PIKES PEAK STATE COLLEGE
Machining Technology

Master Course Syllabus
MAC 2040: CAD/CAM 2D

Purpose of Document
This document contains important information about this course's objectives. It may be helpful for you to retain a copy for your records, along with the class specific syllabus. This document will be especially helpful if you decide to later change your course of study.

Pikes Peak State College and the Colorado Department of Higher Education have determined that graduates should have a broad range of learning skills as well as discipline related skills. Both types of skills are detailed below.

Course Description
Provides the student with the essential concepts and techniques that are required to successfully create part geometry, generate tool path, verify tool path models, and post process the NC codes. The student will be exposed to a 2-axis machining, 3-axis machining wire frame and surface modeling, lathe programming, and DNC systems. Programming projects and models will be demonstrated in the CNC manufacturing lab.
Credit Hours: 3
Contact Hours: 67.5 (Lecture/Lab Combination)

Required Course Learning Outcomes
1. Describe the CNC programming processes.
2. Describe basic 2-D geometry construction.
3. Demonstrate how to modify existing geometry models.
4. Demonstrate 2-axis toolpath generation.
5. Demonstrate how to edit 2-D toolpaths.
6. Construct 3-D wire frame models.
7. Generate toolpaths for lathe programming.
8. Use a complex direct numerical control (DNC).

Required Topical Outline
I. CAD/CAM Environments
   A. Working with Windows 95
   B. The CAD/CAM programming process
   C. The CNC manufacturing environment
II. Process and Toolpath Planning
   A. Part features and geometry creation
   B. Toolpath functions selection

C. Tooling and machining data
D. The process planning sheet
E. Identifying the post processor

III. Creating Basic 2-D Geometry
A. Creating points, lines, arcs, circles, fillets, chamfers, etc.
B. Creating text and dimensions for model

IV. Modifying Existing Geometry
A. Using color change, delete function, trim function, break function
B. Editing increments, join distance, location, rotation, and scale

V. Two-Axis Toolpath Generation
A. Basic 2-axis tool functions
B. Use of contour function, pocket function, drill function, face mill function
C. Generate toolpaths using combined function

VI. Constructing 3-D Wire Models
A. Wire frame fundamentals and constructions

VII. Toolpaths for CNC Lathes
A. Identifying lathe toolpath functions
B. Using common functions such as turn, face, groove, thread, drill, etc.

VIII. Direct Numerical Control
A. Saving part programs on a networked system
B. Downloading programs to a NC machine
C. Demonstrate the use of a DNC system