

**Course Assessment Report
Washtenaw Community College**

Discipline	Course Number	Title
Numerical Control	110	NCT 110 07/22/2019- Introduction to Computerized Machining (CNC) - II
Division	Department	Faculty Preparer
Advanced Technologies and Public Service Careers	Advanced Manufacturing	Thomas Penird
Date of Last Filed Assessment Report		

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

No

2. Briefly describe the results of previous assessment report(s).

3.

4. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

5.

II. Assessment Results per Student Learning Outcome

Outcome 1: Setup and operate Vertical Machining Centers and Turning Centers.

- Assessment Plan
 - Assessment Tool: Outcome-related projects
 - Assessment Date: Fall 2021
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Students' projects will be evaluated using a rubric.

- Standard of success to be used for this assessment: 75% of the student projects will score 75% or better.
- Who will score and analyze the data: Department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2018	2017, 2016	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
44	50

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Eight students withdrew.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Evening students

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Students were assessed with rubric that looked at setup, pre-data sheet information, journal notes, post-data sheet, completed part and wrap up notes for items out of specification.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
 The average score for all capstone projects (magnifier bezel and legs, clock lathe blank and milled features, snowman lathe blanks and threaded plug with milled features at ends) for the students completing the class was 90.2 percent.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Strengths were seen in setup and operation of all CNC machines in the shop.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We have recently added a new lathe to the lab. This brings the lathe count to four while we have seven mills. The added exposure to lathes will improve student comfort and skill level to this equipment.

Outcome 2: Set machine parameters for machine tool operations at multiple work locations.

- Assessment Plan
 - Assessment Tool: Outcome-related projects
 - Assessment Date: Fall 2021
 - Course section(s)/other population: All
 - Number students to be assessed: All
 - How the assessment will be scored: Students' projects will be evaluated using a rubric.
 - Standard of success to be used for this assessment: 75% of the student projects will score 75% or better.
 - Who will score and analyze the data: Department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2018	2017, 2016	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
44	50

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Eight students withdrew.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Evening students

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Capstone projects at the lathe and mills were used. A grading rubric was used to assess the students' work.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

The average score for all capstone projects for the class was 90.2 percent.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students are able to set work coordinates X-Y for the two work locations. Understanding the interaction of the Z-axis to the work environment and how its value manipulates tool length offset is the challenge. By the end of the semester, students use verify-tools learned to overcome these challenges. These are necessary critical thinking skills for later experiences in industry.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Improvement comes with time on task. Students specializing in the CNC machine tool track get many more hours of exposure to the controllers/setup.

We have started to open labs on Saturdays for students wishing to practice their skill sets.

Outcome 3: Analyze part measurements and derive necessary changes at the machine tool registers to produce parts within specified tolerances.

- Assessment Plan
 - Assessment Tool: Department exams

- Assessment Date: Fall 2021
- Course section(s)/other population: All
- Number students to be assessed: All
- How the assessment will be scored: Answer key
- Standard of success to be used for this assessment: 75% or more of the questions selected will be correct 75% or greater of the time.
- Who will score and analyze the data: Department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2018	2017, 2016	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
44	50

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Eight students withdrew.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Evening students (this class runs evening only).

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam with part to machine process questions was used to assess this outcome.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Students on the written portion of the exam scored 75.4 percent on average.
 This meets the standard of success.

- Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students are able to make parts within specification by the end of the semester. They are also able to describe how this is achieved on a written test away from the machines.

- Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Improvement comes with time on task. Students specializing in the CNC machine tool track get many more hours of exposure to the controllers/setup.
 We have started to open labs on Saturdays for students wishing to practice their skill sets.

III. Course Summary and Intended Changes Based on Assessment Results

- Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

N/A - this is the first assessment.

- Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

No surprises; the addition of the new CNC machines gives students more hands-on time.

- Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

Data will be shared with full/part-time faculty.

- Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
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Course Assignments	In the NCT 121 class I will be providing programs that need debugging to improve their visualization skills	The challenge for students comes at the machine controller when their X-Y data draws a line that is not what they intended. Visually interpreting the X-Y data on the controller and making updates spatially is a challenge. This assignment teaches students to look at X-Y data at the controller and visualize where the tool will move. This is needed for debugging at the controller. Students continuing on into manual programming will step through programs line by line on the simulators to find errors in their code.	2020
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Added Saturday open lab times for student to improve their proficiency in alignment and edge detection.	Students have more difficulty with the "old school" methods and approximately 25% of them need additional practice.	2020
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Adding a new lathe to the lab so students can have more access.	We anticipate this will improve student performance on lathe setup tasks	2020

5. Is there anything that you would like to mention that was not already captured?

6.

III. Attached Files

[NCT 110 DATA](#)

Faculty/Preparer: Thomas Penird **Date:** 07/22/2019
Department Chair: Thomas Penird **Date:** 08/14/2019
Dean: Brandon Tucker **Date:** 09/12/2019
Assessment Committee Chair: Shawn Deron **Date:** 08/25/2020