SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

Course Title: INTRO TO C.N.C.

Code No.: MCH238   **Semester:**   2

PROGRAM: Aviation Machine Shop

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DATE: **December 00**   **Previous Outline Dated:** Jan. 99

APPROVED:

_____   _____
                          DEAN   **DATE**

TOTAL CREDITS: 3

PREREQUISITE(S): General Admission Requirements into a diploma program at an Ontario College or by special permission of the professor.

LENGTH OF COURSE: 18 weeks   TOTAL CREDIT HOURS: 108
3 classroom hours and 3
study hours per week

I.   **COURSE DESCRIPTION:** C.N.C. is designed to acquaint the student (who has a strong machining background) with the terms, practices and procedures of numerical control application. Sufficient background knowledge and experience is provided so that the student will have the necessary skills to learn any specific system or systems. This course is set up so the student can learn C.N.C. in a hands-on computer environment using simulated manufacturing projects and Industrial type machines.

II.   **LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

1. Discuss the basic concepts of computer numerical control, including the theoretical and applied aspects.
2. Understand the interface of the TORCAM CNCez simulation software program.
3. Program and run C.N.C. software.
4. Describe the basics of Computer Aided Design and Computer Aided Manufacturing

1.   Discuss the basic concepts of computer numerical control, including the theoretical and applied aspects.

Potential Elements of the Performance:
-describe the evolution of C.N.C., process of C.N.C., flow of processing and objectives of C.N.C.
-utilize the Cartesian coordinate system, the motion directions of the C.N.C. mill and lathe, types of coordinate systems, dimensioning theory, and vocabulary
-format a C.N.C. project, prepare to write a C.N.C. program, explain types of tool motion and uses of canned cycles.

This outcome constitutes 45% of the course.

2.   Understand the interface of the TORCAM CNCez simulation software program.

Potential Elements of the Performance:
-discuss the user interface of the C.N.C. simulation software
-install the simulation software
-use the interactive C.N.C. editor
-run a simple C.N.C. simulation
-edit programs to suite Industrial type machines

This outcome constitutes 15% of the course.

3.   Program and run C.N.C. software

Potential Elements of the Performance:
- write programs for milling and turning operations
- use linear and circular interpolation for the lathe
- utilize cutter diameter compensation for the lathe
- apply letter address commands for the C.N.C. lathe
- employ programming techniques for turning operations
- use linear and circular interpolation for the mill
- employ tool nose radius compensation for the mill
- use word address commands for the C.N.C. mill
- use multiple repetitive cycles

This outcome constitutes 40% of the course.

4. Describe the basics of Computer Aided Design and Computer Aided Manufacturing

Potential Elements of the Performance:
- describe the basics of computer-aided design
- explain the basics of computer-aided manufacturing

This outcome constitutes 5% of the course.

III. TOPICS:

1) Introduction to C.N.C.
2) C.N.C. Fundamentals and Vocabulary
3) Programming Concepts
4) Interactive Simulation Software
5) C.N.C. Turning
6) C.N.C. Milling
7) Introduction to CAD/CAM

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

The C.N.C. Workbook, An Introduction to Computer Numerical Control, Frank Nanfara, Tony Uccello, Derek Murphy, Addison-Wesley Publishing Company

Calculator, binder, paper, pens, 2- 3 ½" floppy disks

V. EVALUATION PROCESS:

Assignments/Tests   30%
Self-Study   10%
Projects (3)   40%
Attendance   20%

VI.   GRADING SYSTEM

The following semester grades will be assigned to students in postsecondary courses:

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
R (Repeat)	59% or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field placement or non-graded subject areas.	
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see *Policies & Procedures Manual - Deferred Grades and Make-up*).	
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has been impossible for the faculty member to report grades.	

VI.   SPECIAL NOTES

Special Needs:
If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 491 so that support services can be arranged for you.

Retention of course outlines:
It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

VII.   PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor.

VIII.   DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.