SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY
SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: Computerized Numeric Control

COPE NO.: MCH238 -SEMESTER: Winter 99

PROGRAM: Aviation Machine Shop

AUTHOR: Tim Candido

Tim. Candido@saultc. on. ca

705-759-2554 Ext. 530

PATE: 1999 01 06 **PREVIOUS OUTLINE PATEP: 1998 01 04**

APPROVEP: *^4^m^y\ffA^*   *Op/A   *££/ZK*

⁷ **PEAN**   **PATE**

TOTALCREPITS3

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

LENGTH OF COURSE: 16 weeks

TOTAL CREPIT HOURS: *96* hours-3 classroom hours and 3 self-study hours

COURSE NAME   ~~   CODE NO.

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.

H.   LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:
(Generic Skills Learning Outcomes placement on the course outline will be determined and communicated at a later date.)

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.

   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 mil 1 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.

COURSE NAME   CODE NO.

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.

m. TOPICS:

i) 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

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Calculator, binder, paper, pens

V.   EVALUATION PROCESS/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 - limited to 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.	

EVALUATION:

Assignments:

Late assignments will receive a grade of zero except in the case where the student has experienced extreme extenuating circumstances and has contacted the professor prior to the due date.

VI.   SPECIAL NOTES:

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- Special Needs
  If you are a student with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717, 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 post-secondary institutions.

- Course Modification
  The instructor reserves the right to modify the course as deemed necessary to meet the needs of students.

- Disclaimer for Meeting the Needs of the Learners

- Substitute Course Information is available at the Registrar's Office.

VH.   PRIOR LEARNING ASSESSMENT

Students who wish to apply for advanced credit in the course should consult the instructor. Credit for prior learning will be given upon successful completion of the following:

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