Wayne County Community College District

COURSE SYLLABUS

NC 111   Numerical Control Concepts

CREDIT HOURS: 3.00

CONTACT HOURS: 45.00

COURSE DESCRIPTION:

An introduction to the basic concepts of computer numerical control (CNC). A study of machine tools, controllers, programming languages, and a variety of aspects of CNC. This course is designed to broaden the students' background in numerical control.

PREREQUISITES:

EXPECTED COMPETENCIES:

Upon completion of this course, the student will:
1. Understand computer Numerical Control (CNC) past and present
2. State the objectives , advantages , and special uses of CNC
3. Describe the types of drive motors used to control tool movement
4. Understand the basic feedback systems on CNC equipment
5. Explain and demonstrate how EIA standards define CNC machine axes and direction
6. Explain the basic principles of Blue Print reading for numerical control
7. Describe and recognize machining centers (MC), their axes, and tooling
8. Understand and explain tool holder design and storage systems
9. Explain and use formulas to calculate speeds and feeds
10. Describe and recognize turning centers (TC) and machining centers(MC); axes, tooling, and cutting operations
11. Describe the basic similarities of all CNC machine controller units (MCU)
12. Know the difference between the MCU and the Machine Tool
13. Identify major areas of activities in a CNC machine shop
14. Explain the importance of CNC part process planning and machine process planning
15. Describe the usual tasks performed by a setup person and programmer
16. Understand the importance of machine zero, part zero, tool zero in setup
17. Identify the common procedures for "proving out" a CNC program before running
18. Understand the concepts of point-to-point, linear, and contour programming
19. Explain the significant difference in absolute and incremental dimensioning
20. State the advantages of using off-line programming
21. Explain the basic elements of a word address program
22. Distinguish significant differences in popular CNC programming languages today
23. Describe how to document tooling, setups, and part processing
24. Understand the importance of the right angle triangle calculations

ASSESSMENT METHODS:

Student performance may be assessed by examination, quizzes, case studies, oral conversation, group discussion, oral presentations. The instructor reserves the option to employ one or more of these assessment methods during the course.

GRADING SCALE:
90%-100% = A
80%-89.9%= B
70%-79.9%= C
60%-69.9%= D
<60% = E