management) . . . . . . . . . . . . . . . . . . . . . 3

**4th Semester**
CONM 105 (Mechanical Building Systems) . . . . . . . . . . . . . . . . . . . . . . 4
CONM 240 (Construction Planning and Scheduling with
          Primavera) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ACCT 151 (Accounting Principles) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4

| | |
|---|---|
| **Total Degree Requirements** | **66 credits** |
| **Total Degree Cost** | **81-82 minimum billable contact hours** |

*\* 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: Construction Management Technology

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

## Option 1: Residential and Light Commercial Construction

The residential and light commercial construction certificate is for students who have limited construction background. The courses develop the basic skills necessary to gain entry-level employment with residential and light commercial contractors.

|  | Credits |
|---|---|
| CONM 100 (Introduction to Design and Construction) | 3 |
| CONM 101 (Materials of Construction) | 3 |
| CONM 102 (Construction Practices) | 3 |
| CONM 103 (AutoCAD and Residence Drafting) | 4 |
| CONM 105 (Mechanical Building Systems) | 4 |
| CONM 107 (Surveying) | 3 |
| CONM 110 (Construction Blueprint Reading) | 3 |
| CONM 202 (Construction Safety) | 3 |
| MDTC 160 (Mechanical Drafting & CAD I) | 4 |

**Total Certificate Requirements**      **30 credits**

**Total Certificate Cost**      **41 minimum billable contact hours**

## Option 2: Heavy and Industrial Construction

The heavy and industrial construction certificate is designed for more experienced construction personnel who wish to upgrade skills to gain management positions with large industrial employers.

|  | Credits |
|---|---|
| CONM 110 (Construction Blueprint Reading) | 3 |
| CONM 202 (Construction Safety) | 3 |
| CONM 240 (Construction Planning & Scheduling with Primavera) | 3 |
| CONM 242 (Construction Documents & Law) | 3 |
| CONM 244 (Construction Estimating) | 3 |
| CONM 107 (Surveying) | 3 |
| MDTC 160 (Mechanical Drafting & CAD I) | 4 |

**Total Certificate Requirements**      **22 credits**

**Total Certificate Cost**      **26 minimum billable contact hours**

# CRIMINAL JUSTICE/LAW ENFORCEMENT

## Humanities/Social Sciences Division

### Criminal Justice

This associate of applied science program prepares students for employment in criminal justice positions that require an associate degree or transfer to baccalaureate programs in criminal justice. Students planning to transfer should consult both their Monroe County Community College advisor and the transfer school for assistance in selecting appropriate electives.

### Law Enforcement

This associate of applied science program prepares students for employment in law enforcement positions requiring both an associate degree and Michigan Commission on Law Enforcement Standards (MCOLES) certification (www.michigan.gov/mcoles). MCCC students may take the Police Academy at any MCOLES approved academy Please contact the instructor of criminal justice at 734.384.4297 or danielwood@monroeccc.edu.

> 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**                       | **19-20** |
| C1  Natural Science Competency                               | 4 |
| C2  Mathematics Competency                                   | 3-4 |
| C3  ENGL 151 (English Composition I)                         | 3 |
| C4  CIS 130 (Introduction to Computer Information Systems)   | 3 |
| C5  Human Experience Competency                              | 3 |
| C6  SOC 151 (Principles of Sociology)                        | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|                                                              | Credits |
|--------------------------------------------------------------|---------|
| **Required Core Courses**                                    | **27** |
| CRJ 151 (Introduction to Criminal Justice)                   | 3 |
| SPCH 151 (Communication Fundamentals)                        | 3 |
| ENGL 155 (Technical Writing)                                 | |
|    or ENGL 152 (English Composition II)       | 3 |
| PSYCH 151 (General Psychology)                               | 3 |
| CRJ 170 (Introduction to Corrections)                        | 3 |
| CRJ 160 (Issues in Criminal Justice Ethics)                  | |
|    or CRJ 156 (Fundamentals of Criminal Investigation) | 3 |
| CRJ 251 (Criminal Law)                                       | 3 |
| CRJ 252 (Juvenile Delinquency)                               | 3 |
| CRJ 256 (Police Operations)                                  | 3 |

| **Criminal Justice Option**                                  | **15 Credits** |
|--------------------------------------------------------------|---------|
| SOC 251 (Modern Social Problems)                             | 3 |
| PSYCH 152 (Psychology of Personality & Adjustment)           | 3 |
| PSYCH 253 (Social Problems)                                  | 3 |
| SPCH 155 (Interpersonal Communication)                       | 3 |
| Additional Restricted Elective (course not previously taken) | 3 |
|    CRJ 160 (Issues in Criminal Justice Ethics) | |
|    CRJ 156 (Fundamentals of Criminal Investigation) | |
|    CRJ 255 (Police Organization and Administration) | |

| **Total Degree Requirements** | **61-62 credits** |
|---|---|
| **Total Degree Cost** | **61 minimum billable contact hours** |

| **Law Enforcement Option**                                   | **17 Credits** |
|--------------------------------------------------------------|---------|
| Police Academy                                               | 17 |
| MCCC accepts police academy transferable credits from any MCOLES licensure. | |

| **Total Degree Requirements** | **63-64 credits** |
|---|---|
| **Total Degree Cost** | **63 minimum billable contact hours** |

## Certificate Program: Criminal Justice

In addition to the two-year associate degree program, Monroe County Community College offers a certificate program in criminal justice. We recognize that many employers place value on a certificate which authenticates specialized education preparation. The program concentrates upon basic core courses with objectives. All courses taken in the certificate program are applicable towards the associate of applied science degree in criminal justice or law enforcement.

|                                                              | Credits |
|--------------------------------------------------------------|---------|
| CRJ 151 (Introduction to Criminal Justice)                   | 3 |
| CRJ 170 (Introduction to Corrections)                        | 3 |
| CRJ 252 (Juvenile Delinquency)                               | 3 |
| ENGL 151 (English Composition I)                             | C3 |
| SOC 151 (Principles of Sociology)                            | C6 |
| SOC 251 (Modern Social Problems)                             | 3 |

| **Total Certificate Requirements** | **18 credits** |
|---|---|
| **Total Certificate Cost** | **18 minimum billable contact hours** |

# EARLY CHILDHOOD EDUCATION

## Science/Mathematics Division

The early childhood education associate of applied science degree program prepares students to provide high-quality care and education of young children birth through age 8. The mission of the early childhood education program at Monroe County Community College is to prepare students for employment in the early childhood education field and for articulation to advanced degree programs in early childhood education. This is accomplished through the provision of classroom learning and practical application in field experiences. These experiences will be provided in multiple settings across varied age ranges and diversity of children and families.

## Career Opportunities

The program prepares individuals for staff placement in:

- Child care centers
- Family child care
- Head Start programs
- Great Start Readiness Program preschools
- Preschools
- Public school latchkey programs
- Other programs involved in the care and guidance of children and their families

## Associate Degree Program:

> 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** |  | **19-20** |
| C1 | Natural Science Competency | 4 |
| C2 | MATH 126 (Mathematics for Business) or MATH 151 (Intermediate Algebra) or higher or competency | 3 or 4 |
| C3 | ENGL 151 (English Composition I) | 3 |
| C4 | Computer Literacy Competency | 3 |
| C5 | ENGL 256 (Children's Literature) | 3 |
| C6 | PSYCH 151 (General Psychology) | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | Credits |
|---|---|
| **Required Core Courses\*** | **40** |

**Fall Semester (First Year)**
| | |
|---|---|
| ECE 100 (Foundations of Early Childhood Education) | 3 |
| ECE 102 (Child Growth and Development) | 3 |
| ECE 104 (Nutrition, Health and Safety for Early Childhood Education) | 3 |

**Winter Semester (First Year)**
| | |
|---|---|
| ECE 106 (Observation and Assessment of Child Development) | 3 |
| ECE 108 (The Care and Learning of Infants and Toddlers) | 4 |
| ECE 110 (Diverse Populations in Early Childhood Education) | 3 |

**Fall Semester (Second Year)**
| | |
|---|---|
| ECE 200 (The Care and Learning of Preschool Children) | 4 |
| ECE 202 (The Care and Learning of School-Age Children) | 4 |

**Winter Semester (Second Year)**
| | |
|---|---|
| ECE 206 (Early Childhood Education Practicum) | 5 |

*\* Students must achieve a grade of C or higher in all ECE courses to proceed in the program.*

## Additional Required Courses

| | |
|---|---|
| EDUC 158 (Art for Elementary Teachers) or EDUC 165 (Music for Classroom Teachers) | 3 |
| HPE 151 (First Aid and Safety) | 2 |
| PSYCH 251 (Child Psychology) | 3 |

## Additional General Electives

*(If needed to complete required total credit hours)*

Suggested Elective Courses
| | |
|---|---|
| ECE 204 (Administration of a Child Care Program) | 3 |
| EDUC 151 (Exploring Teaching) | 3 |
| ENGL 102 (Business Writing) | 3 |
| ENGL 152 (English Composition II) | 3 |
| PSYCH 254 (Life Span Psychology) | 3 |
| SOC 152 (Marriage and Family) | 3 |
| SPCH 151 (Communication Fundamentals) | 3 |
| SWK 106 (Child Welfare) | 3 |
| SWK 151 (Introduction to Social Services) | 3 |

| | |
|---|---|
| **Total Degree Requirements** | **60 credits** |
| **Total Degree Cost** | **65 minimum billable contact hours** |

# Certificate Program: Early Childhood Education

The early childhood education certificate program is designed for students who will work with and teach young children. Students may use this curriculum to meet state licensing requirements to provide child care in homes, centers and other facilities or for positions as assistant teachers in child care programs. A minimum of 32 credit hours is required for the early childhood education certificate. Courses for the certificate can be applied toward the associate degree.

| Required Courses* | Credits |
|---|---|
| ECE 100 (Foundations of Early Childhood Education) | 3 |
| ECE 102 (Child Growth and Development) | 3 |
| ECE 104 (Nutrition, Health and Safety for Early Childhood Education) | 3 |
| ECE 106 (Observation and Assessment of Child Development) | 3 |
| ECE 108 (The Care and Learning of Infants and Toddlers) | 4 |
| ECE 110 (Diverse Populations in Early Childhood Education) | 3 |
| ECE 200 (The Care and Learning of Preschool Children) | 4 |
| ECE 202 (The Care and Learning of School-Age Children) | 4 |
| HPE 151 (First Aid and Safety) | 2 |

*Students must achieve a C or higher in all ECE courses to complete the certificate program.*

| One of the following courses | 3 |
|---|---|
| EDUC 158 (Art for Elementary Teachers) | |
| EDUC 165 (Music for Classroom Teachers) | |
| ENGL 256 (Children's Literature) | |

| | |
|---|---|
| **Total Certificate Requirements** | **32 credits** |
| **Total Certificate Cost** | **32 minimum billable contact hours** |

# CDA Credential

The Child Development Associate (CDA) is a national credential earned by individuals working with young children birth to five years in child care settings. The CDA credential is based on a core set of competency standards, which guide early care professionals as they work to becoming qualified teachers of young children. The candidate must document 120 clock-hours of formal training through course work, 480 clock-hours of current experience working with young children, and complete documentation as required by the Council for Professional Recognition. MCCC courses provide the training required for the CDA and may be applied toward the associate degree or certificate programs. Please note that MCCC does not award the CDA credential. See the Council for Professional Recognition website for more information (www.cdacouncil.org).

| | Credits |
|---|---|
| **Infant/Toddler CDA Credential coursework:** | |
| ECE 102 (Child Growth and Development) | 3 |
| ECE 104 (Nutrition, Health and Safety for Early Childhood Education) | 3 |
| ECE 108 (The Care and Learning of Infants and Toddlers) | 4 |
| **Preschool CDA Credential coursework:** | |
| ECE 102 (Child Growth and Development) | 3 |
| ECE 104 (Nutrition, Health and Safety for Early Childhood Education) | 3 |
| ECE 200 (The Care and Learning of Preschool Children) | 4 |

# ELECTRICAL ENGINEERING TECHNOLOGY

## Applied Science and Engineering Technology Division

The associate of applied science degree with specialization in electrical engineering technology is designed to provide the theory and application of principles, procedures and components that technicians encounter in modern industrial environments. Graduates typically find employment as industrial electricians, engineering aides, laboratory technicians and field service representatives. Electrical apprentices will find this program to be an attractive way to utilize the credits they have earned while pursuing their journeyman status to complete an associate of applied science degree. Many graduates transfer to nearby universities that offer a bachelor of engineering technology degree or bachelor of applied science degree on a "2+2" basis - two years at the community college and two years at the university. These graduates generally obtain engineering positions and often advance into management.

### Career Opportunities

The program provides a solid foundation in general electricity/electronics. Throughout, the program maintains a commitment of "hands-on" laboratory applications to support and reinforce theoretical discussions of circuits. To this end, the Electrical-Electronics Troubleshooting course includes the construction of a finished electronic power supply that students may keep at their option.

Graduates of this program will be prepared for entry-level employment in the following areas:

- Automated systems technician
- Computer maintenance technician
- Electrical designer
- Electromechanical technician
- Electronic systems test technician
- Electronics technician
- Engineering aide
- Field service technician
- Industrial electrician
- Industrial sales technician

### Transfer Information

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

> 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** |

| | | Credits |
| --- | --- | --- |
| C1 | PHY 151 (General Physics) | 4 |
| C2 | MATH 151 (Intermediate Algebra) or higher | 4 |
| C3 | ENGL 151 (English Composition I) | 3 |
| C4 | MDTC 160 (Mechanical Drafting and CAD I) | 4 |
| C5 | Expressions of the Human Experience Competency | 3 |
| C6 | Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | Credits |
| --- | --- |
| **Required Core Courses** | **66** |

**Fall Semester**

| | |
| --- | --- |
| ELEC 125 (Fundamentals of Electricity) | 3 |
| MDTC 160 (Mechanical Drafting and CAD I) | 4 (C4) |
| MECH 131 (Introduction to Automated Manufacturing) | 3 |
| [1]MATH 151 (Intermediate Algebra) or higher | 4 (C2) |

**Winter Semester**

| | |
| --- | --- |
| ELEC 132 (Electronics I) | 4 |
| ELEC 135 (Digital Electronics) | 4 |
| ELEC 145 (Data Acquisition and Instrumentation) | 4 |
| PHY 151 (General Physics I) | 4 (C1) |

**Summer Semester**

| | |
| --- | --- |
| ENGL 151 (English Composition I) | 3 (C3) |
| [2]Expressions of the Human Experience or [3]Social Systems Competency | 3 (C5 or C6) |
| (See [4]Note below) | |

**Fall Semester**

| | |
| --- | --- |
| ELEC 129 (AC/DC Motors and Controls) | 4 |
| ELEC 130 (Programmable Logic Controllers-PLC's) | 3 |
| ELEC 133 (Circuit Analysis) | 4 |
| ELEC 137 (Microprocessors) | 4 |

**Winter Semester**

| | |
| --- | --- |
| ELEC 141 (Industrial Automation and Process Control) | 3 |
| ELEC 200 (Electronic and Electrical Troubleshooting) | 4 |
| ELEC 211 (Medium Voltage Power Distribution) | 3 |
| ELEC 214 (National Electric Code – NEC) | 2 |
| [2]Expressions of the Human Experience or [3]Social Systems Competency | 3 (C5 or C6) |

| | |
| --- | --- |
| **Total Degree Requirements** | **66 credits** |
| **Total Degree Cost** | **88 minimum billable contact hours** |

[1]*Students planning on transferring to an engineering technology program at a four-year institution should refer to the receiving institution's requirements for math.*

[2]*HUMAN 151 (Introduction to Humanities) (recommended) or any (C5) GE Human Experience Competency (Note: See General Education Requirements on Page 30 or the college website for a list of courses that satisfy the GE Learning Competencies).*

[3]*ANTHR 152 (Introduction to Cultural Anthropology) (recommended) or any (C6) GE Social Systems Competency (Note: See General Education Requirements on Page 30 or the college website for a list of courses that satisfy the GE Learning Competencies).*

[4]*SPCH 151 (Communication Fundamentals), 3 credit hours, although not required, is highly recommended.*

# FINE ARTS

## Humanities/Social Sciences Division

The associate of fine arts degree with specialization in fine arts is designed to provide the student with an excellent foundation upon which to build a profession or an avocation. In addition to completion of the required general education courses, students desiring the program designation on their transcript must complete the required core and specialized courses.

> 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** | | **19-20** |
| C1 | Natural Science Competency . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 4 |
| C2 | Mathematics Competency . . . . . . . . . . . . . . . . . . . . . . . . . . . | 3 or 4 |
| C3 | ENGL 151 (English Composition I) . . . . . . . . . . . . . . . . . . . . . . . . . | 3 |
| C4 | Computer Literacy Competency . . . . . . . . . . . . . . . . . . . . . . . . . . | 3 |
| C5 | Expressions of the Human Experience Competency. . . . . . . . . . . . | 3 |
| C6 | Social Systems Competency . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | Credits |
|---|---|
| **Required Core Courses** | **42** |

**1st Semester**
ART 151 (Art Fundamentals) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 180 (Drawing I) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 280 (Art History: Prehistoric to Gothic)
   or ART 281 (Art History: Renaissance to Baroque)
   or ART 282 (Art History: Neo-classic to Modern) . . . . . . . . . . . . . . . . 3
ENGL 151 (English Composition I) . . . . . . . . . . . . . . . . . . . . . . . . . . . . C3

**2nd Semester**
ART 181 (Drawing II) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ENGL 152 (English Composition II) . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
HUMAN 152 (Exploring Creativity) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
Social Science Elective. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

**3rd Semester**
ART 160 (2-D Design) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 165 (Illustration Techniques). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 270 (Ceramics I) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 190 (Painting I)
   or ART 250 (Watercolor Painting I) . . . . . . . . . . . . . . . . . . . . . . . . . . 3

**4th Semester**
ART 170 (Life Drawing) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 191 (Painting II)
   or ART 251 (Watercolor Painting II) . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 271 (Ceramics II) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 280 (Art History: Prehistoric to Gothic)
   or ART 281 (Art History: Renaissance to Baroque)
   or ART 282 (Art History: Neo-classic to Modern) . . . . . . . . . . . . . . . . C5

## General Electives
*(as required to complete 60 hours)*

| | |
|---|---|
| **Total Degree Requirements** | **61-62 credits** |
| **Total Degree Cost** | **82 minimum billable contact hours** |

# GAME DESIGN AND DEVELOPMENT

## Business Division

This associate of applied science degree will provide students with the foundational skills for game design and development.

## Career Opportunities

Graduates of this program will be prepared for entry-level employment in the following areas:

- Level designer
- Game programmer
- Asset developer
- Independent game developer

|  | Credits |
|---|---|
| **Required General Education Courses** | **20** |
| C1 Natural Science Competency | 4 |
| C2 MATH 171 (Calculus I) | 4 |
| C3 ENGL 151 (Composition I) | 3 |
| C4 CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5 Human Experience Competency | 3 |
| C6 Social Systems Competency | 3 |

|  | Credits |
|---|---|
| **Required Core Courses** | **38** |
| IAS 103 (Information Security Principles) | 3 |
| CIS 130 (Introduction to Computer Information Systems) | C4 |
| CIS 150 (Computer Science I) | 4 |
| CIS 178 (Design Concepts) | 4 |
| CIS 183 (Mobile App Development) | 4 |
| CIS 184 (Photoshop Graphics) | 3 |
| CIS 189 (3D Animation) | 3 |
| CIS 250 (Computer Science II) | 4 |
| CIS 267 (Beginning Game Programming) | 3 |
| CIS 277 (User Interface Design) | 3 |
| CIS 279 (Designing for Digital Environments) | 3 |
| CIS 289 (Game Design and Development Capstone) | 4 |

|  | Credits |
|---|---|
| **General Electives** | **2** |

| | |
|---|---|
| **Total Degree Requirements** | **60 credits** |
| **Total Degree Cost** | **60 minimum billable contact hours** |

# GENERAL TECHNOLOGY

## Applied Science and Engineering Technology Division

The associate of applied science degree with specialization in general technology is designed to provide students with an opportunity to earn a degree that can be molded to fit individual needs and interests. Examples include those who have been in an apprenticeship program, individuals working in an industry who want to design a degree that supports their job-related responsibilities or those who want to prepare themselves for a technical career that does not follow one of the college's existing programs.

A basic core of technical courses is required. However, if a student's needs or interests are better served by other technical subjects, the core can be customized. Students must, however, complete a basic core of 12 credit hours in a defined program area (product and process technology, welding, etc.). This area will be selected by the student. The program provides wide latitude under the technical electives. Students may choose from management courses, computer information systems courses or any technical course offered through the Applied Science and Engineering Technology Division.

Students with apprenticeship training who wish to apply that training toward a degree should see the "Requirements for the Associate of Applied Science Degree-AAS" entry in the Graduation and Degree Requirements section of the college catalog.

### Career Opportunities

The career opportunities for this program of study vary depending upon the technical and specialty courses chosen.

### Transfer Information

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

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 and CAD I) | 4 |
| C5 | Expressions of the Human Experience Competency | 3 |
| C6 | Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | **Credits** |
|---|---|
| **Required Technical and Specialty Courses** | **32** |
| Basic core in a defined program area | 12 |
| Additional Technical and Specialty Courses | 20 |

| **General Electives** | **7** |
|---|---|

*(as required to complete 60 hours)*

| **Total Degree Requirements** | **60 credits** |
|---|---|
| **Total Degree Cost** | **80 minimum billable contact hours** |

*\* 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.*

# GRAPHIC DESIGN "STACKABLE" CERTIFICATES

## Business Division

Monroe County Community College's "stackable" certificates in graphic design enable students to obtain a broad introduction into the concepts and techniques used in the field. These certificates can be "stacked" and applied toward additional certificates and/or an associate of applied science degree in graphic design. MCCC's associate of applied science degree has two concentrations: digital media and illustration. Students in the digital media concentration will explore the fundamentals of design, creation of graphical assets, publication design, three-dimensional design and time-based media using industry-standard software. Students in the illustration concentration will explore the digital media concepts with a focus on art history and traditional art fundamentals.

## Career Opportunities

Students may work as graphic designers, desktop publishers, pre-press technicians, commercial artists, entry-level Web designers and multimedia artists.

## Transfer Information

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

| | Credits |
|---|---|
| **Computer Graphics: Basic Certificate** | **13** |

CIS 130 (Introduction to Computer Information Systems) . . . . . . . . . . . . 3
CIS 178 (Design Concepts) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
CIS 182 (Illustrator Graphics). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 184 (Photoshop Graphics). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

| | Credits |
|---|---|
| **Digital Media: Basic Certificate** | **15** |

CIS 130 (Introduction to Computer Information Systems) . . . . . . . . . . . . 3
CIS 186 (Multimedia Development) . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 187 (Digital Video Editing) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 188 (InDesign Desktop Publishing) . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 189 (3D Animation) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

| | Credits |
|---|---|
| **Graphic Design: Digital Media Certificate** | **31** |

**Required Courses**
ART 151 (Art Fundamentals) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 160 (Two Dimensional Design). . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 130 (Introduction to Computer Information Systems) . . . . . . . . . . . . 3
CIS 178 (Design Concepts) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
CIS 182 (Illustrator Graphics). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 184 (Photoshop Graphics). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 188 (InDesign Desktop Publishing) . . . . . . . . . . . . . . . . . . . . . . . . 3
Select any three of the following courses:
CIS 186 (Multimedia Development) . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 187 (Digital Video Editing) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 189 (3D Animation) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 284 (Advanced Photoshop Graphics) . . . . . . . . . . . . . . . . . . . . . . . 3

| | |
|---|---|
| **Total Certificate Requirements** | **31 credits** |
| **Total Certificate Cost** | **37 minimum billable contact hours** |

| | Credits |
|---|---|
| **Illustration: Basic Certificate** | **15** |

ART 151 (Art Fundamentals) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 160 (Two Dimensional Design). . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 165 (Illustration Techniques). . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 170 (Life Drawing) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
ART 180 (Drawing I) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

| | Credits |
|---|---|
| **Graphic Design: Illustration Certificate** | |
| **Required Courses** | **28** |

ART 151 (Art Fundamentals) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
Select any two of the following courses:
ART 160 (Two Dimensional Design)
  or ART 165 (Illustration Techniques)
  or ART 170 (Life Drawing) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 6
ART 180 (Drawing I). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 130 (Introduction to Computer Information Systems) . . . . . . . . . . . 3
CIS 178 (Design Concepts) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
CIS 182 (Illustrator Graphics). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 184 (Photoshop Graphics). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
HUMAN 152 (Exploring Creativity) . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

| | |
|---|---|
| **Total Certificate Requirements** | **28 credits** |
| **Total Certificate Cost** | **40 minimum billable contact hours** |

| | Credits |
|---|---|
| **Interaction Design: Basic Certificate** | **15** |

CIS 130 (Introduction to Computer Information Systems) . . . . . . . . . . . . 3
CIS 178 (Design Concepts) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 182 (Illustrator Graphics). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
  or CIS 184 (Photoshop Graphics). . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 277 (User Interface Design). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 279 (Designing for Digital Environments) . . . . . . . . . . . . . . . . . . . . 3

| | Credits |
|---|---|
| **Graphic Design: Interaction Design Certificate** | |
| **Required Courses** | **31 or 32** |

CIS 130 (Introduction to Computer Information Systems) . . . . . . . . . . . . 3
Select one of the two following courses:
CIS 135 (Scripting Language Programming) . . . . . . . . . . . . . . . . . . . . . 3
  or CIS 150 (Computer Science I) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
CIS 178 (Design Concepts). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
CIS 182 (Illustrator Graphics). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 184 (Photoshop Graphics). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 186 (Multimedia Development) . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 187 (Digital Video Editing) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 189 (3D Animation). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 277 (User Interface Design). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
CIS 279 (Designing for Digital Environments) . . . . . . . . . . . . . . . . . . . . 3

| | |
|---|---|
| **Total Certificate Requirements** . . . . . . . | **31-32 credits** |
| **Total Certificate Cost** | **32 minimum billable contact hours** |

# GRAPHIC DESIGN

## Business Division

Monroe County Community College's associate of applied science degree in graphic design enables students to obtain a broad introduction to the concepts and techniques used in the field of graphic design. The associate of applied science degree has two concentrations: digital media and illustration. Students in the digital media concentration will explore the fundamentals of design, creation of graphical assets, publication design, three-dimensional design and time-based media using industry-standard software. Students in the illustration concentration will explore the digital media concepts with a focus on art history and traditional art fundamentals.

## Career Opportunities

Students may work as graphic designers, desktop publishers, pre-press technicians, commercial artists, entry-level Web designers and multimedia artists.

## Transfer Information

For information regarding transfer opportunities for this or any program, please visit the Transfer section of the MCCC website.

> 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** | **19-20** |
| C1 Natural Science Competency | 4 |
| C2 Mathematics Competency | 3 or 4 |
| C3 ENGL 151 (English Composition I) | 3 |
| C4 CIS 130 (Introduction to Computer Information Systems) | 3 |
| C5 Expressions of the Human Experience Competency | 3 |
| C6 Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | **Credits** |
|---|---|
| **Required Core Courses** | **16** |
| ART 151 (Art Fundamentals) | 3 |
| ART 160 (Two Dimensional Design) | 3 |
| CIS 130 (Introduction to Computer Information Systems) | C4 |
| CIS 178 (Design Concepts) | 4 |
| CIS 182 (Illustrator Graphics) | 3 |
| CIS 184 (Photoshop Graphics) | 3 |

**Choose one of the following concentrations:**

|  | **Credits** |
|---|---|
| **Digital Media Concentration** | **25** |
| CIS 186 (Multimedia Development) | 3 |
| CIS 187 (Digital Video Editing) | 3 |
| CIS 188 (InDesign Desktop Publishing) | 3 |
| CIS 189 (3D Animation) | 3 |
| CIS 277 (User Interface Design) | 3 |
| CIS 279 (Designing for Digital Environments) | 3 |
| CIS 284 (Advanced Photoshop Graphics) | 3 |
| General Electives | 4 |

**OR**

|  | **Credits** |
|---|---|
| **Illustration Concentration** | **25** |
| ART 165 (Illustration Techniques) | 3 |
| ART 170 (Life Drawing) | 3 |
| ART 180 (Drawing I) | 3 |
| ART 181 (Drawing II) | 3 |
| ART 280 (Art History: Prehistoric to Gothic) or ART 281 (Art History: Renaissance to Baroque) or ART 282 (Art History: Neo-Classical to Early Modern) | C5 |
| HUMAN 152 (Exploring Creativity) | 3 |
| CIS/ART Electives | 6 |
| General Electives | 4 |

| **Total Degree Requirements** | **60-61 credits** |
|---|---|
| **Total Degree Cost** | **69 minimum billable contact hours** |

# MANUFACTURING TECHNOLOGY

## CNC MACHNING & CAD/CAM (formerly Product and Process Technology)

### Applied Science and Engineering Technology Division

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 product and process 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

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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

---

| Required General Education Courses | Credits 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 page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

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| Required Core Courses | Credits 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 Programs: 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 the absolute competetive 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 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 Machining and various articulated measuring arms use should consider the following certificate, where are 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.*

# MECHANICAL DESIGN TECHNOLOGY

## Applied Science and Engineering Technology Division

The associate of applied science degree with specialization in mechanical design technology is designed to prepare students for careers that follow the design process of a manufactured product from inspiration to final production. Automobiles, robotics, aerospace products, machinery, computer and electronic products – the list of products designed by people in this field could go on forever. Mechanical design students receive training in the latest solid-modeling computer aided design (CAD) software. The CAD programs utilized in the design program are DraftSight, AutoCAD, SOLIDWORKS and CATIA. Possessing skills and knowledge in multiple CAD programs makes our design graduates more marketable – it is all about having an edge. Mechanical design is a dynamic field that attracts talented, creative people. The need for advanced technology products in the medical, transportation and energy fields, as well as the growing global competition among businesses, is expected to keep designers busy for many years to come.

### Career Opportunities

According to the Bureau of Labor Statistics, employment of commercial and industrial designers is expected to grow 4 percent in the 10-year period leading up to 2026. Employment growth will arise from an increase in consumer and business demand for new or upgraded products. Typical mechanical design titles include:

- CAD operator
- Design engineer
- Field technician
- Industrial designer
- Product designer
- Mechanical designer
- Research and development technician

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 and CAD I) . . . . . . . . . . . . . . . 4
C5 Expressions of the Human Experience Competency . . . . . . . . . . 3
C6 Social Systems Competency . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | Credits |
|---|---|
| **Required Core Courses** | **40-41** |

**1st Semester**
MDTC 160 (Mechanical Drafting and CAD I) . . . . . . . . . . . . . . . . . . . . . 4
MECH 102 (Manufacturing Processes) . . . . . . . . . . . . . . . . . . . . . . . . . 4
MECH 103 (Machining Basics and CNC). . . . . . . . . . . . . . . . . . . . . . . . 4

**2nd Semester**
MDTC 152 (Descriptive Geometry) . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
MDTC 161 (Mechanical Drafting and CAD II). . . . . . . . . . . . . . . . . . . . . 4
MDTC 228 (Introduction to SOLIDWORKS-CSWA). . . . . . . . . . . . . . . . 3

**3rd Semester**
MDTC 226 (Geometric Dimensioning and Tolerancing) . . . . . . . . . . . . . 3
MDTC 236 (Rapid Prototyping) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
Restricted Elective . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

**4th Semester**
MDTC 242 (Mechanical Design Capstone Project) . . . . . . . . . . . . . . . . 4
METC 170 (Introduction to Parametric CAD/CATIA)
  or METC 172 (Introduction to Parametric CAD/UG NX). . . . . . . . . . 3-4
METC 220 (Statics & Strength of Materials). . . . . . . . . . . . . . . . . . . . . . 4

### Restricted Electives (select one)
MATL 101 (Industrial Materials) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
MDTC 232 (Advanced SOLIDWORKS-CSWP) . . . . . . . . . . . . . . . . . . . 3
MECH 201 (CAD/CAM I) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
QSTC 150 (Introduction to Metrology) . . . . . . . . . . . . . . . . . . . . . . . . . . 3

| **Total Degree Requirements** | **61-62 credits** |
|---|---|
| **Total Degree Cost** | **83 minimum billable contact hours** |

*\* 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: Mechanical Design Technology

In addition to the two-year associate degree program, Monroe County Community College offers a certificate program in mechanical design 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 152 (Descriptive Geometry) . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
MDTC 160 (Mechanical Drafting and CAD I) . . . . . . . . . . . . . . . . . . . . . 4
MDTC 161 (Mechanical Drafting and CAD II). . . . . . . . . . . . . . . . . . . . . 4
MDTC 228 (Introduction to SOLIDWORKS-CSWA). . . . . . . . . . . . . . . . 3
MECH 102 (Manufacturing Processes) . . . . . . . . . . . . . . . . . . . . . . . . . 4
MECH 103 (Machining Basics and CNC). . . . . . . . . . . . . . . . . . . . . . . . 4

| **Total Degree Requirements** | **23 credits** |
|---|---|
| **Total Degree Cost** | **34 minimum billable contact hours** |

# MECHANICAL ENGINEERING TECHNOLOGY

## Applied Science and Engineering Technology Division

The associate of applied science degree with specialization in mechanical engineering technology offers individuals the opportunity to prepare for rewarding and responsible careers in support of technical and engineering activities in business and industry. The mechanical engineering technology curriculum is based on engineering theory, but emphasis is placed on application, implementation skills and computer modeling. The mechanical engineering technologist is responsible for the application and implementation of engineering design methods and analysis techniques for the improvement of products, processes and systems. Coursework within the program includes automation, manufacturing processes, strength of materials, computer-aided drafting, computer-aided manufacturing, machine design, quality, and thermodynamics. The rapid increase in the complexity of technology has produced a demand for professionals who have multi-disciplined applied technical skills. Our mechanical engineering technology graduates have skills to meet that demand.

### Career Opportunities

Mechanical engineering technology graduates may seek immediate employment in industry. They will be prepared for entry-level employment in careers such as:

- Lab technician
- Mechanical design specialist
- Mechanical engineering technician
- Product designer
- Research and development technician
- Technical sales representative
- Test technician

### Transfer Information

Graduates of this program meet the minimum requirements for placement at the junior level of bachelor of engineering technology programs at many four-year institutions. Students planning to transfer to a four-year program should consult with that institution in order to insure the maximum number of courses that transfer.

Students who intend to transfer into a bachelor of science degree program in mechanical engineering technology should consider taking the calculus  (MATH 171, 172) sequence and engineering physics (PHY 251, 252) sequence.

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

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 151 (General Physics I) | 4 |
| C2 | MATH 164 (Precalculus) | |
|  | or qualifying scores on accepted placement test | 4 |
| C3 | ENGL 151 (English Composition I) | 3 |
| C4 | MDTC 160 (Mechanical Drafting and CAD I) | 4 |
| C5 | Expressions of the Human Experience Competency | 3 |
| C6 | Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | Credits |
|---|---|
| **Required General Education Courses** | **45-47** |

**1st Semester**
MDTC 160 (Mechanical Drafting and CAD I) . . . . . . . . . . . . . . . . . . . . . .C4
MECH 102 (Manufacturing Processes) . . . . . . . . . . . . . . . . . . . . . . . . . 4
MATH 164* (Precalculus) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .C2
PHY 151 (General Physics I) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .C1

**2nd Semester**
MECH 103 (Machining Basics and CNC). . . . . . . . . . . . . . . . . . . . . . . . 4
METC 100 (Introduction to Engineering and Technology) . . . . . . . . . . . . 3
ENGL 151 (English Composition I)  . . . . . . . . . . . . . . . . . . . . . . . . . . . .C3
ELEC 125 (Introduction to Electricity). . . . . . . . . . . . . . . . . . . . . . . . . . . 3
METC 170 (Introduction to Parametric CAD/CATIA) . . . . . . . . . . . . . . . 3

**Summer Semester**
Expressions of the Human Experience Competency . . . . . . . . . . . . . . .C5
Social Systems Competency . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .C6

**3rd Semester**
METC 160 (Math Applications in Engineering Technology) . . . . . . . . . . . 2
METC 234 (Thermodynamics and Fluid Sciences) . . . . . . . . . . . . . . . . 4
MECH 111 (Introduction to Fluid Power). . . . . . . . . . . . . . . . . . . . . . . . . 3
CHEM 151** (General College Chemistry I)
   or MECH 131 (Introduction to Automation) . . . . . . . . . . . . . . . . . . . . 3-4
Restricted Tech Elective . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

**4th Semester**
MATL 101 (Industrial Materials) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
METC 220 (Statics & Strength of Materials). . . . . . . . . . . . . . . . . . . . . . 4
PHY 152** (General Physics II)
   or MECH 131 (Introduction to Automation) . . . . . . . . . . . . . . . . . . . . 3-4
Restricted Tech Elective  . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

*Or take MATH 157 (College Algebra) and MATH 159 (Trigonometry and Analytical Geometry).*
**Chemistry Option: Take CHEM 151 (General College Chemistry I) in 3rd Semester and MECH 131 (Introduction to Automation) in 4th Semester. Physics Option: Take MECH 131 (Introduction to Automation) in 3rd Semester and PHY 152 (General Physics II) in 4th Semester.*

### Restricted Tech Electives  (3 credits each)

MDTC 226 (Geometric Dimensioning and Tolerancing)
QSTC 115 (Statistical Process Control)
MECH 201 (Introduction to CAD/CAM)
ELEC 141 (Industrial Automation and Process Control)
ELEC 130 (Programmable Logic Controllers)
Cooperative Work Experience (Division Approval)

| | |
|---|---|
| **Total Degree Requirements** | **66-68 credits** |
| **Total Degree Cost** | **89 minimum billable contact hours** |

# METROLOGY AND QUALITY TECHNOLOGY

## Applied Science and Engineering Technology Division

The associate of applied science degree with specialization in metrology and quality technology (precision measurement and quality) is designed to meet the precision measurement and quality needs of industry by preparing graduates through both theoretical and hands-on laboratory work to successfully enter the work force. Metrology and quality are used throughout the world in such areas as telecommunications, manufacturing, electrical power, aerospace, transportation, medicine, pharmaceuticals, food production, packaging, construction, national defense, atmospheric research and environmental protection. The metrology and quality technology program at MCCC emphasizes dimensional metrology and quality standards for the manufacturing industry.

### Career Opportunities

Individuals with dimensional metrology skills, especially coordinate measuring machine (CMM) operators, are in high demand. MCCC is one of only a handful of colleges offering a program in dimensional metrology technology (one of only two in Michigan).

Graduates of this program will be prepared for employment in the following areas:

- Calibration technician
- CMM (coordinate measuring machine) operator
- Inspection
- Lab technician
- Layout inspector
- Metrologist
- Metrology technician
- Quality assurance
- Quality auditor
- Quality control
- Quality manager
- Quality technician

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

| Required General Education Courses | Credits 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 and CAD I) | 4 |
| C5  Expressions of the Human Experience Competency | 3 |
| C6  Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

### Required Core Courses — Credits 39

**1st Semester**
- MDTC 160 (Mechanical Drafting and CAD I) . . . . . . . . . . . . . . . . . . . . . C4
- MATL 101 (Industrial Materials) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
- MECH 102 (Manufacturing Processes) . . . . . . . . . . . . . . . . . . . . . . . . 4
- MATH 119* (Elementary Technical Mathematics) . . . . . . . . . . . . . . . . . 2

**2nd Semester**
- MDTC 228** (Introduction to SOLIDWORKS-CSWA) . . . . . . . . . . . . . . 3
- MATH 124* (Technical Mathematics II) . . . . . . . . . . . . . . . . . . . . . . . C2
- ELEC 125 (Fundamentals of Electricity) . . . . . . . . . . . . . . . . . . . . . . . 3
- MDTC 109 (Mechanical Blueprint Reading) . . . . . . . . . . . . . . . . . . . . . 2

**3rd Semester**
- MECH 103 (Machining Basics and CNC) . . . . . . . . . . . . . . . . . . . . . . . 4
- QSTC 150 (Introduction to Metrology) . . . . . . . . . . . . . . . . . . . . . . . . . 3
- QSTC 111 (Quality Management) . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
- MDTC 226 (Geometric Dimensioning and Tolerancing) . . . . . . . . . . . . . 3

**4th Semester**
- QSTC 230 (Documentation and Audit Preparation) . . . . . . . . . . . . . . . . 3
- QSTC 210 (Advanced Metrology)
-    or QSTC 115 (Statistical Process Control) . . . . . . . . . . . . . . . . . . . . . 3
- QSTC 220 (Calibration and Gage R & R) . . . . . . . . . . . . . . . . . . . . . . . 3

| | |
|---|---|
| **Total Degree Requirements** | **60 credits** |
| **Total Degree Cost** | **72-74 minimum billable contact hours** |

*\* 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.*

*\*\* Will substitute for METC 170 (Introduction to Parametric Modelling-CAD/CATIA) or METC 172 (Computer Aided Design UG/NX)*

## Certificate Program: Metrology Technology

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.*

# Certificate Program: Quality Technology

In addition to the two-year associate degree program, Monroe County Community College offers a certificate program in quality systems technology. We recognize that many employers place value on a certificate which authenticates specialized educational preparation. The program concentrates on 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 |
|---|---|
| QSTC 111 (Quality Management) | 3 |
| QSTC 115 (Statistical Process Control) | 3 |
| QSTC 150 (Introduction to Metrology) | 3 |
| QSTC 230 (Documentation and Audit Preparation) | 3 |
| MDTC 109 (Mechanical Blueprint Reading) | 2 |
| ENGL 151 (English Composition I) | 3 |
| MATH 119 (Elementary Technical Mathematics) | 2 |
| MATH 124 (Technical Mathematics II) | 4 |

**Total Certificate Requirements**          **23 credits**

**Total Certificate Cost**          **24 minimum billable contact hours**

# NON-DESTRUCTIVE TESTING

## Applied Science and Engineering Technology Division

This is a course of study that will cover the basic concepts of the five major non-destructive testing (NDT) methods: visual testing (VT), liquid penetrant testing (PT), magnetic particle testing (MT), ultra sonic testing (UT) and radiographic testing (RT). The classroom hours, grading criteria and test composition associated with this coursework are established in accordance with the American Society for Nondestructive Testing (ASNT): Recommended Practice SNT-TC-1A. The certificate offerings are broken into a basic and advanced certificate, enabling students to pursue their desired level of expertise in the non-destructive testing field. The current offerings are directly relevant to both welding and nuclear technology associate of applied science degree majors.

Non-destructive testing involves the inspection, testing or evaluation of materials, components and assemblies for materials' discontinuities, properties and machine problems without further impairing or destroying the parts serviceability. Universally, the term NDT applies equally to the NDT inspection methods used for evaluation.

### Special Knowledge and Training Required for Evolving Industry

It is recognized that the effectiveness of non-destructive testing application depends upon the capabilities of the personnel who are responsible for and perform NDT. The courses are in accordance with SNT-TC-1A that has been prepared by ASNT to establish guidelines for the qualification and certification of NDT personnel whose specific jobs require appropriate knowledge of the technical principles underlying the non-destructive tests they perform, witness, monitor or evaluate. Through course progression, the student gains a general knowledge of how to apply NDT testing methods and develops a deeper understanding of how non-destructive testing impacts the world in which we live.

### Significant Job Growth Projected

There is a need for highly trained and certified non-destructive testing technicians worldwide. More opportunity exists for NDT professionals today than ever before. The American Society for Nondestructive Testing is one the world's largest technical societies for non-destructive testing professionals.

### Career Opportunities

Graduates of this program will be prepared for entry-level employment in the following areas:

- NDT technician
- Non-destructive testing evaluator
- Nuclear engineering technician
- Quality control technician
- Welding inspector

## Certificate Program: Non-Destructive Testing (NDT) Technician-Basic

MCCC offers a certificate program that concentrates on the basic and intermediate core competencies required to prepare the student for an ASNT Level I or II position in the non-destructive testing field.

|  | Credits |
|---|---|
| **Required Courses** | **14** |
| MATL 101 (Industrial Materials) | 3 |
| NUET 102 (Introduction to Non-Destructive Testing) | 3 |
| NUET 103 (Liquid Penetrant & Magnetic Particle Testing) | 2 |
| NUET 104 (Visual Testing) | 2 |
| WELD 100 (Introduction to Welding) | 4 |

| **Total Certificate Requirements** | **14 credits** |
|---|---|
| **Total Certificate Cost** | **19 minimum billable contact hours** |

## Certificate Program: Non-Destructive Testing (NDT) Technician-Advanced

|  | Credits |
|---|---|
| **Required Courses** | **11** |
| ELEC 125 (Fundamentals of Electricity) | 3 |
| NUET 105 (Radiography – Level I) | 2 |
| NUET 106 (Radiography – Level II) | 2 |
| NUET 107 (Ultrasonic – Level I) | 2 |
| NUET 108 (Ultrasonic – Level II) | 2 |

| **Total Certificate Requirements** | **11 credits** |
|---|---|
| **Total Certificate Cost** | **16 minimum billable contact hours** |

*Note: Students graduating from both the existing nuclear engineering technology and welding programs can broaden their employability chances after completion of the ASNT certificate.*

*Note: Completion of the MCCC certificate program in non-destructive testing does not complete the ASNT certification requirements. ASNT certification requires further hours of field experience working under a certified inspector. These hours may vary depending on the inspection method. The MCCC NDT program will satisfy classroom requirements for certification.*

# NUCLEAR ENGINEERING TECHNOLOGY

## Applied Science and Engineering Technology Division

The associate of applied science degree with specialization in nuclear engineering technology will enable prospective students to seek employment as nuclear engineering technicians in various sectors of the nuclear power industry. This specialization utilizes a learning approach that emphasizes both theory and hands-on skills necessary to function effectively in the technical environment of the nuclear industry. The program stresses effective oral and written communication as well as related mathematics, science and technical skills.

In addition to completion of this program, graduates will eventually need to pass appropriate background checks to be employable in the nuclear industry. Please check with the Admissions Office for details.

It is strongly recommended that students follow the prescribed course sequence, as some courses are only offered once in an academic year.

### Career Opportunities

The program is based on the Nuclear Uniform Curriculum Program (NUCP), a uniform standard administered by the Nuclear Energy Institute. Students who complete the program with an 80 percent score (B or better) in core classes will qualify for the NUCP Certificate, which is recognized industry wide.

Graduates of this program will be prepared for entry-level employment in the following areas:

- Electrical technician
- Instrumentation and control (I&C) technician
- Mechanical technician

Graduates with additional training experiences will be prepared for employment in the following areas:

- Non-licensed operator
- Radiation protection technician
- Senior reactor operator

> 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

### Required General Education Courses — Credits 20-21

| Code | Course | Credits |
|------|--------|---------|
| C1 | PHY 151 (General Physics I) | 4 |
| C2 | MATH 164 (Precalculus) or competency (MATH 151 Intermediate Algebra or qualifying score on accepted placement must be met prior to entry in the program) | 4 |
| C3 | Writing Competency | 3 |
| C4 | CIS 130 (Introduction to Computer Information Systems) or MDTC 160 (Mechanical Drafting CAD I) | 3 or 4 |
| C5 | Expressions of the Human Experience Competency | 3 |
| C6 | Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

### Required Core Courses — Credits 48

**1st Semester**

| Course | Credits |
|--------|---------|
| PHY 151 (General Physics I) | C1 |
| MATH 164* (Precalculus) | C2 |
| METC 100 (Introduction to Engineering & Technology) | 3 |
| NUET 100 (Nuclear Industry Fundamentals) | 2 |
| Computer Literacy Competency | C4 |

**2nd Semester**

| Course | Credits |
|--------|---------|
| ENGL 151 (English Composition I) | C3 |
| NUET 120 (Radiation Protection) | 3 |
| NUET 220 (Power Plant Components) | 3 |
| ELEC 125 (Fundamentals of Electricity) | 3 |
| MATL 121 (Nuclear Plant Materials) | 3 |

**Summer Semester**

| Course | Credits |
|--------|---------|
| NUET 205 (Nuclear Plant Experience) | 2 |
| Expressions of the Human Experience Competency | C5 |

**3rd Semester**

| Course | Credits |
|--------|---------|
| CHEM 151 (Chemistry I) | 4 |
| METC 160 (Math Applications in Engineering Technology) | 2 |
| ELEC 133 (Circuit Analysis) | 4 |
| METC 234 (Thermodynamics and Fluid Sciences) | 4 |
| NUET 130 (Plant Systems I) | 3 |

**4th Semester**

| Course | Credits |
|--------|---------|
| ELEC 141 (Industrial Automation and Process Control) | 3 |
| NUET 230 (Plant Systems II) | 3 |
| NUET 240 (Reactor Theory, Safety and Design) | 3 |
| Social Systems Competency | C6 |
| ELEC 211 (Medium Voltage Power Distribution System) | 3 |

**Total Degree Requirements** — 68-69 credits

**Total Degree Cost** — 85-87 minimum billable contact hours

*\* MATH 157 (College Algebra) and MATH 159 (Trigonometry and Analytical Geometry) may substitute for MATH 164 (Precalculus).*

# NURSING, PRACTICAL

## Health Sciences Division

A practical nursing certificate prepares students to function as beginning licensed practical nurses and members of the health team under the supervision of a registered nurse, physician or dentist in the care of stable individuals with acute and chronic illnesses.

Licensed practical nurses provide basic bedside nursing care and are qualified for employment in structured practice settings, including acute care hospitals, extended care facilities, community settings, nursing homes, clinics and physicians' offices.

Monroe County Community College's program offers learning opportunities in the classroom, laboratory setting and clinical setting. After admission to the program, a total of 38 credit hours of study is required. The practical nursing program is fully approved through the Michigan Board of Nursing.

### Career Opportunities

Upon program completion, students will be prepared and eligible to apply for licensure in the State of Michigan. Students must meet the Michigan Board of Nursing eligibility requirements and successfully pass the National Council Licensure Exam (NCLEX-PN) in order to become a licensed practical nurse. Students may also be eligible for licensure in other states; students are encouraged to contact a state's board of nursing for eligibility requirements.

Currently, the greatest employment opportunities for practical nurses are in extended care and community settings. With experience, practical nurses may also function in providing nursing care in specialized areas, including, but not limited to, home health and hospice settings, and in charge nurse and management positions in extended care facilities and nursing homes.

The average salary for licensed practical nurses is $47,000 (Bureau of Labor Statistics, 2018). Practical nursing is an excellent entry-level career choice, and graduates may qualify to complete advanced degrees in nursing with more education.

### Continuing Education Information

Upon program completion, students may automatically progress to the PN to RN program option offered by MCCC in the year immediately following program completion. For further information about the MCCC PN to RN option, please visit the PN to RN section of the MCCC website. For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

### Additional Program Information

Admission to the program involves four steps:
1. Admission to the college.
2. Completion of preapplication requirements; the Office of Admissions and Guidance confirms that the criteria listed below have been met by the application date of the first Monday in October.
3. Verification of the completion of the program application. Applications must be submitted by the first Monday in October each year. Students must apply every year.
4. Returning students in good standing with the program will be considered for reenrollment/readmission first. Additional candidates will be accepted according to the criteria below until a class is fully enrolled; up to 24 students per class.

Applications submitted after the deadline will only be considered if seats are available. Students who will complete required pre-application course work at the end of the Fall Semester (after the application deadline) are encouraged to submit application materials for consideration and may be offered conditional acceptance into the program pending successful completion of those courses. If necessary, the tie breaker criteria will be used to rank applicants.

**Meeting minimum requirements does not guarantee acceptance into the practical nursing program.**

### Specific Criteria for Completion of Prerequisites

Develop a folder in the Admissions and Guidance Office consisting of the following:
1. Evidence of high school graduation (official high school transcripts or GED).
2. Official transcripts from all post-secondary schools must be submitted for evaluation.
3. Cumulative grade point average of 2.5 (on a 4.0 scale) from the most recent academic institution attended.
4. Satisfactory completion of MATH 092 (formerly MATH 150) or qualifying score on accepted placement test.
5. Completion of the following course work with a "C-" or better:
   a. ENGL 151 (English Composition I)
   b. PSYCH 151 (General Psychology)
   c. BIOL 257 (Anatomy & Physiology I).
   *NOTE: Anatomy & Physiology credits cannot be more than 10 years old.*

### Other Considerations for Application

Basic personal computer proficiency: Incoming students are expected to demonstrate a minimum proficiency with the use of a personal computer and basic software programs. These minimum proficiencies include:
- The ability to use the Internet to find and retrieve information including: locating an Internet site given a URL; navigating between information sources; doing basic searches using a major Internet search service, and submitting information via on-line forms.
- The ability to use electronic mail as a form of communication including: sending an email when given an email address; responding to an email; sending email to a group of individuals, and sending and receiving attachments as part of an email.
- The ability to use a word processing program to create and edit documents including: creating a new document; editing an existing document; changing the format of text; and changing margins, page orientation, and other elements of page layout.
- The ability to use an operating system including copying or moving a file to or from removable media; finding files or folders on a local hard drive, and creating a sub-directory (folder).

   Students who do not possess these basic proficiency skills prior to entering the program will be unable to meet the course and program student learning outcomes, resulting in course failure and/or program dismissal. Students without these skills or who are uncertain of their level of proficiency are encouraged to take a computer course, such as CIS 130 ( Introduction to Computer Information Systems), prior to submitting an application.

HLTSC 110 (Medical Terminology) is encouraged but not required.

**Enrollment in the practical nursing program is limited.** If the number of qualified applicants exceeds the number of seats available, the following tie breakers will be used in this order:

1. Completed BIOL 258 (Anatomy & Physiology II) with a "C-" or higher*
2. Completed HLTSC 120 (Pharmacology) with a "C-" or higher*
3. County resident over non-county resident
4. Higher cumulative GPA over lower GPA in the following courses: ENGL 151 (English Composition I), PSYCH 151 (General Psychology), BIOL 257 (Anatomy & Physiology I)
   *Completion of BIOL 258 (Anatomy & Physiology II) and HLTSC 120 (Pharmacology) are strongly recommended prior to admission, but not required.*

Nursing program admission requirements are separate from general admission to the college and are subject to change. To be accepted into the nursing program, a student must meet the requirements in effect for the class and year of admission.

## General Information

1. Immunizations and examinations at the student's expense to ensure that the student meets the technical requirements of the program.
2. Nursing students are required to have professional liability and personal health insurance. The professional liability insurance is provided by the college. Personal health insurance must be obtained by the student and maintained throughout the program in order to comply with clinical agency requirements. Proof of insurance will be required prior to participating in the first clinical activity.
3. Students admitted to health science programs must consent to background/security checks including a criminal background check and drug screening. The student is responsible for any cost associated with the background/security/drug screening checks. Certain criminal convictions may render a student ineligible to train at clinical sites which are necessary in order to successfully complete the program. Additionally, certain criminal convictions may render an individual ineligible to take the licensing/certification exam or to be licensed/certified in the State of Michigan. The college will review the results and determine, on a case-by-case basis, whether to deny admission to any individual based on the results of the criminal background check and drug screening.
4. An active American Heart Association cardiopulmonary resuscitation (CPR) certificate for professional rescuer of infant, child and adult.
5. Practical nursing involves the provision of direct care for individuals and families and is characterized by the application of verified knowledge in the skillful performance of nursing functions. Therefore, in order to be considered for admission or to continue in the program, all applicants must be able to meet the health sciences technical standards available in the Health Sciences Division section of the MCCC website.
   A prospective student or participant in the program with an approved documented disability can request reasonable accommodations to meet these standards. The college will provide appropriate accommodations but is not required to fundamentally alter the requirements or nature of the program or lower its academic standards. Requests for accommodations should be directed to a disability services counselor in the Student Success Center. To make an appointment, please call 734.384.4167.

6. Students must complete the practical nursing program within two years of initial entry into the program. Failure to meet the time framework necessitates program dismissal and reapplication to the nursing program.
7. All nursing students utilize Internet services and resources to supplement instruction. Students must have reliable internet access. Students enrolled in the nursing program will be required to take assessments (ie: exams, quizzes, etc) electronically using an online assessment program called ExamSoft Examplify. Students enrolled in these courses will be required to provide their own computer (with a webcam and microphone) that will support the assessment software. The software can be used on most modern Microsoft Windows-based computers and Mac OS X devices. Information related to minimum system requirements can be located by visiting the following links:
   **Windows:** https://examsoft.force.com/emcommunity/s/article/Examplify-Minimum-System-Requirements-for-Windows
   **Mac OS X:** https://examsoft.force.com/emcommunity/s/article/Examplify-Minimum-System-Requirements-for-Mac-OS-X

   Students are encouraged to check with the Health Science Division for a complete list of minimum system requirements.
8. Nursing education offered at MCCC is provided in collaboration with multiple clinical partners located in southeast Michigan and northwest Ohio. As a part of these partnerships, MCCC students and faculty are required to meet and follow the policies and procedures of these clinical partners. Given the number of students in the program, the program must be able to place students at any of the clinical agencies for clinical and observational experiences during the course of the program. Students need to be in good standing with all clinical agencies, both as a student and as a member of the community. Therefore, any condition (i.e. criminal history, positive drug screening, unprofessional/unethical behavior, negative employment history) that prevents a student from being placed in any clinical agency during a semester may jeopardize the student's ability to meet the course objectives and may lead to course failure and program dismissal.
9. A student must receive a "C" or better grade in all practical nursing courses. A "C-" or better is required in all non-nursing program courses including HLTSC 120 (Pharmacology) and BIOL 258 (Anatomy & Physiology II). Failure to meet this requirement may result in the student being dismissed from the practical nursing program. Nursing and required non-nursing courses must be completed in the order outlined in the program's plan of study (see course sequence for requirements). Anatomy and Physiology courses must have been completed within the last 10 years of application to the program.
10. Students will be expected to maintain a flexible schedule for the nursing program. Clinical assignments vary and are subject to change. This may include any day of the week and any shift, including weekends. On days that are not scheduled for class or clinical, students may be expected to view audiovisual material, study in the skills laboratory or participate in other on-campus activities. Usually, these activities are self-scheduled. There may be added classes on other days, but students will receive notice of these in advance.
11. In conjunction with requirements set forth by the Michigan Licensing and Regulatory Affairs agency, information related to the student complaint process, career opportunities by state,

and licensing requirements by state can be accessed by visiting the following websites: a) Student Complaint Process: see the Consumer Information section of the MCCC website; b) Career opportunities by state: https://bls.gov/; and c) Licensure requirements by state: https://www.ncsbn.org/14730.htm.

12. In addition to the general college rules, practical nursing students are required to adhere to policies and procedures outlined in the Practical Nursing Program Student Information Handbook available in the Nursing, Practical section of the MCCC website. Students are encouraged to review the handbook prior to application.

## Technical Standards

The purpose of the technical standards is to inform students choosing to enter into a health occupation program of the basic minimal technical standard requirements that must be met in order to complete all course work objectives and student outcomes. The listed standards encompass what is minimally required to perform necessary tasks. This list is not exhaustive, and can be modified as the college deems necessary at any time. Students enrolled in a health occupation program at MCCC must provide care that is safe and effective. These technical standards apply to any student enrolling in any one of the health occupations programs. The student must be able to demonstrate sufficient cognitive, professional, motor (physical), sensory, and other abilities, with or without accommodation, to meet program technical standards. Technical standard requirements are listed below. Examples of tasks associated with each requirement and standard are available for review by visiting the Health Sciences Division section of the MCCC website. Prospective students are encouraged to review the Technical Standards for Health Occupational Programs document in its entirety prior to enrolling in or applying to any health occupation course or program.

- **Critical Thinking and Cognitive Competencies:**
  Sufficient critical thinking and cognitive abilities in classroom and clinical settings.

- **Professionalism:**
  Interpersonal skills sufficient for professional interaction with a diverse population of individuals, families, and groups.

- **Communication:**
  Communication sufficient for professional interactions.

- **Mobility:**
  Physical abilities sufficient for movement from room to room and in small spaces.

- **Motor Skills:**
  Gross and fine motor abilities which are sufficiently effective and safe for providing allied health care.

- **Sensory:**
  Auditory and visual ability sufficient for observing, monitoring, and assessing health needs.

- **Observation:**
  Ability to sufficiently make observations in a health care environment, consistent with program competencies.

- **Tactile sense:**
  Tactile ability sufficient for physical assessment.

*See item No. 5 under "General Information" for information regarding accommodations.*

|  | Credits |
|---|---|
| **Required Courses** | **38** |

**Winter Semester**
PNUR 121 (Fundamentals of Practical Nursing) . . . . . . . . . . . . . . . . . . 9
HLTSC 120 (Pharmacology) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
BIOL 258 (Anatomy and Physiology II) . . . . . . . . . . . . . . . . . . . . . . . . 4

**Summer Semester**
PNUR 124 (Practical Nursing Care of Adults I) . . . . . . . . . . . . . . . . . . 6
PNUR 123 (Mental Health Concepts for Practical Nursing) . . . . . . . . . . 2
PNUR 130 (Maternal and Child Care for the
            Practical Nurse) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4

**Fall Semester**
PNUR 127 (Practical Nursing Care of Adults II) . . . . . . . . . . . . . . . . . . 5
PNUR 128 (Issues in Practical Nursing) . . . . . . . . . . . . . . . . . . . . . . . . 2
PNUR 129 (Management Concepts for the Practical Nurse) . . . . . . . . 3

| | |
|---|---|
| **Total Certificate Requirements** | **38 credits** |
| **Total Certificate Cost** | **65 minimum billable contact hours** |

* Plan of study subject to change

# NURSING, REGISTERED

## Health Sciences Division

The associate of applied science degree with specialization in nursing prepares graduates to function as beginning registered nurse clinicians and members of the health care team in the care of acutely and chronically ill individuals. Registered nurses are qualified for employment in structured practice settings, including acute care hospitals, extended care facilities, nursing homes, clinics and physicians' offices. With experience, nurses may also participate in providing skilled care in more specialized areas, including psychiatric units, emergency departments, pediatric and obstetric units, critical care units and home health settings. Job pay is exceptional, averaging $71,700 annually for practicing nurses, according to the Bureau of Labor Statistics (2018), and nursing is a flexible and mobile career choice.

### Career Opportunities

Upon program completion, students will be prepared and eligible to apply for licensure in the State of Michigan. Students must meet the Michigan Board of Nursing eligibility requirements and successfully pass the National Council Licensure Exam (NCLEX-RN) in order to become a licensed registered nurse. Students may also be eligible for licensure in other states; students are encouraged to contact a state's board of nursing for eligibility requirements.

### Transfer Information

Upon program completion, students may be eligible to enroll in a RN to BSN completion program. MCCC's RN program has articulation with several four-year university partners. For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

The MCCC Health Sciences Division has also partnered with Eastern Michigan University to offer students a concurrent enrollment opportunity that will allow accepted nursing students to simultaneously complete an associate of applied sciences in registered nursing and a bachelor of science in nursing—completion (degree from EMU). Students interested in participating in this program can get more information about enrollment and program requirements by contacting the Health Sciences Division Office, 734.384.4102, or the Admissions Office, 734.384.4104.

A student who desires to transfer into the MCCC registered nursing program from another nursing program must meet all criteria as listed in the Nursing, Registered section of the college's website.

### Additional Program Information

This nursing program is approved by the Michigan Board of Nursing and accredited by the Accreditation Commission for Education in Nursing: ACEN, 3343 Peachtree Road NE, Suite 850, Atlanta, GA 30326. Phone: (404) 975-5000, Fax: (404) 975-5020, www.acenursing.org.

### Nursing Admission Criteria

The registered nursing program is a selective admissions program. Nursing program applicants must meet established minimum criteria to be considered for the nursing program. Applications will be accepted two times per year, in June and October. Only applicants who meet established minimum criteria by the first Monday in June or the first Monday in October will be considered for the nursing program. The potential nursing applicant needs to be aware that meeting minimum standards does not ensure admission to the nursing program.

Applicants for the nursing program tend to be well qualified and will be accepted until each class is fully enrolled. Returning students in good standing with the program will be considered for reenrollment/readmission first. Additional candidates will be accepted according to the selection criteria below until a class is fully enrolled; up to 30 students per class.

Minimum admission criteria and nursing program selection criteria for each application deadline are available for review by visiting the Nursing, Registered section of the MCCC website. Students can also receive application information by contacting the Health Sciences Division Office at 734.384.4102 or by contacting the MCCC Admissions Office at 734.384.4104.

### General Information

1. The class will be selected from the pool of applicants by use of the numerical process.
2. Immunizations and examinations at the student's expense to ensure that the student can meet the technical standards of the program.
3. Nursing students are required to have professional liability and personal health insurance. The professional liability insurance is provided by the college. Personal health insurance must be obtained by the student and maintained throughout the program in order to comply with clinical agency requirements. Proof of insurance will be required prior to participating in the first clinical activity.
4. An active American Heart Association cardiopulmonary resuscitation (CPR) certificate for professional rescuer of infant, child and adult.
5. Students admitted to health science programs must consent to background/security checks including a criminal background check and drug screening. The student is responsible for any cost associated with the background/security/drug screening checks. Certain criminal convictions may render a student ineligible to train at clinical sites which are necessary in order to successfully complete the program. Additionally, certain criminal convictions may render an individual ineligible to take the licensing/certification exam or to be licensed/certified in the State of Michigan. The college will review the results and determine, on a case-by-case basis, whether to deny admission to any individual based on the results of the criminal background check and drug screening.
6. Registered nursing at the associate degree level involves the provision of direct care for individuals and families and is characterized by the application of verified knowledge in the skillful performance of nursing functions. Therefore, in order to be considered for admission or to continue in the program, all applicants must be able to meet the health sciences technical standards available in the Nursing, Registered section of the MCCC website.
   A prospective student or participant in the program with an approved documented disability can request reasonable accommodations to meet these standards. The college will provide appropriate accommodations, but is not required to fundamentally alter the requirements or nature of the program or lower its academic standards. Requests for accommodations should be directed to a disability services counselor in the Student Success Center. To make an appointment, please call 734.384.4167.

7. Incoming students must complete the program within three years of initially starting nursing classes. Failure to meet the three year program completion timeframe will result in program dismissal.

8. All nursing students utilize Internet services and resources to supplement instruction. Students must have reliable internet access. Beginning January 2020, students enrolled in the nursing program will be required to take assessments (ie: exams, quizzes, etc) electronically using an online assessment program called ExamSoft Examplify. Students enrolled in these courses will be required to provide their own computer (with webcam and microphone) that will support the assessment software. The software can be used on most modern Microsoft Windows-based computers and Mac OS X devices. Information related to minimum system requirements can be located by visiting the following links:

   **Windows:** https://examsoft.force.com/emcommunity/s/article/Examplify-Minimum-System-Requirements-for-Windows
   **Mac OS X:** https://examsoft.force.com/emcommunity/s/article/Examplify-Minimum-System-Requirements-for-Mac-OS-X

   Students are encouraged to check with the Health Sciences Division for a complete list of miminum system requirements.

9. Nursing education offered at MCCC is provided in collaboration with multiple clinical partners located in southeast Michigan and northwest Ohio. As a part of these partnerships, MCCC students and faculty are required to meet and follow the policies and procedures of these clinical partners. Given the number of students in the program, the program must be able to place students at any of the clinical agencies for clinical and observational experiences during the course of the program. Students need to be in good standing with all clinical agencies, both as a student and as a member of the community. Therefore, any condition (i.e. criminal history, positive drug screening, unprofessional/unethical behavior, negative employment history) that prevents a student from being placed in any clinical agency during a semester may jeopardize the student's ability to meet the course objectives and may lead to course failure and program dismissal.

10. The student must receive a "C" or better grade in all nursing courses and a "C-" or better grade in all non-nursing courses required in the program plan of study. Failure to meet this requirement may result in the inability to progress to the next semester of the program. Nursing and required non-nursing courses must be completed in the order outlined in the program's plan of study (see course sequence for requirements). Anatomy and Physiology courses must have been completed within the last ten years at the time of application to the program. Anatomy and Physiology courses must have been completed within the last ten years at the time of application to the program.

11. Students are expected to maintain a flexible schedule for the nursing program. Clinical assignments vary and are subject to change. This may include any day of the week and any shift, including weekends. On days that are not scheduled for class or clinical, students may be expected to view audiovisual material, study in the skills laboratory, or participate in other on-campus activities. Usually, these activities are self-scheduled. There may be added classes on other days, but students will receive notice of these in advance.

12. In conjunction with requirements set forth by the Michigan Licensing and Regulatory Affairs agency, information related to the student complaint process, career opportunities by state,

and licensing requirements by state can be accessed by visiting the following websites: a) Student Complaint Process: found in the Consumer Information Section of the MCCC website; b) Career opportunities by state: http://bls.gov/; and c) Licensure requirements by state: https://www.ncsbn.org/14730.htm.

13. In addition to the general college rules, nursing students are required to adhere to policies and procedures outlined in the Nursing Program Student Information Handbook. Students are encouraged to review the handbook prior to application. A copy of the Student Information Handbook is available in the Nursing, Registered section of the MCCC website.

## Technical Standards

The purpose of the technical standards is to inform students choosing to enter into a health occupation program of the basic minimal technical standard requirements that must be met in order to complete all course work objectives and student outcomes. The listed standards encompass what is minimally required to perform necessary tasks. This list is not exhaustive, and can be modified as the college deems necessary at any time. Students enrolled in a health occupation program at MCCC must provide care that is safe and effective. These technical standards apply to any student enrolling in any one of the health occupations programs. The student must be able to demonstrate sufficient cognitive, professional, motor (physical), sensory, and other abilities, with or without accommodation, to meet program technical standards. Technical standard requirements are listed below. Examples of tasks associated with each requirement and standard are available for review by visiting the Health Sciences Division section of the MCCC website. Prospective students are encouraged to review the Technical Standards for Health Occupational Programs document in its entirety prior to enrolling in or applying to any health occupation course or program.

- **Critical Thinking and Cognitive Competencies:**
  Sufficient critical thinking and cognitive abilities in classroom and clinical settings.

- **Professionalism:**
  Interpersonal skills sufficient for professional interaction with a diverse population of individuals, families, and groups.

- **Communication:**
  Communication sufficient for professional interactions.

- **Mobility:**
  Physical abilities sufficient for movement from room to room and in small spaces.

- **Motor Skills:**
  Gross and fine motor abilities which are sufficiently effective and safe for providing allied health care.

- **Sensory:**
  Auditory and visual ability sufficient for observing, monitoring, and assessing health needs.

- **Observation:**
  Ability to sufficiently make observations in a health care environment, consistent with program competencies.

- **Tactile sense:**
  Tactile ability sufficient for physical assessment.

*See item No. 6 under "General Information" for information regarding accommodations.*

While general electives are not required in the program, the following courses can be taken as desired and may be helpful to the student:

### Suggested Additional Courses:
BIOL 259 (Introduction to Pathophysiology) . . . . . . . . . . . . . . . . . . . . . . 4
BIOL 260 (General Microbiology) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
CHEM 150 (Fundamental Principles of Chemistry) . . . . . . . . . . . . . . . . 4
CHEM 160 (Fundamentals of Health-Science Chemistry) . . . . . . . . . . . 4
HLTSC 110 (Medical Terminology) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2
HLTSC 115 (Introduction to Health-Care Professions) . . . . . . . . . . . . . . 3
HLTSC 151 (Principles of Nutrition & Diet Therapy) . . . . . . . . . . . . . . . . 3
MATH 162 (Introduction to Statistics) . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
PHIL 254 (Introduction to Medical Ethics). . . . . . . . . . . . . . . . . . . . . . . . 3
PSYCH 254 (Lifespan Psychology) . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
SOC 151 (Principles of Sociology) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
SPCH 151 (Communication Fundamentals). . . . . . . . . . . . . . . . . . . . . . . 3

**Credits**

### Required General Education Courses  20
C1   BIOL 151 (Biological Sciences I) . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
C2   Mathematics Competency  . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
C3   ENGL 151 (English Composition I) . . . . . . . . . . . . . . . . . . . . . . . . . 3
C4   Computer Literacy Competency) . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
C5   Expressions of the Human Experience Competency. . . . . . . . . . . . 3
C6   PSYCH 151 (General Psychology) . . . . . . . . . . . . . . . . . . . . . . . . . 3

*See the General Education Requirements in the college catalog or on the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

### Required Courses and Sequence

**Non-Nursing Semester**
[1]ENGL 151 (English Composition I) . . . . . . . . . . . . . . . . . . . . . . . . . . .C3
[1]PSYCH 151 (General Psychology) . . . . . . . . . . . . . . . . . . . . . . . . . . .C6
[1]BIOL 151 (Biological Sciences I) . . . . . . . . . . . . . . . . . . . . . . . . . . . .C1
[1]BIOL 257 (Anatomy & Physiology I) . . . . . . . . . . . . . . . . . . . . . . . . . . 4

**1st Nursing Semester**
NURS 103 (Fundamental Nursing Care) . . . . . . . . . . . . . . . . . . . . . . . . 9
[1]BIOL 258 (Anatomy & Physiology II) . . . . . . . . . . . . . . . . . . . . . . . . . . 4
[1]ENGL 152 (English Composition II). . . . . . . . . . . . . . . . . . . . . . . . . . . 3

**2nd Nursing Semester**
[1]HLTSC 120 (Pharmacology) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
NURS 105 (Medical Surgical Nursing Care I). . . . . . . . . . . . . . . . . . . . . 5
NURS 110 (Mental Health Nursing Care) . . . . . . . . . . . . . . . . . . . . . . .3.5

**3rd Nursing Semester**
NURS 204 (Obstetrical Nursing Care) . . . . . . . . . . . . . . . . . . . . . . . . . . 4
NURS 205 (Pediatric Nursing Care) . . . . . . . . . . . . . . . . . . . . . . . . . . .3.5
NURS 210 (Nursing Leadership & Management). . . . . . . . . . . . . . . . . . 3

**4th Nursing Semester**
NURS 208 (Medical Surgical Nursing Care II) . . . . . . . . . . . . . . . . . . .8.5
NURS 212 (Nursing Practicum) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .2.5

[1]*Courses may be taken prior to entry into the nursing program.*

### Additional courses to satisfy General Education Graduation Requirements
These courses are not program requirements; however, they must be completed in order to be eligible to graduate from the college. Completion of the degree is necessary to be eligible for licensure as a registered nurse in most states. Students may choose a satisfier course from the college catalog and take the course during a semester of their preference. Suggested semesters to take the courses are listed below.

(C2)      Mathematics Competency[1] (Suggested: 3rd Nursing semester)
(C4)      Computer Literacy Competency[1] (Suggested: 2nd Nursing semester)
(C5)      Human Experience Competency (Suggested: Non-Nursing semester)

[1]*Can be satisfied through accepted placement test scores (Math Competency) or through a competency test (Computer Literacy Competency)*

### Total Degree Requirements          73 maximum
### Total Degree Costs          106.5 billable contact hours maximum

# PHLEBOTOMY TECHNICIAN

## Health Sciences Division

A phlebotomist has a vital role in the healthcare system. Phlebotomists may work in free-standing laboratories, hospitals, clinics, physicians' offices, home care areas and blood donation centers. Additionally, phlebotomists may be cross-trained as patient care technicians. The average annual salary for a phlebotomist according to the Bureau of Labor Statistics (2018) is $34,400.

A phlebotomy technician performs dermal and venipuncture techniques to collect blood specimens necessary in the diagnosis and treatment of a client. In addition to blood collection skills, successful specimen collection requires a phlebotomist to demonstrate competence, professionalism, and good communication and public relations skills. Moreover, the phlebotomist may perform point-of-care testing, obtain non-blood specimens for analysis, process and transport specimens, and maintain safety and quality control procedures. The aforementioned procedures, as well as anatomy and physiology, communication, legal, ethical and professional concepts related to the role of the phlebotomist will be studied in this program.

The phlebotomy certificate program consists of two classes. HLTSC 158 (Phlebotomy Basics) is a six-credit hour course that includes the theory of phlebotomy as well as laboratory skills experience in the classroom. HLTSC 159 (Phlebotomy II) is a four-credit hour course and includes theory, a computer component, a 120-hour clinical externship at a CMS-approved and accredited laboratory facility, and preparation to take the American College for Clinical Pathology national phlebotomy certification exam.

The requirements for a clinical externship include:
1. Passing HLTSC 158 (Phlebotomy Basics) with a grade of "C" or better.
2. HLTSC 158 (Phlebotomy Basics) and HLTSC 159 (Phlebotomy II) must be taken in consecutive semesters. Deviations from this sequence may only be made with appropriate approval of the instructor and division dean offering the course.
3. Immunizations and examinations at the student's expense to ensure that the student can meet the technical standards of the program.
4. An active American Heart Association cardiopulmonary resuscitation (CPR) certificate for professional rescuer of infant, child and adult.
5. Students admitted to health science programs must consent to background/security checks including a criminal background check and drug screening. The student is responsible for any cost associated with the background/security checks. Students that require additional drug testing beyond initial screening and/or medical review may be responsible for associated costs. Certain criminal convictions may render a student ineligible to train at clinical sites which are necessary in order to successfully complete the program. Additionally, certain criminal convictions may render an individual ineligible to take the licensing/certification exam or to be licensed/certified in the State of Michigan. The college will review the results and determine, on a case-by-case basis, whether to deny admission to any individual based on the results of the criminal background check and drug screening. Students that require additional drug testing beyond initial testing and/or a medical review may be responsible for associated costs.

6. Phlebotomy students are required to have professional liability and personal health insurance. The professional liability insurance is provided by the college. Personal health insurance must be obtained by the student and maintained throughout both courses in the program, HLTSC 158 (Phlebotomy Basics) and HLTSC 159 (Phlebotomy II). Proof of insurance will be required prior to participating in any lab or clinical activity.
7. Students who wish to review or enhance phlebotomy skills may elect to take HLTSC 158 (Phlebotomy Basics) and not HLTSC 159 (Phlebotomy II), but a certificate will not be awarded.
8. Students must complete the necessary prerequisites before the beginning of a clinical rotation. Each student must pass both the lab and theory portion of HLTSC 158 (Phlebotomy Basics) with a "C" average (78 percent) or better to be eligible for a phlebotomy externship, HLTSC 159 (Phlebotomy II).
9. The student must complete both HLTSC 158 (Phlebotomy Basics) and HLTSC 159 (Phlebotomy II) with a "C" average or better in order to be awarded the phlebotomy technician certificate.
10. In addition to college rules, phlebotomy technician students are required to adhere to policies and procedures outlined in the Phlebotomy Technician Student Handbook provided in HLTSC 158 (Phlebotomy Basics).Students must be available to work 120 hours in consecutive days as part of the clinical externship which is part of HLTSC 159 (Phlebotomy II). Students must be aware that afternoon shifts cannot be guaranteed for the clinical externship. The clinical externship will be arranged by the phlebotomy instructor in a CMS-regulated laboratory facility. The clinical externship will be completed without monetary compensation.

### Technical Standards

The purpose of the technical standards is to inform students choosing to enter into a health occupation program of the basic minimal technical standard requirements that must be met in order to complete all course work objectives and student outcomes. The listed standards encompass what is minimally required to perform necessary tasks. This list is not exhaustive, and can be modified as the college deems necessary at any time. Students enrolled in a health occupation program at MCCC must provide care that is safe and effective. These technical standards apply to any student enrolling in any one of the health occupations programs. The student must be able to demonstrate sufficient cognitive, professional, motor (physical), sensory, and other abilities, with or without accommodation, to meet program technical standards. Technical standard requirements are listed below. Examples of tasks associated with each requirement and standard are available for review by visiting the Health Sciences Division section of the MCCC website. Prospective students are encouraged to review the Technical Standards for Health Occupational Programs document in its entirety prior to enrolling in or applying to any health occupation course or program.

- **Critical Thinking and Cognitive Competencies:** Sufficient critical thinking and cognitive abilities in classroom and clinical settings.

- **Professionalism:** Interpersonal skills sufficient for professional interaction with a diverse population of individuals, families, and groups.

- **Communication:**
  Communication sufficient for professional interactions.
- **Mobility:**
  Physical abilities sufficient for movement from room to room and in small spaces.
- **Motor Skills:**
  Gross and fine motor abilities which are sufficiently effective and safe for providing allied health care.
- **Sensory:**
  Auditory and visual ability sufficient for observing, monitoring, and assessing health needs.
- **Observation:**
  Ability to sufficiently make observations in a health care environment, consistent with program competencies.
- **Tactile sense:**
  Tactile ability sufficient for physical assessment.

A prospective student or participant in the program with an approved documented disability can request reasonable accommodations to meet these standards. The college will provide appropriate accommodations, but it is not required to fundamentally alter the requirements or nature of the program, or lower its academic standards. Requests for accommodations should be directed to a Disability Services counselor in the Student Success Center. To make an appointment, please call 734.384.4167.

| Required Courses | Credits |
|---|---|
| HLTSC 158 (Phlebotomy Basics) | 6 |
| HLTSC 159 (Phlebotomy II) | 4 |

**Total Certificate Requirements**      **10 credits**

**Total Certificate Cost**      **17 minimum billable contact hours**

# PN TO RN PROGRAM OPTION

## Health Sciences Division

This program option provides an opportunity for students that hold an active, unencumbered license as a practical or vocational nurse to pursue an associate of applied science in nursing degree. Students accepted into the option will complete coursework that prepares them to enter the traditional registered nursing program. Once completed, students transition into the traditional program for the final third and fourth semesters of nursing study. Graduates earn an associate of applied science degree with specialization in nursing and are prepared to function as beginning registered nurses and members of the health care team. Registered nurses are qualified to work in a variety of healthcare settings, including acute care hospitals, outpatient clinics, extended care facilities and physicians' offices. With experience, nurses may also participate in providing skilled care in more specialized areas, including psychiatric units, emergency departments, pediatric and obstetric units, critical care units and home health settings. Job pay is exceptional, averaging $71,700 annually for practicing nurses according to the Bureau of Labor Statistics (2018) and nursing is a flexible and mobile career choice.

### Career Opportunities

Upon program completion, students will be prepared and eligible to apply for licensure in the State of Michigan. Students must meet the Michigan Board of Nursing eligibility requirements and successfully pass the National Council Licensure Exam (NCLEX-RN) in order to become a licensed registered nurse. Students may also be eligible for licensure in other states; students are encouraged to contact a state's board of nursing for eligibility requirements.

### Transfer Information

Upon program completion, students may be eligible to enroll in a RN to BSN completion program. MCCC's RN program has articulation with several four-year university partners. For information regarding transfer opportunities for this or any program, please go to the Transfer section of the college's website.

### Additional Program Information:

This nursing program option is approved by the Michigan Board of Nursing and accredited by the Accreditation Commission for Education in Nursing:  ACEN, 3343 Peachtree Road NE Suite 850, Atlanta, GA 30326, Phone: (404) 975-5000, Fax: (404) 975-5020, www.acenursing.org

### PN to RN Program Option Admission Criteria

Students accepted into the PN to RN program option are chosen according to selective admission criteria. Option applicants must meet established minimum criteria to be considered for admission. Application deadlines will be posted on the program option website. Only applicants who meet established minimum criteria by the deadline will be considered for admission. The potential applicant needs to be aware that meeting minimum standards does not guarantee admission. Seats are limited and determined according to the number of MCCC PN graduates that automatically progress into the option and the number of returning students requesting readmission. Additional candidates will be accepted according to the selection criteria until a cohort is fully enrolled.

Minimum admission criteria and PN to RN program option selection criteria for each application deadline are available for review by visiting the PN to RN section of the MCCC website. Students can also receive application information by contacting the Health Sciences Division Office at 734.384.4102 or by contacting the MCCC Admissions Office at 734.384.4104.

### General Information

1. Recent MCCC practical nursing graduates will have the option to automatically progress into the PN to RN option upon completion of the PN program.  Remaining seats (up to 24) will be offered to past PN graduates and community members meeting minimum eligibility requirements. Applicants will be numerically ranked according to a selective admission criteria to determine who will be offered the remaining seats.

2. All accepted students will complete transition coursework during the summer semester.  Upon completion, students will be separated into two cohorts for completion of the program. Up to 12 students may enroll in core coursework during the fall semester and will complete the PN to RN option at the end of the following winter semester. The remaining 12 students may enroll in core coursework during the winter semester and complete at the end of the following fall semester.

3. Immunizations and examinations at the student's expense to ensure that the student can meet the technical standards of the program.

4. Nursing students are required to have professional liability and personal health insurance. The professional liability insurance is provided by the college. Personal health insurance must be obtained by the student and maintained throughout the program in order to comply with clinical agency requirements. Proof of insurance will be required prior to participating in the first clinical activity.

5. An active American Heart Association cardiopulmonary resuscitation (CPR) certificate for professional rescuer of infant, child and adult.

6. Students admitted to health science programs must consent to background/security checks including a criminal background check and drug screening. The student is responsible for any cost associated with the background/security/drug screening checks. Certain criminal convictions may render a student ineligible to train at clinical sites which are necessary in order to successfully complete the program. Additionally, certain criminal convictions may render an individual ineligible to take the licensing/certification exam or to be licensed/certified in the State of Michigan. The college will review the results and determine, on a case-by-case basis, whether to deny admission to any individual based on the results of the criminal background check and drug screening.

7. Registered nursing at the associate degree level involves the provision of direct care for individuals and families and is characterized by the application of verified knowledge in the skillful performance of nursing functions. Therefore, in order to be considered for admission or to continue in the program, all applicants must be able to meet the health sciences technical standards available in the Nursing, Registered section of the MCCC website.
A prospective student or participant in the program with an approved documented disability can request reasonable accommodations to meet these standards. The college will provide appropriate accommodations, but is not required to fundamentally alter the requirements or nature of the program or lower its academic standards. Requests for accommodations should be directed to a disability services counselor in the Student Success Center. To make an appointment, please call 734.384.4167.

8. Students who successfully complete at least one nursing class must complete the nursing portion of the program within four semesters of the start of the first PN to RN (PNRN) course. Failure to meet the time framework necessitates program dismissal and re-application.

9. All nursing students utilize Internet services and resources to supplement instruction. Students must have reliable internet access. Beginning January 2020, students enrolled in the nursing program will be required to take assessments (ie: exams, quizzes, etc) electronically using an online assessment program called ExamSoft Examplify. Students enrolled in these courses will be required to provide their own computer (including webcam and microphone) that will support the assessment software. The software can be used on most modern Microsoft Windows-based computers and Mac OS X devices. Information related to minimum system requirements can be located by visiting the following links:

   **Windows:** https://examsoft.force.com/emcommunity/s/article/Examplify-Minimum-System-Requirements-for-Windows

   **Mac OS X:** https://examsoft.force.com/emcommunity/s/article/Examplify-Minimum-System-Requirements-for-Mac-OS-X

   Students are encouraged to check with the Health Sciences Division for a complete list of minimum system requirements.

10. Nursing education offered at MCCC is provided in collaboration with multiple clinical partners located in southeast Michigan and northwest Ohio. As a part of these partnerships, MCCC students and faculty are required to meet and follow the policies and procedures of these clinical partners. Given the number of students in the program, the program must be able to place students at any of the clinical agencies for clinical and observational experiences during the course of the program. Students need to be in good standing with all clinical agencies, both as a student and as a member of the community. Therefore, any condition (i.e. criminal history, positive drug screening, unprofessional/unethical behavior, negative employment history) that prevents a student from being placed in any clinical agency during a semester may jeopardize the student's ability to meet the course objectives and may lead to course failure and program dismissal.

11. The student must receive a "C" or better grade in all nursing courses and a "C-" or better grade in all non-nursing courses required in the program plan of study. Failure to meet this requirement may result in the inability to progress to the next semester of the program.

12. Students are expected to maintain a flexible schedule for the nursing program. Clinical assignments vary and are subject to change. This may include any day of the week and any shift, including weekends. On days that are not scheduled for class or clinical, students may be expected to view audiovisual material, study in the skills laboratory, or participate in other on-campus activities. Usually, these activities are self-scheduled. There may be added classes on other days, but students will receive notice of these in advance.

13. In conjunction with requirements set forth by the Michigan Licensing and Regulatory Affairs agency, information related to the student complaint process, career opportunities by state, and licensing requirements by state can be accessed by visiting the following websites: a) Student Complaint Process: found in the Consumer Information section of the MCCC website; b) Career opportunities by state: http://bls.gov/; and c) Licensure requirements by state: https://www.ncsbn.org/14730.htm.

14. In addition to the general college rules, nursing students are required to adhere to policies and procedures outlined in the Nursing Program Student Information Handbook. Students are encouraged to review the handbook prior to application. A copy of the Student Information Handbook is available in the Nursing, Registered section of the MCCC website.

## Technical Standards

The purpose of the technical standards is to inform students choosing to enter into a health occupation program of the basic minimal technical standard requirements that must be met in order to complete all course work objectives and student outcomes. The listed standards encompass what is minimally required to perform necessary tasks. This list is not exhaustive, and can be modified as the college deems necessary at any time. Students enrolled in a health occupation program at MCCC must provide care that is safe and effective. These technical standards apply to any student enrolling in any one of the health occupations programs. The student must be able to demonstrate sufficient cognitive, professional, motor (physical), sensory, and other abilities, with or without accommodation, to meet program technical standards. Technical standard requirements are listed below. Examples of tasks associated with each requirement and standard are available for review by visiting the Health Sciences Division section of the MCCC website. Prospective students are encouraged to review the Technical Standards for Health Occupational Programs document in its entirety prior to enrolling in or applying to any health occupation course or program.

- **Critical Thinking and Cognitive Competencies:**
  Sufficient critical thinking and cognitive abilities in classroom and clinical settings.

- **Professionalism:**
  Interpersonal skills sufficient for professional interaction with a diverse population of individuals, families, and groups.

- **Communication:**
  Communication sufficient for professional interactions.

- **Mobility:**
  Physical abilities sufficient for movement from room to room and in small spaces.

- **Motor Skills:**
  Gross and fine motor abilities which are sufficiently effective and safe for providing allied health care.

- **Sensory:**
  Auditory and visual ability sufficient for observing, monitoring, and assessing health needs.

- **Observation:**
  Ability to sufficiently make observations in a health care environment, consistent with program competencies.

- **Tactile sense:**
  Tactile ability sufficient for physical assessment.

*See item No. 7 under "General Information" for information regarding accommodations.*

|  | **Required General Education Courses** | **Credits**<br>**20** |
|---|---|---|
| C1 | BIOL 151 (Biological Sciences I) | 4 |
| C2 | Mathematics Competency | 4 |
| C3 | ENGL 151 (English Composition I) | 3 |
| C4 | Computer Literacy Competency | 3 |
| C5 | Expressions of the Human Experience Competency | 3 |
| C6 | PSYCH 151 (General Psychology) | 3 |

*See the General Education Requirements in the college catalog or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

### Required Courses and Sequence                Credits

**Pre-Admission Course Requirements**

| | |
|---|---|
| ENGL 151 (English Composition I) | C3 |
| PSYCH 151 (General Psychology) | C6 |
| BIOL 151* (Biological Sciences I) | C1 |
| BIOL 257 (Anatomy & Physiology I) | 4 |
| BIOL 258 (Anatomy & Physiology II) | 4 |

One of the following**:
| | |
|---|---|
| ENGL 152 (English Composition II) | 3 |
| HLTSC 120 (Pharmacology) | 3 |

**Summer Semester**
| | |
|---|---|
| PNRN 100 (LPN Transition to RN Practice) | 3 |
| ENGL 152 (English Composition II)<br>  or HLTSC 120 (Pharmacology) | 3 |
| PNRN 110 (Mental Health Nursing Care for the LPN) | 3.5 |

**Fall PN to RN Cohort**

**Fall Semester**
| | |
|---|---|
| NURS 204 (Obstetrical Nursing Care) | 4 |
| NURS 205 (Pediatric Nursing Care) | 3.5 |
| NURS 210 (Nursing Leadership & Management) | 3 |

**Winter Semester**
| | |
|---|---|
| NURS 208 (Medical Surgical Nursing Care II) | 8.5 |
| NURS 212 (Nursing Practicum) | 2.5 |

**OR**

**Winter PN to RN Cohort**

**Fall Semester**
No required courses; Gen Ed or non-nursing courses if aplicable

**Winter Semester**
| | |
|---|---|
| NURS 204 (Obstetrical Nursing Care) | 4 |
| NURS 205 (Pediatric Nursing Care) | 3.5 |
| NURS 210 (Nursing Leadership & Management) | 3 |

**Summer Semester**
No required courses; Gen Ed or non-nursing courses if aplicable

**Fall Semester**
| | |
|---|---|
| NURS 208 (Medical Surgical Nursing Care II) | 8.5 |
| NURS 212 (Nursing Practicum) | 2.5 |

*\* Prerequisite to BIOL 257 (Anatomy & Physiology I); not a program required course.*

*\*\* Students must complete either ENGL 152 (English Composition II) or HLTSC 120 (Pharmacology) or equivalent prior to application. The remaining course is required during the summer semester, unless previously completed.*

### Additional courses to satisfy General Education Graduation Requirements

These courses are not program requirements; however, they must be completed in order to be eligible to graduate from the college. Students may choose a satisfier course from the college catalog and take the course during a semester of their preference. Suggested semesters to take the courses are listed below.

(C2)     Mathematics Competency[1] (Suggested:  Fall semester)
(C4)     Computer Literacy Competency[1] (Suggested:  Summer semester)
(C5)     Human Experience Competency (Suggested:  Pre-Admission)

*[1]Can be satisfied with qualifying score on accepted placement test (Math Competency) or through a competency test (Computer Literacy Competency)*

| **Total Degree Requirements** | **62 maximum** |
|---|---|
| **Total Degree Costs** | **87 billable contact hours maximum** |

# RENEWABLE ENERGY

## Applied Science and Engineering Technology Division

Renewable energy is one of the fastest growing industries in Michigan and the U.S. Michigan is poised to become a major force in renewable energy technologies, with jobs ranging from entry level assembly, production and installation to technician-level maintenance, support and operation. Career opportunities within the field are also emerging in technical sales and marketing, office and business management, and engineering design. Renewable energy jobs require special knowledge and training that is just becoming available because the industry is so new and continues to evolve so rapidly. The job market is made up of both large multi-national companies that typically require apprenticeships or formal degrees, as well as a significant number of smaller family-owned and operated businesses and service providers. These smaller contractors represent opportunities for people who have acquired the proper skills to find useful work at reasonable pay.

The renewable energy field is expected to create major job growth during the next several years, and demand for trained qualified individuals is expected to remain high. These are well-paying technical jobs that cannot be exported overseas.

MCCC offers several paths into a renewable energy career:

1. Individual specialty classes for the small business owner or skilled tradesperson wishing to add specific skills to an existing business or career.
2. Certificates in wind energy and solar energy showing basic, entry-level knowledge. MCCC recognizes that many employers place value on certificates which show specialized education and training in a particular job skill. These certificates concentrate on the basic core courses with skill development and job upgrading being the primary objectives. Each certificate can be completed in just two or three semesters. And, since the basic core courses are the same, it is possible to complete both certificates with some additional course work.
3. A formal two-year associate of applied science degree in electronics with a specialization in renewable energy is planned for the near future.

## Certificate Program: Solar Energy

This certificate concentrates on the basic core competencies required to prepare the student for entry-level positions in the solar energy field.

### Career Opportunities

Graduates of this program will be prepared for entry-level employment in the following areas:

- Associate sales technician
- Energy systems technician (wind and solar)
- Renewable energy technician
- Solar photovoltaic technician
- Solar service technician
- Site survey technician (solar)

### Required Courses — Credits

| Course | Credits |
|---|---|
| CONM 101 (Materials of Construction) | 3 |
| ELEC 125 (Fundamentals of Electricity) | 3 |
| ELEC 127 (AC/DC Motors) | 3 |
| ELEC 132 (Electronics I) | 4 |
| ELEC 156 (Introduction to Renewable Energy) | 3 |
| ELEC 157 (Introduction to Solar Energy) | 3 |
| ELEC 214 (National Electric Code) | 2 |
| ELEC 257 (Applied Solar Photovoltaics) | 3 |
| MATH 119 (Elementary Technical Mathematics) | 2 |

**Total Certificate Requirements** — **26 credits**

**Total Certificate Cost** — **34 minimum billable contact hours**

## Certificate Program: Wind Energy

This certificate concentrates on the basic core competencies required to prepare the student for entry-level positions in the wind renewable energy field.

### Career Opportunities

Graduates of this program will be prepared for entry-level employment in the following areas:

- Energy Systems Technician (Wind & Solar)
- Senior buyer
- Senior property agent
- Senior risk management analyst
- Site prospector
- Site supervisor
- Wind data analyst
- Wind energy forecasting and resource assessment
- Wind field technician
- Wind plant administrator
- Wind plant monitoring technician

### Required Courses — Credits

| Course | Credits |
|---|---|
| CONM 101 (Materials of Construction) | 3 |
| ELEC 125 (Fundamentals of Electricity) | 3 |
| ELEC 127 (AC/DC Motors) | 3 |
| ELEC 132 (Electronics I) | 4 |
| ELEC 156 (Introduction to Renewable Energy) | 3 |
| ELEC 158 (Introduction to Wind Energy) | 3 |
| ELEC 214 (National Electric Code) | 2 |
| MATH 119 (Elementary Technical Mathematics) | 2 |

**Total Certificate Requirements** — **23 credits**

**Total Certificate Cost** — **30 minimum billable contact hours**

# RESPIRATORY THERAPY

## Health Sciences Division

Respiratory therapy, or respiratory care, is an allied health profession specializing in cardiopulmonary diseases. A respiratory therapist can be instrumental in assisting in the diagnosis, treatment and prevention of a wide spectrum of disorders affecting the heart and lungs.

A registered respiratory therapist (RRT) requires a minimum of a two-year degree and most RRTs work in a hospital. Monroe County Community College graduates of the respiratory therapy program exceed the national averages for success on board exams.

Future employment for registered respiratory therapists is considered excellent nationwide. According to the Bureau of Labor Statistics (2018), the average annual salary for a respiratory therapist is approximately $60,300.

Graduate therapists are prepared to:

- Assume basic or advanced respiratory care positions in hospitals, nursing homes, sub-acute care centers, rehabilitation facilities, long-term care facilities, home care companies, asthma clinics, sleep disorders laboratories and pulmonary function laboratories;
- Continue higher education, if desired.

### Transfer Information

For information regarding transfer opportunities for this, or any program, please visit the Transfer section of the MCCC website.

### Additional Program Information

The Monroe County Community College respiratory therapy program is accredited by the Commission on Accreditation for Respiratory Care (CoARC). Interested parties may contact CoARC or visit the website, www.coarc.com.

### Admission Criteria

Applicants to the respiratory therapy programs are encouraged to apply prior to completing pre-requisites.

Admission requirements are subject to change. A student must meet the admission requirements in effect for the class and year students are entering. The program follows a selective admission process. To be eligible for evaluation and selection, all required information must be included in the student's folder by the application deadline, which is the second Monday in June of the year the student wishes to enter the respiratory therapy program. Applicants enrolled in any pre-requisite classes that finish after the application deadline but before the start of fall semester may still be considered for admission to the program contingent upon completion with "C" or better in the missing pre-requisite class(es).

For a student to be considered for the program, the MCCC Division of Health Sciences requires:

1. Graduation from high school or successful completion of the GED (General Education Development) test or an eligible middle college student. Official transcripts from high school must be sent to the MCCC Admissions and Guidance Office. Official transcripts from all colleges or universities, if transfer credit is desired, must be sent directly to the MCCC Registrar's Office.
2. MELAB (80 percentile) or IBN TOEFL (79-80) tests may be required to show proof of English language proficiency for individuals whose native language is not English.
3. Completion of BIOL 257 (Anatomy and Physiology I) or MCCC equivalent. Anatomy and Physiology must be repeated if it has not been taken within 10 years of the application deadline. Exceptions are at the discretion of the program director. Students who have taken anatomy and physiology at another accredited institution of higher learning that does not transfer as equivalent to the MCCC course will have their course(s) evaluated on an individual basis.
4. Completion of MATH 151 (Intermediate Algebra) or higher level course, with a "C" or better or an acceptable qualifying score on an accepted college placement test; completed within 10 years. Students with an interest in pursuing a bachelor degree following completion of the MCCC respiratory therapy program are encouraged to meet with an academic advisor or meet with the program director to determine which math course will be required at the higher level to avoid additional coursework.
5. The student must receive a "C" or better grade in all respiratory therapy courses and a "C-" or better grade in all non-respiratory therapy courses required in the program plan of study. Respiratory and required support courses must be completed in the order outlined in the program's plan of study (see course sequence for requirements.) Failure to meet the requirement may result in the inability to progress to the next semester of the program.
6. Immunizations and examinations at the student's expense to ensure that the student can meet the technical standards of the program.
7. An active American Heart Association cardiopulmonary resuscitation (CPR) certificate for professional rescuer of infant, child and adult.
8. Students admitted to health science programs must consent to background/security checks including a criminal background check and drug screening. The student is responsible for any cost associated with the background/security checks/drug screening. Certain criminal convictions may render a student ineligible to train at clinical sites which are necessary in order to successfully complete the program. Additionally, certain criminal convictions may render an individual ineligible to take the licensing/certification exam or to be licensed/certified in the State of Michigan. The college will review the results and determine, on a case-by-case basis, whether to deny admission to any individual based on the results of the criminal background check and drug screening.
9. Respiratory therapy students are required to have professional liability and personal health insurance. The professional liability insurance is provided by the college. Personal health insurance must be obtained by the student and maintained throughout the program in order to comply with clinical agency requirements. Proof of insurance will be required prior to participating in the first clinical activity.
10. Respiratory care involves the provision of direct care for individuals and families and is characterized by the application of verified knowledge in the skillful performance of respiratory therapist functions. Therefore, in order to be considered for admission or to continue in the program, all applicants must be able to meet the health sciences technical standards available in the Health Sciences Division section of the MCCC website. A prospective student or participant in the program with an

approved documented disability can request reasonable accommodations to meet these standards. The college will provide appropriate accommodations but is not required to fundamentally alter the requirements or nature of the program, or lower its academic standards. Requests for accommodations should be directed to a disability services counselor in the Student Success Center. To make an appointment, please call 734.384.4167.

11. All respiratory therapy students utilize Internet services and resources to supplement instruction. Students must have reliable internet access. Beginning January 2020, students enrolled in the respiratory therapy program will be required to take assessments (i.e., exams, quizzes, etc.) electronically using an online assessment program called ExamSoft Examplify. Students enrolled in these courses will be required to provide their own computer (including webcam and microphone) that will support the assessment software. The software can be used on most modern Microsoft Windows-based computers and Mac OS X devices. Information related to minimum system requirements can be located by visiting the following links:
**Windows:** https://examsoft.force.com/emcommunity/s/article/ Examplify-Minimum-System-Requirements-for-Windows
**Mac OS X:** https://examsoft.force.com/emcommunity/s/article/ Examplify-Minimum-System-Requirements-for-Mac-OS-X

Students are encouraged to check with the Health Sciences Division for a complete list of minimum system requirements.

12. Selection of qualified respiratory therapy applicants is done through a numerical process. Meeting the minimum requirements for admission does not ensure admission to the program. Applicants to the program tend to be well qualified and up to 30 candidates are selected each year. For specific information on the point-based selection criteria, please contact the Admissions and Guidance Office or the respiratory therapy program director.

13. In conjunction with requirements set forth by the Michigan Licensing and Regulatory Affairs agency, information related to the student complaint process, career opportunities by state, and licensing requirements by state can be accessed by visiting the following websites: a) Student Complaint Process: found in the Consumer Information section of the MCCC website; b) Career opportunities by state: https://bls.gov/; and c) Licensure requirements by state: https://www.nbrc.org/resources/#state-licensing.

14. In addition to the general college rules, respiratory therapy students are required to adhere to policies and procedures outlined in the Respiratory Therapy Student Information Handbook. Students are encouraged to review the handbook prior to application. A copy of the Student Information Handbook is available in the Health Sciences Division section of the MCCC website.

*See item No. 10 under "General Information" for information regarding accommodations.*

## Technical Standards

The purpose of the technical standards is to inform students choosing to enter into a health occupation program of the basic minimal technical standard requirements that must be met in order to complete all course work objectives and student outcomes. The listed standards encompass what is minimally required to perform necessary tasks. This list is not exhaustive, and can be modified as the college deems necessary at any time. Students enrolled in a health occupation

program at MCCC must provide care that is safe and effective. These technical standards apply to any student enrolling in any one of the health occupations programs. The student must be able to demonstrate sufficient cognitive, professional, motor (physical), sensory and other abilities, with or without accommodation, to meet program technical standards. Technical standard requirements are listed below. Examples of tasks associated with each requirement and standard are available for review by visiting the Health Sciences Division section of the MCCC website. Prospective students are encouraged to review the Technical Standards for Health Occupational Programs document in its entirety prior to enrolling in or applying to any health occupation course or program.

- **Critical Thinking and Cognitive Competencies:**
  Sufficient critical thinking and cognitive abilities in classroom and clinical settings.

- **Professionalism:**
  Interpersonal skills sufficient for professional interaction with a diverse population of individuals, families, and groups.

- **Communication:**
  Communication sufficient for professional interactions.

- **Mobility:**
  Physical abilities sufficient for movement from room to room and in small spaces.

- **Motor Skills:**
  Gross and fine motor abilities which are sufficiently effective and safe for providing allied health care.

- **Sensory:**
  Auditory and visual ability sufficient for observing, monitoring, and assessing health needs.

- **Observation:**
  Ability to sufficiently make observations in a health care environment, consistent with program competencies.

- **Tactile sense:**
  Tactile ability sufficient for physical assessment.

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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

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|  |  | **Credits** |
|---|---|---|
| **Required General Education Courses** | | **20** |
| C1 | BIOL 151 (Biological Sciences I) . . . . . . . . . . . . . . . . . . . . . . . . . . | 4 |
| C2 | MATH 151 (Intermediate Algebra) | |
| | or competency . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 4 |
| C3 | ENGL 151 (English Composition I) . . . . . . . . . . . . . . . . . . . . . . . . | 3 |
| C4 | Computer Literacy Competency . . . . . . . . . . . . . . . . . . . . . . . . . . | 3 |
| C5 | Expressions of the Human Experience Competency . . . . . . . . . . | 3 |
| C6 | Social Systems Competency . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 3 |

*See the General Education Requirements in the college catalog or on the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

**Pre-Admission** | **Credits**

MATH 151 (Intermediate Algebra or higher) . . . . . . . . . . . . . . . . . . . . . . C2
BIOL 151 (Biological Sciences I) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . C1
BIOL 257 (Anatomy & Physiology I) . . . . . . . . . . . . . . . . . . . . . . . . . . . 4

**Fall Semester (1st)**

RTH 100 (Respiratory Care Techniques I) . . . . . . . . . . . . . . . . . . . . . . .6.5
RTH 102A (Pharmacology for Respiratory Therapists I). . . . . . . . . . . . . 2
RTH 104 (Cardiopulmonary Assessment) . . . . . . . . . . . . . . . . . . . . . . . 3
BIOL 258** (Anatomy & Physiology II) . . . . . . . . . . . . . . . . . . . . . . . . . 4

**Winter Semester (2nd)**

RTH 102B (Pharmacology for Respiratory Therapists II) . . . . . . . . . . . . 1
RTH 110 (Respiratory Care Techniques II) . . . . . . . . . . . . . . . . . . . . . . . 5
RTH 111 (Respiratory Care Clinical Practice I). . . . . . . . . . . . . . . . . . .4.5
RTH 116 (Cardiopulmonary Pathophysiology) . . . . . . . . . . . . . . . . . . . 4

**Summer Semester (3rd)**

RTH 120 (Respiratory Care Techniques III) . . . . . . . . . . . . . . . . . . . . . . 4
RTH 121 (Respiratory Care Clinical Practice II) . . . . . . . . . . . . . . . . . . . 2
[1] Computer Literacy Competency* (suggested semester) . . . . . . . . . .C4
Writing Competency* (suggested semester) . . . . . . . . . . . . . . . . . . . . .C3

**Fall Semester (4th)**

RTH 211 (Respiratory Care Clinical Practice III). . . . . . . . . . . . . . . . .4.5
RTH 212 (Advanced Cardiopulmonary Physiology) . . . . . . . . . . . . . . . 4
RTH 214 (Adult Critical Care) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
RTH 216 (Neonatal/Pediatric Critical Care) . . . . . . . . . . . . . . . . . . . . . 2

**Winter Semester (5th)**

RTH 221 (Respiratory Care Clinical Practice IV) . . . . . . . . . . . . . . . . . 4
RTH 222 (Seminar). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2
RTH 226 (Respiratory Care Techniques IV) . . . . . . . . . . . . . . . . . . . . . 2
Human Experience Competency*(suggested semester) . . . . . . . . . . . C5
Social Systems Competency* (suggested semester). . . . . . . . . . . . . . .C6

*\* General Education requirement. Suggested as a pre-admission course;*
*however, not required to be completed prior to application.*
*\*\* Required non-respiratory course: must be completed in the order presented*
*above or prior to the semester indicated.*
*[1]Can be satisfied through a competency test (Computer Literacy Competency)*

## Total Degree Requirements        71.5-84.5 credits
## Total Degree Cost        119-128 minimum billable
## contact hours

# TEACHER PARAPROFESSIONAL
## (Elementary Education)

### Science/Mathematics Division

The elementary education associate of applied science degree program prepares students to provide high-quality education to children in grades K-12. This degree program prepares students for a career in education or transfer into an elementary education program at a 4 year college or university. The first two years of instruction in a bachelor's degree program in elementary education are met. Please work in coordination with your advisor and planned transfer institution to ensure transferability.

> 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** |  | **19-22** |
| C1 | Natural Science Competency | 4 |
| C2 | MATH 151 (Intermediate Algebra) or higher | 3-6* |
| C3 | ENGL 151 (English Composition I) | 3 |
| C4 | Computer Literacy Competency | 3 |
| C5 | ENGL 256 (Children's Literature) | 3 |
| C6 | POLSC 151 (Introduction to Pollitical Science) | 3 |

*Students intending to transfer to a four year elementary education program are advised to take MATH 156 (Math for Elementary Teachers I) and MATH 166 (Math for Elementary Teachers II).*

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | Credits |
|---|---|
| **Required Core Courses** | **38-41** |
| ECE 102 (Child Growth and Development) | 3 |
| ECE 110 (Diverse Populations in Early Childhood Education) | 3 |
| EDUC 151 (Exploring Teaching) | 3 |
| EDUC 158 (Art for Elementary Teachers) | 3 |
| EDUC 165 (Music for Elementary Teachers) | 3 |
| ENGL 152 (English Composition II) | 3 |
| GEOG 152 (World Regional Geography) | 3 |
| HIST 154 (History of the US 1607-1877) | 3 |
| HPE 151 (First Aid and Safety) | 2 |
| SPCH 151 (Communication Fundamentals) | 3 |
| 9-12 credits in comprehensive major/minor area | 9-12 |

| | |
|---|---|
| **Total Degree Requirements** | **60 credits** |
| **Total Degree Cost** | **62 minimum billable contact hours** |

# WELDING TECHNOLOGY

## Applied Science and Engineering Technology Division

The associate of applied science degree with specialization in welding technology parallels the high technological demands in the joining and fabrication areas of manufacturing industries. The welding laboratory contains state-of-the-art equipment for Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Flux Cored Arc Welding (FCAW), Gas Tungsten Arc Welding (GTAW), as well as multiple thermal cutting process applications. The subject matter and laboratory experiences in the welding technology program provide training for the serious welding technologist, with emphasis on welding skill development, welding metallurgy, weldment evaluation and testing, and related technical courses. A pathway to certification in nondestructive testing (NDT) is also available for students interested in weld inspection. Students can take individual NDT courses or pursue the entire certificate for additional credentials. The MCCC welding technology program articulates with Ferris State University's four-year degree program.

Certificate programs are also available for students interested in rapid skills development with an accelerated pathway into the welding industry. MCCC offers both beginning and advanced welding certificates as well as offers AWS SENSE QC-10 and QC-11 welding process certifications. MCCC also has been a certified MDOT testing facility for the past five years.

### Career Opportunities

Students are prepared for many welding-related careers and trades, including welding inspection, sales, service, design, maintenance and engineering. The college offers state and American Welding Society welder certification testing. Graduates of this program will be prepared for entry-level employment in the following areas:

- Engineering technician
- Pipefitter
- Production welder
- Weld inspector
- Welder/fabricator
- Welding metallurgy technician
- Welding sales/service technician

> 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 | Human Experience Competency | 3 |
| C6 | Social Systems Competency | 3 |

*See the General Education Requirements on page 33 or the college website (www.monroeccc.edu) for a list of courses that satisfy the General Education Learning Competencies.*

|  | Credits |
|---|---|
| **Required Core Courses** | **43** |
| **1st Semester** | |
| MATL 101 (Industrial Materials) | 3 |
| WELD 100 (Introduction to Welding Processes) | 4 |
| MATH 119* (Elementary Technical Mathematics) | 2 |
| **2nd Semester** | |
| WELD 110 (Welding Symbols and Blueprint Reading) | 2 |
| WELD 114 (GMAW and GTAW Applications) | 6 |
| MATH 124* (Technical Mathematics II) | 4 |
| **3rd Semester** | |
| METC 220 (Statics & Strength of Materials) | 4 |
| WELD 102 (Advanced SMAW) | 6 |
| WELD 103 (Weldment Evaluation and Testing) | 3 |
| **4th Semester** | |
| WELD 105 (Welding Metallurgy) | 3 |
| WELD 106 (Basic Pipe Welding) | 6 |
| **Summer** | |
| WELD 216 (Basic Pipefitting) | 4 |

| **Total Degree Requirements** | **64 credits** |
|---|---|
| **Total Degree Cost** | **83 minimum billable contact hours** |

*\* 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.*

## Welding Technology Certificate Programs

The college offers two levels of certificate programs in welding. The basic certificate is oriented toward developing those skills required for entry level jobs in the welding field. The advanced certificate program is also a skills intensive program but takes students through higher-level skill proficiencies, utilizing additional welding procedures and applications. All courses taken in the certificate program are applicable toward the associate of applied science degree.

## Certificate Program: Basic Welding*

|  | Credits |
|---|---|
| WELD 100 (Introduction to Welding Processes) | 4 |
| WELD 102 (Advanced SMAW) | |
| or WELD 114 (GMAW and GTAW Applications) | 6 |
| WELD 103 (Weldment Evaluation and Testing) | 3 |
| WELD 110 (Welding Symbols and Blueprint Reading) | 2 |

| **Total Certificate Requirements** | **15 credits** |
|---|---|
| **Total Certificate Cost** | **20 minimum billable contact hours** |

*\*This certificate is not federal financial aid eligible.*

## Certificate Program: Advanced Welding

                                                                      **Credits**

MATL 101 (Industrial Materials) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
WELD 100 (Introduction to Welding Processes). . . . . . . . . . . . . . . . . . . 4
WELD 102 (Advanced SMAW)
    or WELD 114 (GMAW and GTAW Applications) . . . . . . . . . . . . . . . . 6
WELD 103 (Weldment Evaluation and Testing) . . . . . . . . . . . . . . . . . . . 3
WELD 105 (Welding Metallurgy). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
WELD 216 (Basic Pipefitting) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
WELD 110 (Welding Symbols and Blueprint Reading) . . . . . . . . . . . . . . 2

**Total Certificate Requirements**           **25 credits**
**Total Certificate Cost**           **34 minimum billable**
                                                      **contact hours**

## American Welding Society Certification

The college also offers course work to prepare students to qualify for American Welding Society certification at entry and advanced levels of proficiency. In addition to verification of skill levels to national standards, AWS certification also includes nationwide registry in the AWS bank. Equivalencies to associate of applied science degree requirements in welding are available upon completion of the certifications. See the division dean or welding instructor for further details.

## American Welding Society (AWS) Entry Level Welding Certification (conforms to AWS-QC-10 standard)

WELD 115 (Entry Level Welding) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12

**Total Certificate Requirements**           **12 credits**
**Total Certificate Cost**           **16.67 minimum billable**
                                                      **contact hours**

## American Welding Society (AWS) Advanced Level Welding Certification (conforms to AWS-QC-11 standard)

WELD 215 (Advanced Level Welding) . . . . . . . . . . . . . . . . . . . . . . . . . . 12

**Total Certificate Requirements**           **12 credits**
**Total Certificate Cost**           **16.67 minimum billable**
                                                      **contact hours**