**Oakton Community College**

**Introduction to CNC**

**I.     Course Prefix/Number:** MFG 144

**Course Name:** Introduction to CNC

**Credits:** 4 (2 lecture; 4 lab)

**II.    Prerequisite**

None

**III.   Course (Catalog) Description**

This hands-on course provides training in the setup, operation, and basic programming of computer numerical control (CNC) machines. Instruction will be given for both the CNC mill (vertical machining center) and the CNC lathe (turning center). After this class students will be able to: setup and operate CNC machines, use inspection equipment, and troubleshoot various production problems. Students will also learn how to read, interpret, and manually create CNC programs. Programs students develop and simulate off line will be run and debugged on the actual machine tools for which they were written.

**IV.   Learning Objectives**

This course will teach the basic understanding of a CNC control as well as the programming and hands-on experience on a machine tool with a CNC control.

**V.    Academic Integrity**

Students and employees at Oakton Community College are required to demonstrate academic integrity and follow Oakton's Code of Academic Conduct. This code prohibits:

• cheating,
• plagiarism (turning in work not written by you, or lacking proper citation),
• falsification and fabrication (lying or distorting the truth),
• helping others to cheat,
• unauthorized changes on official documents,
• pretending to be someone else or having someone else pretend to be you,
• making or accepting bribes, special favors, or threats, and
• any other behavior that violates academic integrity.

There are serious consequences to violations of the academic integrity policy. Oakton's policies and procedures provide students a fair hearing if a complaint is made against you. If you are found to have violated the policy, the minimum penalty is failure on the assignment and, a disciplinary record will be established and kept on file in the office of the Vice President for Student Affairs for a period of 3 years.
Details of the Code of Academic Conduct can be found in the Student Handbook.

**VI.   Sequence of Topics**

Session Description

1) Introduction to NC & CNC

2) History on NC and CNC; Control Systems, Loop Systems; Lab Milling Center

3) Cartesian Coordinate

4) Linear Interpolation; Lab Project 1

5) Methods of Setting up Tools in CNC Machines

6) 2 Axis Programming; Lab Project 2

7) Downloading “G” code Programs from PC

8) Midterm

9) Circular Interpolation; Lab project 3

10) Open Lab

11) Canned Cycles on Lathe; Lab Project 4

12) Canned Cycles on Mill

13) Open Lab

14) Review for Final Exam

15) Final Exam

**VII.  Methods of Instruction**

Lecture, demonstration on Lab Machine Tools.
Course may be taught as face-to-face, media-based, hybrid or online course.

**VIII. Course Practices Required**

1. Attendance required for success.
2. Completion of midterm and final exam.
3. Completion of 2 milling & 2 Turning Projects.

**IX.   Instructional Materials**

**Note:** Current textbook information for each course and section is available on Oakton's Schedule of Classes.

Textbook: The CNC Workbook
An Introduction to Computer Numerical Control.
Frank Nanfara, Tony Uccello, Addison Wesley Publishing Co.

**X.    Methods of Evaluating Student Progress**

A monthly quiz: 10%
Midterm Exam; 20%
Final Exam: 30%
Class Projects: 40%

**XI.   Other Course Information**

Numerical Control is an industrial technique that utilizes automatic controls to reproduce/replace the human functions/manipulations of various devices. This concept and technology covers many areas of the manufacturing process. It is the objective of this course to provide the student with the basic competencies needed to function in this type of industrial environment. It is not the purpose of this course to teach a specific Numerical Control device, but rather, to develop the students ability to adapt to any type of device that uses CNC as a control. Numerical Control is a precise process that has formats and rules of order to follow. It is the mastering of this process and the techniques that are common to all systems that is the focus of this course.

If you have a documented learning, psychological, or physical disability you may be entitled to reasonable academic accommodations or services. To request accommodations or services, contact the Access and Disability Resource Center at the Des Plaines or Skokie campus. All students are expected to fulfill essential course requirements. The College will not waive any essential skill or requirement of a course or degree program.

**XII. Instructor:**

Dave Geller

Chair, Manufacturing and CAD Technology

847-376-7707

dgeller@oakton.edu

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