



**QUINSIGAMOND**  
Community College

# Manufacturing Technology – Associate in Science: Program Narrative & Grid

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2012-2013  
QUINSIGAMOND COMMUNITY COLLEGE

**DEGREE PROGRAM OR CERTIFICATE REVISION PROPOSAL**

Program: Manufacturing Technology
Division: Business And Technology
Degree type: Associate In Science
Provide a detailed list of the proposed changes to the program. 1. Move ENG 101 from semester 1 to semester 2 2. Move MNT 101 from semester 2 to semester 1 3. Remove ELT 103 from program (semester 2) 4. Move MNT 115 from semester 3 to semester 2 and reflect new course title 5. Move ENG 102 from semester 2 to semester 3 6. Remove MAT 122 as an option (semester 2) 7. Remove MNT 105 from semester 2 and replace with MNT 106 8. Add MNT 100 to semester 1 9. Add MNT 108 to semester 2
Attachments: <input checked="" type="checkbox"/> Current program grid <input checked="" type="checkbox"/> Proposed program grid
Submit separate proposals for any new courses or revised courses in the program.  MNT 106 Manufacturing Quality Assurance & Control Techniques – New course MNT 100 Manufacturing Safety – New Course MNT 115 Instrumentation in Manufacturing – Course Revision
Provide a rationale for the proposed changes.  These changes reflect industry need for nationally recognized skill standards - Manufacturing Skill Standards Council – Certified Production Technician program, ACT, Society of Manufacturing Engineers, National Association of Manufacturers. The intent of the new program is to provide an accelerated and credentialed certificate, supporting student entry into a variety of positions within the manufacturing industry. These changes represent curriculum design that supports national and state wide skills standards from MSSC-CPT (Manufacturing Skill Standards Council- Certified Production Technician) and MACWIC (Massachusetts Career Workforce Innovation Collaborative – Applied Manufacturing Technology Certification).
Do any of the proposed changes affect the program goals, the program student learning outcomes, or the course mapping of the General Education Learning Outcomes? If so please provide the revisions.  No

## MANUFACTURING TECHNOLOGY - Associate in Science

### Program Goals

The Manufacturing Technology program is designed to prepare graduates to enter the field of advanced manufacturing. Students will gain an understanding of materials and manufacturing processes as well as the quality systems in place in modern industry. Using safe working practices, students will learn to operate and maintain a variety of production equipment. Since there is a strong focus on applied mathematical and scientific knowledge in advanced manufacturing, students will obtain an advanced understanding of electrical, pneumatic, and hydraulic systems. Use of PC's, communication skills, CNC machine tools, and CAD/CAM software will allow successful graduates to enhance their ability to add value to any manufacturing environment. Graduates will be able to apply lean principles and automation techniques to improve process and product efficiency and quality.

### Student Learning Outcomes

Upon completion of the program graduates will be able to:

- Be able to apply mathematical and scientific concepts to solve manufacturing problems.
- Understand the process of product development through design and experimentation.
- Supervise and manage a variety of manufacturing systems.
- Work in multicultural and multidisciplinary teams to assess and improve system performance.
- Practice safe working protocols to nurture ethical responsibilities.
- Communicate technical information both verbally and in written form.
- Use modern tooling, skills, and techniques for effective manufacturing systems practice.
- Understand the behavior of a variety of material properties as they relate to manufacturing processing.
- Apply accurate design methodology and use industry standard CAD/CAM software to improve quality and production.
- Identify problems before they occur and design a solution.
- Understand and manage product variability as defined by quality systems.
- Apply advanced methods of analysis, synthesis, and control of manufacturing systems.
- Safely operate, program, and setup a variety of CNC equipment.
- Measure manufacturing process variables and draw credible technical conclusions.
- Apply lean principles in the operation and development of production systems.

### Admissions Process

Admissions inquiries should be directed to [admissions@gcc.mass.edu](mailto:admissions@gcc.mass.edu). Prospective students may apply to the program of their choice by following the enrollment steps at the following link: [http://www.qcc.edu/pages/Enrollment\\_Steps.html](http://www.qcc.edu/pages/Enrollment_Steps.html).

### Admissions Requirements

High School Diploma or GED/High School Equivalency

Students should note that some first semester courses carry minimum prerequisites. Refer to the program grid.

### CORI, SORI, Finger Printing & Drug Testing

A Criminal Offenders Record Information (CORI) and Sexual Offenders Record Information (SORI) are not required. Finger printing and drug testing are not required. However, CORI/SORI, finger printing and drug testing may be required of students enrolled in MNT 299.

### Additional Cost

See page 30 for program fees for this program. (Note: Not all programs have program fees).

Graduates may be required to meet at locations off campus and are expected to provide their own transportation to these venues. Types of venues used vary each semester, but may include company tours outside of class and/or training at other local educational facilities.

### Location

This program may be completed at the QCC Worcester campus. Please note that other local locations may be used to enhance the educational experience of the student.

This program may be completed face-to-face.

This program may be completed less than 50% on-line.

### Technical Performance Standards

See page 17 for technical standards for this program. (Note: Not all programs have technical performance standards).

### Credit for Prior Learning

Students enrolled in this program may be able to earn academic credit for prior learning. Please contact the office of Career Placement Services at [careerservices@gcc.mass.edu](mailto:careerservices@gcc.mass.edu), 508.854.4439, Room 272 A. To evaluate technical prior learning credit the student should contact the program coordinator.

### Career Outlook

Please consult The Massachusetts Career Information System at <http://masscis.intocareers.com/> or The Occupational Outlook Handbook at <http://www.bls.gov/oco/> for specific occupational information. The CIP code for this program is 15.0613.

**Transfer Articulations & Opportunities**

Prospective students may learn more about transfer articulation agreements at the following link: <http://www.qcc.mass.edu/transfer/ArticPathways.html>. More information regarding transfer opportunities is available at: <http://www.qcc.mass.edu/transfer>

**Program Contact:** [Manufacturing@qcc.mass.edu](mailto:Manufacturing@qcc.mass.edu)

**Additional Program Information:** For the most up to date information, go to the program website at [www.QCC.edu](http://www.QCC.edu).

- The courses in this program are aligned with national standards as set by National Association of Manufacturers (NAM), Manufacturing Skills Standards Council (MSSC), and the statewide standards as defined by the Massachusetts Advancement Center Workforce Innovation Collaborative (MACWIC).
  - Students that successfully complete curriculum requirements may elect to register for the following certification examinations: MACWIC Level 1 and Level 2; SME CmfGT exam.
  - Students will take the Solidworks CSWA certification exam as part of curricular requirements in MNT 103.

**Certifications:**

Manufacturing Skills Standards Council - Certified Production Technician (MSSC - CPT). <http://www.msscusa.org/production-certification-cpt/>

National Association of Manufacturers (NAM). <http://www.nam.org/>

Massachusetts Advancement Center Workforce Innovation Collaborative (MACWIC). <http://www.macwic.org/>

Society of Manufacturing Engineers - Certified Manufacturing Technologist (SME - CMfgT). <http://www.sme.org/certified-manufacturing-technologist-certification.aspx>

Certified Solidworks Associate - (CSWA). [http://www.solidworks.com/sw/support/796\\_ENU\\_HTML.htm?pid=446](http://www.solidworks.com/sw/support/796_ENU_HTML.htm?pid=446)

### MANUFACTURING TECHNOLOGY - Associate in Science (Program Code: MP)

Course Title	Course #	Offered	Plan to Take	Grade	Credits	Prerequisites
<b>Semester 1</b>						
Introduction to Computer Applications	CIS 111	F/S/SU			3	MAT 100 or approp place score
College Mathematics I: Pre-Calculus	MAT 123	F/S/SU			3	
Mechanical CAD I	MNT 101	F/S			3	
Manufacturing Processes I	MNT 110	F			3	
Manufacturing Safety	MNT 100	F			3	
<b>Semester 2</b>						
English Composition and Literature I	ENG 101	F/S/SU			3	ENG 100 or approp place score
College Mathematics II: Trigonometry	MAT 124	F/S/SU			3	MAT 123
Manufacturing Quality Assurance & Control Techniques	MNT106	S			4	MNT 101
Liberal Arts Elective	---	F/S/SU			3	
Maintenance & Instrumentation in Manufacturing	MNT 115	S			3	MNT 110
<b>Semester 3</b>						
English Composition & Literature II	ENG 102	F/S/SU			3	ENG 101
Solid Modeling	MNT 103	F/S			3	MNT 101
Process Automation & Robotics	MNT 217	F			3	CIS 111, MNT 110
Physics I	PHY 101	F/S/SU			4	Coreq: MAT 124
Computer Numerical Control <u>or</u> Elective*	MNT 210	F			3-4	MNT 101
	---	F/S/SU				
<b>Semester 4</b>						
Fundamentals of Computer-Aided Manufacturing	MNT 215	S			4	MNT 102 or MNT 103, MNT 210
Manufacturing Processes II	MNT 216	S			4	MNT 102 or MNT 103, MNT 210, Coreq: MNT 215
Lean Manufacturing & Six Sigma	MNT 218	S			3	CIS 111, MNT 110
Cooperative Work Experience and Seminar** <u>or</u> Elective*	MNT 299	F/S/SU			3	Approval of Program Coordinator
Physics II	PHY 102	S			4	PHY 101
<b>Total Credits Required</b>					<b>65-66</b>	

#### Program Notes:

- Students should note that many required courses have ENG and/or MAT prerequisites.

\*Suggested electives: Students must select from the following list of courses: BIO, CHM, MAT, MNT, PHY, PSY, or SPH; or the following suggested courses: MGT 211, MGT 221, MRK 201, MRK 221; or a course approved by the Program Coordinator.

\*\*It is recommended that students register for MNT 299 in their final semester to gain vital work experience prior to program completion.