

IME 3580
Computer Aided Manufacturing
COURSE SYLLABUS-Spring, 2012

2011/2012_Catalog Data: Principles of operation of numerically-controlled systems for manufacturing. Application of CAD/CAM systems and graphics CNC in programming. Lecture/Lab: (2-3), Credit: 3 hrs

Textbook:

1. Nanfara, F., Uccello, T., and Murphy, D. (2002). The CNC Workshop. SDS Publications (Required)

Course Instructor and Coordinator:

Dr. Pavel G. Ikonov, Associate Professor / Office E221 / E-mail Pavel.Ikonov@wmich.edu,

Office Rm. # E221 Parkview, phone (269) 276-3284.

Office hours: Monday/Wednesday 12:30-2:30 PM, Thursday 1:30AM-2:30 PM.

(Additional office hours by appointment Monday - Friday (9:00 AM-9:00 PM))

Prerequisite by Topic:

1. Machining Fundamentals including machine feeds and speeds - IME 2540
2. Understanding of capabilities of Graphical Computer Systems - IME 2460
3. Capability to define and follow an algorithmic approach to problem solving - CS 1040 or CS 1110

Course Requirements:

- Attend all lectures, labs and demonstrations
- Participate in class discussions and all related activities
- Complete all assignments and meet all due dates
- Participate in group projects
- Use the library, Internet and, supplemental materials frequently

PERFORMANCE OBJECTIVES: Students who successfully complete this course will:

	Course Objectives	Performance Criteria	ABET/ TAC
1	Program CNC machines using EIA/ISO (G- and M-code) programming procedures	A1 Plan, design, analyze, and improve cost effective manufacturing methods	A
2	Operate graphical CAM systems to generate, simulate and verify EIA/ISO CNC programs		
3	Identify the major and secondary axes on Computer Numerically Controlled (CNC) machines		
4	Be able to modify CAM systems to tailor the post-processor for unique CNC machines		

Evaluation:

Homework assignments	10 points	93 -100% = A
Laboratory assignments	35	89-92%=BA
Pop Quiz's	5	83- 88%=B
Mid-Term examination	25	79-82%=CB
Final examination	25	73-78%=C
		69-72%=DC
		63-68%=D
		Below 63% = E

100 points

Homework: Various homework assignments will be made during the course of the semester. Homework will not be accepted late and must be submitted using e-Learning (WebCT-Vista).

Pop quizzes: All Pop Quizzes will be periodically administered as required to augment the previous week's assignment.

Class Participation: All students are expected to actively participate in the discussion of the topic of the day. The students will be evaluated on their individual degree of participation. Lab Activities: Various means will be used to evaluate the students lab work including (but not limited to) lab reports, lab quizzes, questioning about details of lab set-ups, etc.

(Note: Due the arrangement of the labs work, missing more than one or two labs may lead to discharge from the course)

Computer Usage:

Extensive use of computer hardware and software is required throughout this course. Most lab sessions take place at the machine lab and CAES Lab. CNCez simulation is required for most of the homework's.

Laboratory Usage:

Because of class size, labs simulation software is used in the machine and CAES Lab. Industrial grade equipment (CNC machines) are used by smaller groups of students during the course of the semester. The lab must be clean and all tools returned before leaving.

Oral and Written Communications:

Written reports are required for all laboratory exercises. There are no formal oral presentations required for this course; however, active participation is expected during the course of lectures.

SEMESTER SCHEDULE FALL 2010

Lecture: Monday/Wednesday 2:30 - 3:20 PM, C228, **Lab:** Thursday 8:30-11:20 F112, Final Exam Monday, April 23- 12:30-2:30 PM

	Topics for week - Lecture/Activity	Reading
1	Introduction, course requirements/expectations, tour lab	
2	Introduction to CNC	Ch. 1
3	CNC Fundamentals and Vocabulary.	Ch. 2
4	CNC and Robotics - motion and precision control	Handouts
5	Computational geometry for CNC machining	Handouts
6	Programming Concepts	Ch. 3
7	CNC Interactive Simulation Software CNCez	Ch. 4
8	Turning Part 1	Ch. 6
9	Mid-Term examination	
10	CNC Milling	Ch. 5, Handouts
11	CNC Milling/Turning Cutter Path Offset	Handouts
12	Introduction to CAD/CAM (Chapter 7) SURFCAM and Cimatron simulation	Handouts, Manuals
13	Robotic programming, CAM simulation, and Post processors (handouts) and Final Examination review	

Academic Integrity:

You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate and Graduate Catalogs that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. [The policies can be found at <http://catalog.wmich.edu> under Academic Policies, Student Rights and Responsibilities.] If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.