

REQUEST FOR COURSE-EQUIVALENCY CREDIT

PART I (by Lee Duerden)

QCC Course Prefix and Number: MNT 210
 QCC Course Title: CNC PROGRAMMING

Summarize the goal of the course and attach current course description from college catalog:

Course Goal:

The content of this course identifies the basics of the CNC programming language, it introduces the student to a Haas mini mill and its interface control unit, and demonstrates how to set up tooling and work offsets for machining a part. It is amplified by instruction on measurement of component part to reinforce there knowledge of geometric tolerance and blueprint reading.

Course Description:

This course introduces the essential concepts of computer numerical control (CNC) and its impact on manufacturing and productivity. The course focuses on manual programming of different types of CNC systems, with a strong emphasis on the understanding of G and M codes used in current applications. Students learn to write a variety of part programs for both milling and turning operations.

Summarize instructional objectives and list student learning outcomes expressed in measurable terms (see attached sample):

1. INSTRUCTIONAL OBJECTIVE:

Understand and respect safety procedures associated with machines

MEASURABLE STUDENT OUTCOME(S):

- a) Identify safety issues around cnc machinery.
- b) Identify safety procedures associated with tooling set up.
- c) Secure the work area.
- d) Use safe materials handling practices.

2. INSTRUCTIONAL OBJECTIVE:

Apply geometric knowledge and blue print reading skills learned previously into programming problems

MEASURABLE STUDENT OUTCOME(S):

- a) Identify and select component origins for programming.
- b) Interpret engineering drawings to program the machine.
- c) Interpret geometric constraints with the program.

3. INSTRUCTIONAL OBJECTIVE:

Gain proficiency in the application and selection of safe and effective programming methodology

- MEASURABLE STUDENT OUTCOME(S):
- a) Identify a safe sequence of operations to generate a program.
 - b) Select appropriate tooling
 - c) Use effective safety blocks to maintain safety in the program.

INSTRUCTIONAL OBJECTIVE:

Master the control interface of Haas Mini Mill

MEASURABLE STUDENT OUTCOME(S):

- a) Hand jog the table.
- b) Use the tool setter.
- c) Use the probe.
- d) Use an edge finder.
- e) Identify the various areas on the control panel.
- f) Understand MDI mode.
- g) Load a program from USB drive.
- h) Edit programs.
- i) Safely verify programs through graphing and single block use.

INSTRUCTIONAL OBJECTIVE:

Demonstrate machine set-up and operation

MEASURABLE STUDENT OUTCOME(S):

- a) Turn on and off the Haas machine in a safe manner.
- b) Load and trim a vice onto the table.
- c) Load and eject tool holders.
- d) Load and eject tools from the tool holders.
- e) Perform tool length offset measurement.

INSTRUCTIONAL OBJECTIVE:

Analyze, explain and repair coding errors

MEASURABLE STUDENT OUTCOME(S):

- a) Identify areas of a program that will cause running problems.
- b) Recognize errors before they happen.
- c) Understand and reference G and M codes as they apply to the finished product.

INSTRUCTIONAL OBJECTIVE:

Understand and describe how to program with a variety of codes

MEASURABLE STUDENT OUTCOME(S):

- a) Select appropriate G codes.
- b) Understand a variety of canned cycles.
- c) Demonstrate proficiency in absolute and incremental positioning.
- d) Use linear, circular interpolations.
- e) Use cutter compensations.
- f) Use the IJK method and the XYR method.

- a) Use simple math to identify program cycle time.
- b) Calculate cost of production.
- c) Recognize alternative methods of production to improve cost of parts.

MEASURABLE STUDENT OUTCOME(S):

Quote / estimate for a basic machined components as it applies to company profitability

INSTRUCTIONAL OBJECTIVE:

- a) Use and manipulate the algebraic expressions relative to speeds and feeds.
- b) Identify chip loads from different materials.
- c) Recognize tooling material selections.
- d) Identify raw stock material as a variable in speed and feed calculations.

MEASURABLE STUDENT OUTCOME(S):

Demonstrate learning of machine tool feeds and speeds

INSTRUCTIONAL OBJECTIVE:

- a) Master the coordinate system in absolute
- b) Master the coordinate system in incremental.
- c) Use trigonometry to calculate break-through of drills.
- d) Convert measurement from English to Metric and vice versa.

MEASURABLE STUDENT OUTCOME(S):

Apply basic and advanced math skills in the development of a cnc program

INSTRUCTIONAL OBJECTIVE:

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