CNC III
Course Outcome Summary

Course Information
Organization Monroe County Community College, Applied Science and Engineering Technology
Developers Bob Leonard
Development Date 9/9/2009
Course Number MECH 105
Instructional Level Associate Degree
Potential Hours of Instruction 60
Total Credits 3

Description
This course will emphasize advanced G and M codes. Students will be editing programs using the laboratory computers. Communications between the PC to the controller and back to the PC will utilize knowledge of the post processor and data transfer. Students will use the PC to enter, via cable or other media, CNC data, program and machine sequence into a machining control. Students will complete process and fixture sheets. Projects will include CNC lathe, CNC mill, machining center and electronic wire discharge machine (EDWM). Students will integrate robotic motion to pick & place manufactured parts. Vocabulary and safety stressed.

Major Units
Work Coordinates for Mill & Lathe
Product Design Tools & LEAN Manufacturing
Advanced Programming Commands for Mill & Lathe
Direct Data Transfer
Fixed Cycles & Macro's Programming
Canned and Macro Cycles
Cutting Tool Geometry
Thread cutting, TNR & Turning Canned Cycles
Product Design Tools
Standard and Metric Screw Nomenclature
Composites, Plastics & High Strength Material
Automated Systems/ Robotics

Types of Instruction
Instruction Type Contact Hours Credits
Classroom Presentation
On-Campus Lab 60
Credits 3

Textbooks
Learner Supplies
Calculator with trigonometry functions. **Quantity**: 1. **Source**: Bookstore.
folder for handouts. **Quantity**: 1. **Price**: $1. **Source**: Bookstore.

Prerequisites
MECH 104

Exit Learning Outcomes

Program Outcomes
A. Demonstrate computer competency required for CAD-CAM.
B. Demonstrate technical skills to program and operate CNC equipment.
C. Demonstrate competencies in the operation and maintenance of automated and non-automated equipment
D. Analyze and implement solutions to 2 and 3-dimensional CAD-CAM & CNC programs
E. Demonstrate concepts and apply analytical problem solving methods
F. Demonstrate competency in applying LEAN manufacturing principals
G. Identify links with process speeds and material to process times
H. Comply with safe operations of all machine tools and equipment

General Education Outcomes
A. Communicate ideas in writing using the rules of standard English
B. Communicate information in writing using the rules of standard English
C. Apply mathematical approaches to the interpretation of numerical information
D. Apply mathematical approaches to the analysis of numerical information
E. Demonstrate an understanding of social science concepts
F. Demonstrate an understanding of the process of scientific inquiry
G. Use computer technology to retrieve information
H. Use computer technology to communicate information

External Standards

Competencies

1. Communicate the methods of NC data transfer to different CNC controllers.
2. Chart and coordinate process sheets and tooling for CNC machining.
3. Set up a CNC Lathe and Mill and produce parts using advanced programming including macros and variables.
4. Set up a Wire EDM and produce parts using electrical functions, taper, variables, and advanced macros.
5. Document part motion in all axes for Advanced CNC machinery.
6. Write, edit, upload & download programs to distributed CNC network using edit CAM software.
7. Evaluate and articulate the importance of computer programs between machine, controller, and robotic function.

8. Operate machines using recognized safety practices.