NCT 120: INTRODUCTION TO COMPUTER AIDED DESIGN (CAD) FOR MANUFACTURING

Completed Workflow

1. AMTD Chair (acoleman10@wccnet.edu)
2. AT Dean (krue@wccnet.edu,esamulski@wccnet.edu)
3. C&A Assistant (aabooker@wccnet.edu)
4. Curricular Systems Coordinator (cacevans@wccnet.edu)
5. C&A Coordinator (sabird@wccnet.edu)
6. C&A Director (bjlinford@wccnet.edu)
7. Before Comm review (aabooker@wccnet.edu)
8. Comm Review step (sabird@wccnet.edu)
9. After Comm review (sabird@wccnet.edu,bjlinford@wccnet.edu)
10. Curriculum Committee Chair (rvanwagnen@wccnet.edu)
11. Assessment Committee Chair (jhale15@wccnet.edu)
12. Before VPI (sabird@wccnet.edu)
13. Vice President for Instruction (eloubert@wccnet.edu; brtucker@wccnet.edu)
14. Banner (cacevans@wccnet.edu)

Approval Path

1. 2026-01-23T17:53:04Z
   Allan Coleman (acoleman10): Approved for AMTD Chair
2. 2026-01-23T18:08:06Z
   Kyrsten Rue (krue): Approved for AT Dean
3. 2026-03-12T18:14:10Z
   Sera Bird (sabird): Approved for C&A Assistant
4. 2026-03-13T14:38:10Z
   Carol Evans (cacevans): Approved for Curricular Systems Coordinator
5. 2026-03-13T18:56:12Z
   Sera Bird (sabird): Approved for C&A Coordinator
6. 2026-03-20T15:37:43Z
   Ben Linford (bjlinford): Approved for C&A Director
7. 2026-03-20T17:41:43Z
   Amber Booker (aabooker): Approved for Before Comm review
8. 2026-03-26T20:27:00Z
   Amber Booker (aabooker): Approved for Comm Review step
9. 2026-07-09T19:23:56Z
   Ben Linford (bjlinford): Approved for After Comm review
10. 2026-09-21T20:15:55Z
    Sera Bird (sabird): Approved for Curriculum Committee Chair
11. 2026-09-21T20:16:09Z
    Sera Bird (sabird): Approved for Assessment Committee Chair
12. 2026-09-21T20:16:16Z
    Sera Bird (sabird): Approved for Before VPI
13. 2026-09-21T20:24:51Z
    Brandon Tucker (brtucker): Approved for Vice President for Instruction
14. 2026-09-22T13:41:50Z
    Carol Evans (cacevans): Approved for Banner

History

1. Nov 12, 2025 by Carol Evans (cacevans)
2. Sep 22, 2026 by Allan Coleman (acoleman10)

Viewing: NCT 120 : Introduction to Computer Aided Design (CAD) for Manufacturing

Changes proposed by: Allan Coleman (acoleman10)

Effective Term

Winter 2027

Rationale and proposal summary

Creating DL version of course (current cohort) and aligning with needs of industry and next level courses in AMT and WAF departments.

Course Cover

Full Course Title

Introduction to Computer Aided Design (CAD) for Manufacturing

Transcript Title

Intro to Computer Aided Design

Subject Code

NCT - Numerical Control

Course Number

120

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 develop career-ready technical skills with three-dimensional solid modeling software (CAD) used in manufacturing, engineering, and design pathways. Instruction emphasizes industry-standard modeling techniques, the proper application of constraints, and the creation of fully parametric models that demonstrate design intent. Students apply problem-solving, critical thinking, and technical communication skills while creating parts, assemblies, and simple technical drawings (blueprints). Students also prepare and export digital files for secondary manufacturing processes such as 3D printing and plasma cutting, reinforcing connections between digital design and real-world production systems.

Planned Delivery Format

Face to Face
Online
Virtual

Has this course been approved for virtual or blended virtual?

No

Has this course been approved for online or online blended?

Yes

Grading method

Standard Letter, Audit, Academic Forgiveness

CIP Code

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

Occupational Indicator

Yes

ACS Code

130

Degree Attributes

HTEC - High School Articulation

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
Level 2

College-Level Reading and Writing
College-level Reading and Writing

Approved Level I Prerequisite:
Academic Reading and Writing Levels of 6; Academic Math Level of 2

Approved Level II Prerequisite:
MEC 101 and WAF 106, may be taken concurrently

Is concurrent enrollment an option for this prerequisite?
No

Course Assessment Plan
Learning Outcome

Outcome
Create solid models using proper constraints using computer aided design (CAD) software.

Assessment #1

Assessment Tool
Outcome-related project

Anticipated Next Assessment Year
2026

Anticipated Next Assessment Term
Fall

Assessment Cycle
Every Three Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Skills checklist

Who does the scoring?
Departmental faculty

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

Assessment #2

Learning Outcome

Outcome
Export prepared and validated files for secondary manufacturing processes.

Assessment #1

Assessment Tool
Outcome-related project

Anticipated Next Assessment Year
2026

Anticipated Next Assessment Term
Fall

Assessment Cycle
Every Three Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Skills checklist

Who does the scoring?
Departmental faculty

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

Assessment #2

Course Objectives

	Objective(s)
1.	Open, organize, and save model files.
2.	Create two-dimensional (2D) sketches using proper constraints.
3.	Manipulate sketch and solid model geometry (move, trim, extend).
4.	Create three-dimensional (3D) solid model from sketches.
5.	Create feature patterns within sketch and solid model environments.
6.	Demonstrate navigating a model tree (browser).
7.	Demonstrate critical thinking to apply proper constraints and design intent.
8.	Export files prepared for secondary processes or software.
9.	Create simple technical drawings (blueprints)
10.	Create geometry on alternate planes or faces.

11.	Assemble 3D bodies.
12.	Reverse engineer a part to solve a problem.

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

Reviewer Comments
Sera Bird (sabird) (2026-03-12T18:14:08Z): Pulling forward to CSC queue.
Sera Bird (sabird) (2026-09-21T20:15:53Z): Approved by C&A Committee Chairs via internal tracking system 9/17/26.
Sera Bird (sabird) (2026-09-21T20:16:06Z): Approved by C&A Committee Chairs via internal tracking system 9/17/26.

Key: 7667

Washtenaw Community College Comprehensive Report

NCT 120 Introduction to 2D CAD CAM Programming and Applications
Effective Term: Fall 2016

Course Cover

Division: Advanced Technologies and Public Service Careers
Department: Industrial Technology
Discipline: Numerical Control
Course Number: 120
Org Number: 14400
Full Course Title: Introduction to 2D CAD CAM Programming and Applications
Transcript Title: Intro 2D CAD CAM Prog. and App
Is Consultation with other department(s) required: Yes
Please Explain:
Welding and Fabrication will use this course in their revised program.
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: New Course
Change Information:
Rationale: This class will support the equipment found in the NCT, WAF, and MEC programs.
Proposed Start Semester: Fall 2016
Course Description: In this course, students will learn CAD/CAM software to design parts for the various CNC manufacturing equipment. Points, lines, circles, view control, layers colors, break and trim functions will be used to create the geometry. Students will create both 2D and 3D geometry. The part geometry will be used to generate output files for various manufacturing equipment. Fundamental G and M codes will be reviewed to address machine specific requirements. This course contains material previously taught in NCT 249.

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
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

No Level Required

Requisites

General Education

Request Course Transfer

Proposed For:

Eastern Michigan University

Student Learning Outcomes

1. Apply CAD CAM software to create 2D and 3D part geometry.
   Assessment 1
   Assessment Tool: Capstone project art to program
   Assessment Date: Fall 2017
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: Random sample of all students with a maximum of one full section.
   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: Department Faculty

2. Create CAM files for various manufacturing equipment.
   Assessment 1
   Assessment Tool: Capstone project art to program
   Assessment Date: Fall 2017
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: Random sample of all students with a maximum of one full section
   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: Department Faculty

Course Objectives

1. Demonstrate how to open and save files.
2. Demonstrate how to navigate the menu structures.
3. Use view control and layers to organize geometry in the part models.
4. Use the display functions (zoom, pan, rotate, fit, refresh).
5. Manipulate geometry (delete, edit color, move to layers).
6. Create point or points using all options in the “point” and “points” menu structure.
7. Create lines using all options in the menu structure.
8. Create circles using all options in the menu structure.
9. Create and control contour tool path geometry using tool pallet menu structure.
10. Create 2D part geometry for tool paths.
11. Create 3D part geometry.
12. Create specific files needed for various CNC manufacturing equipment.
13. Identify beginning and ending program structures for various equipment

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom
Computer workstations/lab

Reviewer	Action	Date
Faculty Preparer:		
Thomas Penird	*Faculty Preparer*	*Aug 29, 2015*
Department Chair/Area Director:		
Thomas Penird	*Recommend Approval*	*Aug 29, 2015*
Dean:		
Brandon Tucker	*Recommend Approval*	*Oct 06, 2015*
Curriculum Committee Chair:		
Kelley Gottschang	*Recommend Approval*	*Nov 30, 2015*
Assessment Committee Chair:		
Michelle Garey	*Recommend Approval*	*Dec 01, 2015*
Vice President for Instruction:		
Michael Nealon	*Approve*	*Dec 14, 2015*