

PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

**CNC MILLING
MET 2700**

Class Hours: 2.0

Credit Hours: 4.0

Laboratory Hours: 6.0

Revised: Spring 2011

Catalog Course Description:

CNC Milling is a state-of-the-art machining course in three-axis programming and applications. Both manual and computer-assisted methods of part programming will be taught, with particular emphasis placed on laboratory projects to enhance hands-on operational experience. The course will include such topics as basic codes, absolute/incremental programming, canned cycles, tool database, post processing, and program transfer.

Entry Level Standards:

Students entering this course should have basic math and writing skills, a working knowledge of MS Word and AutoCAD or SolidWorks and basic machining skills.

Prerequisites:

ENGT 1100 and MET 1022

Corequisites:

MET 2310

Textbook(s) and Other Course Materials:

Textbook:

Haas VF-Series Operators Manual: Current Edition, Haas Automation, Inc.

References:

FeatureCAM User Guide: Current Version, Delcam.

FeatureCAM Post Processing Guide: Current Version, Delcam.

SolidWorks Essentials: Current Version, SolidWorks Corporation.

I. Week/Unit/Topic Basis:

Week	Topic
1-2	Machine Set-Up Manual Operation
3-7	FeatureCAM Programming

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|------|----------------------------------|
| 8-14 | SolidWorks Programming |
| 15 | Final Project; Final Exam Period |

II. Course Goals*:

The course will:

- A. Enhance understanding of the basic principles of CNC milling. (I, II)
- B. Expand skills to set-up, maintain, and functionally operate machine. (II - V)
- C. Develop knowledge and skills to create, program, and machine parts using computer-assisted methods. (II - V)
- D. Expand skills to inspect a part and analyze results. (I - V)
- E. Enhance skills to communicate technical information. (II - V)

* Roman numerals after Course Goals reference Engineering Technology Program Goals.

III. Expected Student Learning Outcomes*:

The student will be able to:

- 1. Define, explain, and associate the terminology used in CNC milling. (A)
- 2. Apply and associate the principles of CNC milling. (A)
- 3. Differentiate absolute and incremental programming. (A)
- 4. Identify all safety hazards associated with CNC milling operations. (B)
- 5. Identify, mount, and load correct tooling. (B)
- 6. Set tool length offsets and part program zero. (B)
- 7. Evaluate machining process during cutting operation and adjust settings to achieve maximum results. (B)
- 8. Create parts, define tool paths, input part program information, and verify cutting operation. (C)
- 9. Create tool data base. (C)
- 10. Post-process and generate a machine readable program. (C)
- 11. Set-up and initiate a transfer of program. (C)
- 12. Edit an existing program. (C)
- 13. Measure part features using standard gauging or CMM techniques. (D)
- 14. Accept/reject/rework parts based on standard or geometric tolerancing. (D)
- 15. Relate inspection results to machining process. (C, D)

16. Locate and extract needed information from operational and programming manuals. (E)
17. Document technical information in a neat and orderly format. (E)
18. Construct part and information drawings. (E)
19. Complete assignments based on oral and written instructions. (E)

* Capital letters after Expected Student Learning Outcomes reference the Course Goals listed above.

IV. Evaluation:

Evaluation of both classroom and laboratory work is required in this course. Total evaluation will be based on the following point distribution.

A. Programming Projects:

- Project 1: FeatureCAM Programming
- Project 2: SolidWorks Programming
- Project 3: Special Project

Guidelines and requirements for each project will be provided by the instructor.

B. Participation: (10 Points)

Based on instructor observation during the course, each student will be evaluated on participation activities. Evaluation parameters to include active participation in class discussions, being prepared, efficient use of lab time, striving to achieve more than minimum requirements, and regular attendance.

C. Field Work:

N/A

D. Other Evaluation Methods:

N/A

E. Grading Scale:

Final grade for this course will be based on the following alphabetic/numerical scale.

- A 93-100
- B+ 88-92
- B 83-87
- C+ 79-82
- C 74-78
- D 65-73
- F Below 65

V. Policies:

A. Attendance Policy:

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the

course. Individual departments/programs/disciplines, with the approval of the vice president of the Learning Division, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of the Learning Division.

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

C. Accommodations for disabilities:

Students who need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127, 132, 134, 135, 131 or by phone: 539-7153 or TTY 694-6429. More information is available at www.pstcc.edu/departments/swd/

D. Other Policies:

Safety and Equipment Abuse: Repeated safety violations will result in a reduction of final grade, at the instructor's discretion. Flagrant violations which result in equipment damage or personal injury will result in automatic failure of the course.