Washtenaw Community College Comprehensive Report

NCT 121 Manual Programming and NC Tool Operation
Effective Term: Fall 2014

Course Cover

Division: Advanced Technologies and Public Service Careers
Department: Industrial Technology
Discipline: Numerical Control
Course Number: 121
Org Number: 14450
Full Course Title: Manual Programming and NC Tool Operation
Transcript Title: Manual Programming NC Tool
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Course Change
Change Information:
    Consultation with all departments affected by this course is required.
Rationale: Conditionally approved - seeking full approval.
Proposed Start Semester: Winter 2014
Course Description: This is the first in a two-course study of manual programming of CNC milling and turning centers. Students experience the entire process of part manufacturing by processing working drawings of sample parts, writing and editing of programs, set up and operation of CNC machine tools, and inspection of the finished products. Feeds and speeds, fixed cycles, program editing, set up procedures, and tape preparation are major topics presented. Laboratory time is required outside of class time. Students with experience equivalent to NCT 101 and NCT 110 may contact the instructor for permission to waive the prerequisites.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 30 **Student:** 30
Lab: Instructor: 60 **Student:** 60
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 90 **Student:** 90
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 4

Requisites

Prerequisite
MTT 102 minimum grade "C"
and

Prerequisite
NCT 101 minimum grade "C"; may enroll concurrently
and
Prerequisite
NCT 110 minimum grade "C"; may enroll concurrently

General Education
General Education Area 7 - Computer and Information Literacy
Assoc in Arts - Comp Lit
Assoc in Applied Sci - Comp Lit
Assoc in Science - Comp Lit

Request Course Transfer
Proposed For:

Student Learning Outcomes

1. Construct programs using G&M machine tool language in proper module format.
   Assessment 1
   Assessment Tool: Capstone Projects
   Assessment Date: Fall 2015
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: The capstone project will be scored using the departmentally-developed rubric.
   Standard of success to be used for this assessment: 75% of the students will score a minimum of 70% or higher on the capstone project.
   Who will score and analyze the data: Department Faculty

2. Apply the appropriate process for machining a product from start to finish.
   Assessment 1
   Assessment Tool: Capstone Projects
   Assessment Date: Fall 2015
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: The capstone project will be scored using the departmentally-developed rubric.
   Standard of success to be used for this assessment: 75% of the students will score a minimum of 70% or higher on the capstone project.
   Who will score and analyze the data: Department Faculty

3. Troubleshoot and debug programs at the CNC machine tool controllers yielding parts to specification.
   Assessment 1
   Assessment Tool: Capstone Projects
   Assessment Date: Fall 2015
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: The capstone project will be scored using the departmentally-developed rubric.
   Standard of success to be used for this assessment: 75% of the students will score a minimum of 70% or higher on the capstone project.
   Who will score and analyze the data: Department Faculty

Assessment 2
    Assessment Tool: Department Exam
    Assessment Date: Fall 2015
    Assessment Cycle: Every Three Years
    Course section(s)/other population: All
    Number students to be assessed: All
    How the assessment will be scored: The department exam will be scored using an answer sheet.
    Standard of success to be used for this assessment: 75% of the students will score a minimum of 70% or higher on the exam.
    Who will score and analyze the data: Department Faculty

Course Objectives

1. Apply appropriate G & M codes to produce holes of various types and depth into different materials, using varying peck and dwell cycle and return plane conditions at the mill or lathe.
   Matched Outcomes
   1. Construct programs using G&M machine tool language in proper module format.
2. Apply appropriate G & M codes to produce patterns of holes at the mill.
   Matched Outcomes
   1. Construct programs using G&M machine tool language in proper module format.
3. Apply appropriate G & M codes to produce slots of varying depth into parts at the mill.
   Matched Outcomes
   1. Construct programs using G&M machine tool language in proper module format.
4. Apply appropriate G & M codes to produce linear and circular profile paths using cutter diameter compensation to control feature size into parts at the mills and lathes.
   Matched Outcomes
   1. Construct programs using G&M machine tool language in proper module format.
5. Apply appropriate G & M codes to produce circular pockets at the mills.
   Matched Outcomes
   1. Construct programs using G&M machine tool language in proper module format.
6. Apply appropriate G & M codes to produce irregular pockets, with and without islands, at the mills.
   Matched Outcomes
   1. Construct programs using G&M machine tool language in proper module format.
7. Apply appropriate G & M codes to face materials of part at the lathe.
   Matched Outcomes
   1. Construct programs using G&M machine tool language in proper module format.
8. Apply appropriate G & M codes to produce outside and inside contours on cylindrical parts at the lathes using roughing and finishing cycles.
   Matched Outcomes
   1. Construct programs using G&M machine tool language in proper module format.
9. Locate tool center positions about the part using geometry, algebra and trigonometry.
   Matched Outcomes
   1. Construct programs using G&M machine tool language in proper module format.
10. Create documentation to correspond to written programs for use by set-up operators.
    Matched Outcomes
    1. Construct programs using G&M machine tool language in proper module format.

New Resources for Course
Course Textbooks/Resources
    Textbooks
    Manuals
    Periodicals
    Software
Equipment/Facilities
    Level III classroom

Reviewer	Action	Date
Faculty Preparer:		
Thomas Penird	*Faculty Preparer*	*Dec 19, 2013*
Department Chair/Area Director:		
Thomas Penird	*Recommend Approval*	*Dec 19, 2013*
Dean:		
Marilyn Donham	*Recommend Approval*	*Jan 10, 2014*
Vice President for Instruction:		
Bill Abernethy	*Approve*	*Feb 10, 2014*