NCT 101: INTRODUCTION TO COMPUTERIZED MACHINING (CNC) - I

History

1. Dec 4, 2025 by Sera Bird (sabird)

Viewing: NCT 101 : Introduction to Computerized Machining (CNC) - I
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Effective Term
Winter 2026

Rationale and proposal summary
We have created a new course that is sequenced to take place before this (NCT-100). Many of the skills in the new course were drawn out of existing outcomes of NCT-101 so new outcomes are now needed to better suit the current class structure.

Course Cover

Full Course Title
Introduction to Computerized Machining (CNC) - I

Transcript Title
Intro Comp Machining(CNC) - I

Subject Code
NCT - Numerical Control
Course Number
101

Department
Advanced Manufacturing (AMTD)

Banner Division
ATP

Division/College
Adv Tech/Public Serv Careers (AT)

Org Code
14400

Course Description
In this course, students will explore various aspects of automated machining centers used in manufacturing. Prior skills in the setup and operation of computer numerical control (CNC) equipment will be expanded. Studies include fundamentals of setup and operation, basic programming including G-code, applications of mill and lathe cutting tools, and manufacturing complex workpieces to proper specification. This is a continuation of the numerical control series with an emphasis on computerized manufacturing equipment.

Planned Delivery Format
Face to Face

Has this course been approved for online or online blended?
No

Grading method
Standard Letter, Audit

CIP Code
159999 - Engineering/Engineering-Related Technologies/Technicians, Other.

Occupational Indicator

Yes

ACS Code

130

Credit hours, contact hours, repeatability

Repeatable for additional credit

No

Course credits

2

Lecture contact hours

30

Lab contact hours

30

Total Contact Hours

60

Expected Total Contact Hours

60

Prerequisites and prerequisite skill levels

College-Level Math

No Level Required

College-Level Reading and Writing

College-level Reading and Writing

Approved Level I Prerequisite:

Academic Reading and Writing Levels of 6; NCT 100 minimum grade "C"

Is concurrent enrollment an option for this prerequisite?

No

Course Assessment Plan
Learning Outcome

Outcome

Identify the proper type of cutting tools necessary to manufacture parts.

Assessment #1

Assessment Tool

Outcome-related test questions

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Fall

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored
Answer key

Who does the scoring?
Departmental faculty

Standard of success
70% of students will score 70% or higher.

Assessment #2

Learning Outcome

Outcome
Create CNC programs to cut basic workpieces.

Assessment #1

Assessment Tool
Outcome-related skills checklist

Anticipated Next Assessment Year
2025

Anticipated Next Assessment Term
Fall

Assessment Cycle
Every Three Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Departmentally-developed rubric

Who does the scoring?
Departmental faculty

Standard of success
70% of students will score 70% or higher.

Assessment #2

Learning Outcome

Outcome
Demonstrate setup and operation procedures needed to manufacture parts.

Assessment #1

Assessment Tool
Outcome-related project

Anticipated Next Assessment Year
2025

Anticipated Next Assessment Term
Fall

Assessment Cycle
Every Three Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Departmentally-developed rubric

Who does the scoring?
Departmental faculty

Standard of success
70% of the students will be successful at completing 75% or greater of all machined parts assigned.

Assessment #2

Course Objectives

	Objective(s)
1.	Identify lathe tool geometry and applications.
2.	Identify milling tool geometry and applications.
3.	Determine the sequential process required to cut a finished workpiece.
4.	Utilize the machine's canned cycles to build program modules.
5.	Determine optimal cutting speed and feed rate for various types of tools and fabrication processes.
6.	Apply steps for debugging and editing a program at the computer numerical controller.
7.	Recognize layers of the NC controllers.
8.	Identify key miscellaneous codes required to activate various machine tool conditions within program modules.
9.	Recognize key concepts, including fixture alignment, work offset, tool length offset (TLO), cutter diameter compensation, preparatory codes.

General Education Area(s)

Area 1: Writing
No

Area 2: 2nd Writing or Communication/Speech
No

Area 3: Mathematics
No

Area 4: Natural Science
No

Area 5: Social and Behavioral Science
No

Area 6: Arts and Humanities
No

MTA General Education
No

Review

Is conditional approval requested?
No

Is this course currently conditionally approved, and you are now submitting it for full approval?
No

Key: 7663

Washtenaw Community College Comprehensive Report

NCT 101 Introduction to Computerized Machining (CNC) - I
Effective Term: Fall 2022

Course Cover
College: Advanced Technologies and Public Service Careers
Division: Advanced Technologies and Public Service Careers
Department: Advanced Manufacturing
Discipline: Numerical Control
Course Number: 101
Org Number: 14400
Full Course Title: Introduction to Computerized Machining (CNC) - I
Transcript Title: Intro Comp Machining(CNC) - I
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:
   Pre-requisite, co-requisite, or enrollment restrictions
Rationale: New introductory course NCT 100 is added to our program. Adding prereq only at this time.
Proposed Start Semester: Fall 2022
Course Description: This is the first course of the numerical control series. Students explore various aspects of automated machining centers used in automated manufacturing. Studies include an introduction to controllers, fundamentals of setup and operation, programming computer numerical control (CNC) controllers, computer-aided design/computer-aided manufacturing (CAD/CAM) software, and simulation software.

Course Credit Hours
Variable hours: No
Credits: 2
Lecture Hours: Instructor: 30 **Student:** 30
Lab: Instructor: 30 **Student:** 30
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 60 **Student:** 60
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

Requisites
Prerequisite
NCT 100 minimum grade "C"

General Education

Request Course Transfer
Proposed For:
Eastern Michigan University
Wayne State University

Student Learning Outcomes

1. Recognize and apply nomenclature to CNC controllers.
   Assessment 1
   Assessment Tool: Outcome-related departmental quizzes
   Assessment Date: Fall 2022
   Assessment Cycle: Every Three Years
   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% of students taking the departmental quizzes will score 75% or greater for nomenclature at the controllers.
   Who will score and analyze the data: Departmental faculty

2. Identify the layers of the machine tool controllers.
   Assessment 1
   Assessment Tool: Outcome-related quizzes
   Assessment Date: Fall 2022
   Assessment Cycle: Every Three Years
   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% of the students will score 75% or greater on all questions selected.
   Who will score and analyze the data: Departmental faculty

3. Demonstrate setup and operation procedures needed to manufacture parts.
   Assessment 1
   Assessment Tool: Outcome-related project
   Assessment Date: Fall 2022
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Student projects (parts) will be determined complete or incomplete.
   Standard of success to be used for this assessment: 75% of the students will be successful at completing 75% or greater of all machined parts assigned.
   Who will score and analyze the data: Departmental faculty

Course Objectives
1. Differentiate between CNC and numerical control (NC).
2. Recognize history related to NC and CNC.
3. Recognize terminology and abbreviations associated with CNC industry. The following is a list of some of the terms students will become familiar with: CNC/direct numerical control (DNC), digital read-out (DRO), interpolation, CDC/tool length offset (TLO)/gauge lengths, work offsets, tool pallets, post processors.
4. Recognize layers of the NC controllers.
5. Calculate speeds and feeds.

6. Identify key miscellaneous codes required to activate various machine tool conditions within program modules.
7. Construct simple programs and run the parts at the CNC machine tools.
8. Recognize key concepts, including fixture alignment, work offset, TLO, cutter diameter compensation, preparatory codes.
9. Apply steps for debugging and editing a program at the computer numerical controller.

New Resources for Course

Course Textbooks/Resources
Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Reviewer	Action	Date
Faculty Preparer:		
Allan Coleman	*Faculty Preparer*	*Jan 17, 2022*
Department Chair/Area Director:		
Allan Coleman	*Recommend Approval*	*Jan 17, 2022*
Dean:		
Jimmie Baber	*Recommend Approval*	*Jan 18, 2022*
Curriculum Committee Chair:		
Randy Van Wagnen	*Recommend Approval*	*Feb 16, 2022*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Feb 23, 2022*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Feb 23, 2022*

Washtenaw Community College Comprehensive Report

NCT 101 Introduction to Computerized Machining (CNC) - I
Effective Term: Fall 2011

Course Cover

Division: Advanced Technologies and Public Service Careers
Department: Advanced Manufacturing
Discipline: Numerical Control
Course Number: 101
Org Number: 14400
Full Course Title: Introduction to Computerized Machining (CNC) - I
Transcript Title: Intro Comp Machining(CNC) - I
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: New Course
Change Information:
    Consultation with all departments affected by this course is required.
Rationale: Conditionally approved course seeking full approval
Proposed Start Semester: Spring/Summer 2011
Course Description: This is the first course of the numerical control series. Students are exposed to various aspects of automated machining centers used in automated manufacturing. Studies include an introduction to controllers, fundamentals of set-up and operation, programming CNC controllers, CAD CAM software and simulation software. This course contains material previously taught in NCT 112.

Course Credit Hours

Variable hours: No
Credits: 2
Lecture Hours: Instructor: 30 **Student:** 30
Lab: Instructor: 30 **Student:** 30
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 60 **Student:** 60
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

Requisites

General Education

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Students will improve ability to recognize and apply nomenclature to CNC controllers.
    ### Assessment 1
    Assessment Tool: Pre Test - Post Test This tool is utilized to identify those students returning for retraining and identify improvement.
    Assessment Date: Fall 2011
    Assessment Cycle: Every Three Years
    Course section(s)/other population: All
    Number students to be assessed: All
    How the assessment will be scored: Immersive software scores and shows Pre-test, post-test results
    Standard of success to be used for this assessment: There will be a minimum increase of 30% in score on average from the combined pre-test to the combined post-test results, for all students.
    Who will score and analyze the data: Departmental Faculty

2. Identify the layers of the machine tool controllers.
    ### Assessment 1
    Assessment Tool: Quizzes
    Assessment Date: Fall 2011
    Assessment Cycle: Every Three Years
    Course section(s)/other population: All
    Number students to be assessed: All
    How the assessment will be scored: Quizzes are scored using an answer key
    Standard of success to be used for this assessment: 75% of the students will score 75% or greater on all questions selected.
    Who will score and analyze the data: Department Faculty

3. Recognize setup and operation procedures needed to manufacture parts.
    ### Assessment 1
    Assessment Tool: Project
    Assessment Date: Fall 2011
    Assessment Cycle: Every Three Years
    Course section(s)/other population: All
    Number students to be assessed: All
    How the assessment will be scored: Students projects (parts) will be determined complete or incomplete.
    Standard of success to be used for this assessment: 75% of the students will be successful at completing all parts.
    Who will score and analyze the data: Department Faculty

4. Apply the key processes in creating geometry CAD CAM system.
    ### Assessment 1
    Assessment Tool: Project
    Assessment Date: Fall 2011
    Assessment Cycle: Every Three Years
    Course section(s)/other population: All
    Number students to be assessed: All
    How the assessment will be scored: Students will use the software to develop geometry for a capstone project at the CNC machine tool. The project will be evaluated using a rubric.
    Standard of success to be used for this assessment: The overall average score of the student project will be 75% (3of 4 or better)
    Who will score and analyze the data: Department Faculty

Course Objectives

1. Differentiate between CNC and NC.
2. Recognize history related to NC and CNC.
3. Recognize terminology and abbreviations associated with CNC industry. The following is a list of some of the terms students will become familiar with: CNC/DNC, DRO, Interpolation, CDC/TLO/Gage Lengths, Work Offsets, Tool Pallets, Post processors.
4. Recognize layers of the NC controllers.
5. Calculate speeds and feeds.
6. Identify key miscellaneous codes, required to activate various machine tool conditions within program modules.
7. Construct simple programs and run the parts at the CNC machine tools.
8. Recognize the key concepts, including: Fixture alignment, Work Offset, Tool Length Offsets, Cutter Diameter Compensation, preparatory codes.
9. Recognize key concepts to CAD/CAM systems, including: Layer and view control, geometry creation, edit, trim, break, copy and move geometry.

New Resources for Course

Course Textbooks/Resources
Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Reviewer	Action	Date
Faculty Preparer:		
Thomas Penird	*Faculty Preparer*	*Nov 19, 2010*
Department Chair/Area Director:		
Thomas Penird	*Recommend Approval*	*Nov 20, 2010*
Dean:		
Granville Lee	*Recommend Approval*	*Nov 23, 2010*
Curriculum Committee Chair:		
Kelley Gottschang	*Recommend Approval*	*Mar 14, 2011*
Assessment Committee Chair:		
Rosemary Rader	*Recommend Approval*	*Mar 14, 2011*
Vice President for Instruction:		
Stuart Blacklaw	*Approve*	*Mar 15, 2011*