Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Numerical Control	123	NCT 123 06/30/2024-2D CAD CAM CNC Programming for Mills and Lathes
College	Division	Department
Advanced Technologies and Public Service Careers	Advanced Technologies and Public Service Careers	Advanced Manufacturing
Faculty Preparer		Andrew Dubuc
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: Create 2D tool paths for milling operations.

- Assessment Plan
  - Assessment Tool: Outcome-related capstone projects
  - Assessment Date: Fall 2022
  - Course section(s)/other population: All
  - Number students to be assessed: All
  - How the assessment will be scored: Departmentally-developed rubric

- Standard of success to be used for this assessment: 75% of the students will score 75% or greater.
- Who will score and analyze the data: Departmental 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)
		2023, 2022, 2021, 2020

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

# of students enrolled	# of students assessed
32	30

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.

Two students did not complete the course and ended up failing.

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.

All completing students were included in the data.

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

This learning outcome is assessed using a "capstone" project which takes place after the 2D units are complete. The project is a student-created workpiece that must be designed, programmed, and machined by each student independently. The requirements for the workpiece involve multiple aspects from the previous learning units such as drilled holes, cutting slots, performing precise cutting, etc. In Spring 2022, a more detailed rubric was created to better organize the grading process.

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

For outcome 1, 83% (25/30) students scored 75% or higher. The standard of success was met.

Spring 2020: 92% average
Spring 2021: 98% average
Spring 2022: 86% average
Spring 2023: 86% average (one student earned a zero)

Average of all students is 90%

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

The result (83%) shows that most students were able to measure the majority of the items correctly. Most students scored perfect for this project, with a few outliers that ended up with lower scores.

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.

The grading criteria for all capstone projects in this class could be expanded to provide better detail. The grading was already updated in 2022 but additional refinement will be useful.

Outcome 2: Create 2D tool paths for lathe operations.

- Assessment Plan
    - Assessment Tool: Outcome-related capstone projects
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All
    - Number students to be assessed: All
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 75% of the students will score 75% or greater.
    - Who will score and analyze the data: Departmental 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)

		2023, 2022, 2021, 2020

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

# of students enrolled	# of students assessed
32	30

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.

Two students did not complete the course and ended up failing.

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.

All completing students are included.

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

This learning outcome is assessed using a "capstone" project which takes place after the 2D units are complete. The project is a student-created workpiece that must be designed, programmed, and machined by each student independently. The workpiece must include common features of a round workpiece that could be produced on this type of machine tool.

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
For outcome 2, 90% (27/30) students scored 75% or higher. The standard of success was met. Spring 2020: 93% average Spring 2021: 91% average Spring 2022: 100% average Spring 2023: 86% average(one student earned a zero) Average of all students is 92%

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

The result (90%) shows that most students were able to measure the majority of the items correctly. Most students scored perfect for this project, with a few outliers that ended up with lower scores.

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.

The grading criteria for all capstone projects in this class could be expanded to provide better detail. In particular, this outcome is a shorter project compared to the other outcomes, so it may warrant restructuring to balance the competencies of the class.

Outcome 3: Write and modify post files to run the CNC machine tools.

- Assessment Plan
    - Assessment Tool: Outcome-related capstone projects
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All
    - Number students to be assessed: All
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 75% of the students will score 75% or greater.
    - Who will score and analyze the data: Departmental 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)
		2023, 2022, 2021, 2020

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

# of students enrolled	# of students assessed
32	30

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.

Two students did not complete the course and ended up failing.

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.

All completing students are included.

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

This learning outcome is assessed using a "capstone" project which takes place after the 2D units are complete. The project is a student-created workpiece that must be designed, programmed, and machined by each student independently. The requirements for the workpiece involve multiple aspects from the previous learning units such as drilled holes, cutting slots, performing precise cutting, etc. In Spring 2022, a more detailed rubric was created to better organize the grading process.

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
For outcome 3, 83% (25/30) students scored 75% or higher. The standard of success was met. Spring 2020: 89% average Spring 2021: 83% average Spring 2022: 86% average Spring 2023: 86% average (one student earned a zero) Average of all students is 86%

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

The result (83%) shows that most students were able to measure the majority of the items correctly. Most students scored perfect for this project, with a few outliers that ended up with lower scores.

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.

The grading criteria for all capstone projects in this class could be expanded to provide better detail. The grading was already updated in 2022 but additional refinement will be useful.

III. Course Summary and Intended Changes Based on Assessment Results

1. 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.

This course has never been assessed. The grading was restructured in 2022 to better reflect the process for completing each capstone project. This provided better detail in the grading score for the capstone projects, but additional refinements will be made (see action plan).

2. 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?

The course assessment for the last four years was adequate but this course needs major restructuring to better represent updates that have taken place over the past few years. Again, see the action plan for details.

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

I have been discussing possible action plans over the last few months with other department faculty. We'll formalize the plans within this semester.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Outcome Language	I would like to add a new Learning Outcome (and supporting objectives) that clarify the difference between 2D and 3D workpieces within this software.	At present, the outcomes only describe 2D operations even though the class also includes 3D milling operations.	2025
Objectives	I need new Objectives to	Several new Objectives will be	2025

	describe the week-by-week progression through the 3D learning units. The objectives will contain verbiage for roughing, finishing, engraving, and fine detail clean-up operations for those types of programming.	required to support a new Learning Outcome for 3D workpieces.	

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

6.

III. Attached Files

Capstone scores

Faculty/Preparer:	Andrew Dubuc	**Date:**	06/30/2024
Department Chair:	Allan Coleman	**Date:**	07/03/2024
Dean:	Eva Samulski	**Date:**	07/12/2024
Assessment Committee Chair:	Jessica Hale	**Date:**	06/09/2025