

**QUINSIGAMOND COMMUNITY COLLEGE
REQUEST FOR COURSE-EQUIVALENCY CREDIT
ARTICULATION REVIEW FORM**

Thank you for your interest in partnering with Quinsigamond Community College.
Please answer the items below as completely as possible. Should you need assistance, do not hesitate to
call our office at (508) 854-4439.

Title of Sponsoring Agency's Course: MNT 110 and MNT 115 Equivalency

Summarize the overall goal of this course and attach a syllabus:

This course examines advanced manufacturing processes and occupations, with a focus on machine operators. Students learn a variety of manufacturing processes including precision inspection and measurement, forging and casting, and powder metal processing. Students gain an understanding of the properties of metal, process automation, the basics of cost estimating and a hands-on approach to managing a project to provide the technical experience necessary in today's manufacturing industries. This course also covers practical applications of instruments that are frequently used in current manufacturing industries such as programmable logic controllers (PLCs), pressure gauges, transducers, strain gauges, electronic recorders, and controllers. They gain an understanding of basic electronic theory with an emphasis on the operational aspect of these tools. Class projects help students develop an analytical ability necessary for using manufacturing instrumentation. In addition, students develop an understanding of basic financial management and the interrelationship of with shop floor operations.

Briefly summarize the objectives of this course and attach supporting materials:

The course prepares students as entry and mid-level Computer Numerically Controlled (CNC) machine operators for employment in advanced manufacturing companies using CNC equipment. The course includes training in basic foundation skills to prepare individuals for eventual employment in the precision manufacturing sector. The curriculum is designed to facilitate career pathways for non-traditional workers entering this sector, as well as prepare them for a continuum of future technical education, training and ongoing career opportunities.

Upon successful completion of this course, students should be able to:

1. Define basic Manufacturing Process and Manufacturing Instrumentation terminology, principles, theories and concepts
2. Describe, compare, analyze, and explain the role of all components of Manufacturing Management and Manufacturing Instrumentation in the daily operation of a Manufacturing facility, human influences on the process and on instrumentation systems, and how to best approach cost-effectiveness and Quality issues.
3. Analyze, explain, and present to others the relevance of the various manufacturing processes and instrumentation by applying basic economic terminology, principles, and concepts into an economic profile.
4. Demonstrate and utilize critical thinking skills to analyze current Manufacturing processes and Manufacturing Instrumentation systems components and applications.
5. Recognize and predict changes in the properties of metal when exposed to machine tool techniques.
6. Select the correct feeds and speeds for commonly used materials.
7. Calculate cutting speeds and feeds for a variety of machining processes.

8. Interpret drawings dimensioned according to industry standards and successfully produce the part described by the drawing.
9. Read and interpret qualitative and quantitative data, tables, charts, and analysis.
10. Integrate basic math skills to understand the calculations of key Manufacturing data.
11. Understand fixed costs, variable costs, location specific costs, and how they affect Manufacturing Processes, Instrumentation systems and their applications.
12. Identify realistic career objectives in manufacturing.

□ Summarize the academic proficiencies, outcome and/or competencies of the course and attach supporting materials:
Horizontal and Vertical Milling Machines – Operate the control (manual and auto), set up fixture and tool offset, polar coordinates, set tool preset, understand and apply industry-standard G and M codes to write point-to-point program, canned cycles, perform MDI operations, make program edits, test run program, monitor and adjust tool wear offset
CNC Lathe – Homing the lathe, touching off the stock (Z), touching off the stock (X), verifying the workspace origin, inventory and shut down, program verification, verification view settings, turning the part
□ Describe instructional methods, i.e. how the content of the material is presented, learning activities, etc.:

This course of study is augmented by hands on experience utilizing facilities at the Worcester Technical High School and Worcester Polytechnic Institutes HAAS training lab, and is designed to simulate actual workplace conditions. The student is required and encouraged to work and think independently under the guidance of experienced instructors as they build their skills. The students follow a HAAS Training Tutorial with the student taking on the initiative to complete specific tasks and learn by doing.
Instructor-led lecture and discussion
small group discussion

□ Describe the amount of classroom time the student spends gaining course competencies, i.e. lecture hours/week, field trips, homework, observations, etc.:

Lecture and In Class Activity:
100 hours classroom time
Out of Class Activity:
58 hours homework are assigned consisting of 37 hours of reading and 21 hours of exercises related to the reading
122 hours OJT

□ Describe assessment methods:
Tests; demonstration of skill acquisition; design challenges. The Capstone Project of the training process is to program, machine and assemble a working Stirling Engine. A take home final exam is also given and followed by the students making the part that the final exam centers on.

30%	Capstone Project	25%	In Class Final
10%	Design Challenges	25%	Take Home Final
25%	Milling Test	20%	Quizzes
25%	Lathe Test	20%	Homework
10%	Attendance	10%	Attendance and Participation

Describe Course Materials Used (include text, publisher, edition):

HAAS Automation Programming Workbook for VF/HS Series CNC Machine, June 2006, Haas Automation, Inc., 2800 Sturgis Road, Oxnard, CA 93030
 HAAS Automation Programming Workbook for SL Series CNC Machine, June 2005, Haas Automation, Inc., 2800 Sturgis Road, Oxnard, CA 93030
 MassMEP Workshop: Finance for the Shop Floor

References:
 Machinery's Handbook Toolbox 28th Edition, ISBN 978-0831128005
 Metalworking Sink or Swim: Tips and Tricks for Machinists, Metal Workers and Fabricators, ISBN 9780831133627, Industrial Press, Inc., Publication date: 1/14/2009

Instructor's Name: Matt Healy
 Phone: 508-831-7020
 Toby Bergstrom
 508-208-3024
 Christopher Brown
 508-831-5627

Instructor's Credentials or Expertise (attach resume):

Completed by: _____ Date: _____

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