



**TRINITY VALLEY COMMUNITY COLLEGE  
ADMINISTRATIVE-MASTER SYLLABUS**

The Administrative- Master Syllabus is an administrative tool; it is **not intended to be distributed to students.** It is the intention of this Administrative-Master Syllabus to provide a general description of the course, outline the required elements of the course and to lay the foundation for course assessment for the improvement of student learning, as specified by the faculty of TVCC, regardless of who teaches the course, the timeframe by which it is instructed, or the instructional method by which the course is delivered. It is not intended to restrict the manner by which an individual faculty member teaches the course but to be an administrative tool to aid in the improvement of instruction. The Administrative-Master Syllabus will demonstrate that there is consistency and comparability in course offerings.

**Course Title**

Introduction to Computer Aided Manufacturing

**Course Prefix and Number**

MCHN 1426

**Department – Division**

Drafting – Vocational/Technical

**Course Type** – select from one of the following categories.

- Academic General Education Course (from ACGM – but not in TVCC Core)
- Academic TVCC Core Course
- WECM Courses

**Semester Credit Hours: Lecture Hours: Lab/other hours**

Semester Credit Hours	Lecture Hours	Lab/Other* Hours
4	3	3

Other hours include practicum, clinical or other types of non-lecture instruction. \*If other, please specify: \_\_\_\_\_

## **Course Catalog Description**

A study of Computer-Aided Manufacturing (CAM) systems. Software is used to develop applications for manufacturing. Emphasis on tool geometry, tool selection, and the tool library.

## **Prerequisites/co requisites**

ENGR 1304 Engineering Graphics 1  
DFTG 1309 Basic Computer Aided Drafting  
Or Consent of instructor

## **Topical Outline**

- 1) Introduction to Computer Aided Manufacturing
- 2) History and Evolution of Manufacturing
- 3) Introduction to Computer Numerical Control (CNC)
  - a) Evolution of Numerical Control (NC)
  - b) Microcomputer technology
  - c) NC applications
    - i) Milling
    - ii) Turning
    - iii) Wire EDM
    - iv) Robots and CNC
  - d) CNC controllers
  - e) The CNC process
- 4) CNC Fundamentals and Vocabulary
  - a) Axis and motion nomenclature
  - b) CNC milling fundamentals
  - c) CNC turning fundamentals
- 5) Programming Concepts
  - a) CNC codes
  - b) Program zero
  - c) Tool motion
  - d) Using canned cycles
  - e) Tooling
    - i) Drilling
    - ii) Milling
    - iii) Punching and nibbling
    - iv) Turning
    - v) Federates and spindle speeds
    - vi) Cutting fluids
- 6) CNC Milling
  - a) G-Codes
  - b) M-Codes
- 7) CNC Turning
  - a) G-Codes

- b) M-Codes
- 8) Introduction to Computer Aided Design/Computer Aided Manufacturing (CAD/CAM)
  - a) Computer Aided Design
  - b) AutoCAD
  - c) Computer Aided Manufacturing
  - d) GibbsCAM
- 9) CNC Projects

<b>Course Learning Outcomes</b>
---------------------------------

Upon completion of this course, the student will be able to:

- 1) Demonstrate knowledge of Computer-Aided Manufacturing systems
- 2) Demonstrate an ability to create, download, and machine parts using Computer-Aided Manufacturing software
- 3) Describe the various basic methods of manufacturing.
- 4) Demonstrate an understanding of and manually produce code such as G-CODE for Computer Numerical Control (CNC) milling processes.
- 5) Demonstrate the proper use of equipment.
- 6) Demonstrate an understanding of safety procedures.
- 7) Demonstrate file management techniques.
- 8) Demonstrate the use of control coordinates and scales.
- 9) Demonstrate the use of software to produce drawings for the purpose of automatically generating code for CNC milling processes.

<p><b>Relationship to General Education Outcomes</b> – In addition to the core competencies, Trinity Valley Community College has established ten general education goals which specify knowledge and skills that students should gain from completing courses in the various component areas of the core curriculum. Information regarding curriculum and assessment as a means for the improvement of student learning through the general education component. (Select all that apply.)</p>
--

Mark with an "X"	General Education Outcome
	A. To communicate clearly and effectively in both oral and written English.
	B. To improve reading skills focused on comprehending, analyzing, interpreting, and evaluating printed materials.
X	C. To understand mathematical information and utilize mathematical skills.
X	D. To demonstrate qualitative and quantitative critical thinking skills.
	E. To understand and appreciate cultural and ethnic diversity.

X	F. To utilize computer based technology in accessing information, solving problems, and communicating.
	G. To recognize and evaluate artistic achievements in the visual and performing arts.
	H. To improve basic understanding of political, economic, and social systems.
	I. To demonstrate knowledge of the physical universe and living systems.
	J. To develop skills and strategies to become an engaged learner.

**Required Text(s)**

The CNC Workshop  
 Frank Nanfara, Tony Uccello, Derek Murphy  
*SDC Publications*  
 ISBN: 1-58503-083-X

**Optional Text(s)**

NONE

**Material/Technology to be supplied by the student.**

Optional USB Flash drive for back ups

**Course Requirements/Grading System** – describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course; not intended to restrict the individual nature by which each faculty member who teaches the course determines course requirements and final student performance, but should offer consistency within reason for all sections taught for those departments without a standardized format.

Lab Assignments    90%  
 Final Exam            10%  
                                   100%

***Approvals – the contents of this document have been reviewed and are found to be accurate.***

Prepared by	Signature	Date
Department Head	Signature	Date
Division Chair	Signature	Date
Vice President	Signature	Date