SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: *Introduction to C.N.C.*

CODE NO.:   **MCH 238**

PROGRAM: *Mechonicoi   Engineering   Technician-Machining*

SEMESTER: **Three**

DATE: *986 06 03*

AUTHOR: Greg White

NEW, *X X*   **REVISION:**

APPROVED.   *ft <£j?-&3*

  Chairperson   **Date**

CALENDAR   DESCRIPTION

MCH238   -3

INTRODUCTION   TO   CN.C.

A   theory   and   practical   course   utilizing   a   CN.C.   training   lathje   to   introduce   planning   for   N.C   ie,   cost   justification,   how   numerical   control   operates,   axis   relationships,   operating   sytems,   formatting,   coding,   two   and   three   axis   programming   utilizing   incremental   and   obso9lute.

Introduction to C.N.C.   *MCH238-3*

Course Name   **Course Number**

PHILOSOPHY/GOALS:

Designed to acquaint the student (who has o strong machining background) with the terms, practices and procedures of numerical control application. To provide sufficient background knowledge and experience so that the student will have the necessary skills to learn any specific system or systems.

METHOD OF ASSESSMENT (GRADING METHOD):

Students will be assessed on attendance, tests and on evaluation of programming assignments and projects submitted to their instructor. An evaluation will also be made on their fab practices and procedures.

TEXTBOOK(S):

EMCO C.N.C. - BASIC programming manual issued to students.

Computer Numerical Control by J. Pusztai, M. Sava Reston publishing - purchased by students.

OBJECTIVES:

To understand and apply topics as outlined and demonstrate a proven knowledge both theoretically and practically on N.C. programming operation ond maintenance.

SPECIAL   APPENDIX

3 Tests   =   W-

test 1   =   10%

test 2   =   70%

test 3   ⁻   20%

shop evaluation, attendance   (51   hours) - 1% per hour absent or late.

=   course material and preparation demands   approximately   8   hrs. outside   work/week

=   book extra lab times as applicable.

1st project piece due in week 4

2nd project piece due in week 9

3rd project piece due in week 12

4th *project piece due in week 16*

Reference texts: *Computer   Numerical Control, J. Puszta <£ M. Savo, Reston Publishing*

Essential of   *Numerical   Control,   R.   Rapello,   Prentice-Hall   Publishing*

Fundamentals of Numerical   Control,   W. Luggen,   Delmar Publishing.

Compact II Programming Manual
APT Programming Manual, I.B.M.   *corporation*

Basic Programming Manual, Emco C.N.C.

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
		History of C.N.C. *Principals of operation.* *Parts and functions of a typical machine .*	*Text* *Chapters 1 & 2* *Basic programming manual* *Lecture notes*
		Axis relationships requirements for N.C. binary and co-ordinate systems. *Inputting simple programs on a typical control.*	*Text* *Chapter 2* *Lecture Notes* *Basic programming manual.*
		Advantages and disadvantages to N.C. *Codes and Coding formotting sequences.*	*Lecture Notes*
		Planning and processing for N.C. *N.C. justification requirements for operators and/or programmers.*	*Lecture Notes* *Basic Programming manual.*
		Types of N.C. systems. *Types of feedback systems, incremental systems, review.*	*Lecture Notes* *Basic programming manual.*
		Test. *Absolute systems, zero shift systems.* *Stepping vs. profiling.*	*Lecture Notes* *Basic programming manual*
		Types of functions of tape readers, the tape tape formatting.	*Lecture Notes*
		Safety with N.C. programming systems *Tool touch-off procedures.*	*Lecture Notes*
		Tool guaging, turret location. *Home position.* *Machine Zero, offsets.*	*Lecture Notes*

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
10		*Tool referencing.* *Set-up sheets.* *Role of the operator.* *Review.*	*Lecture Notes* *Basic programming manual.*
11		*Test.* *System subroutines.*	*Text*
12		*M.D.S.I. compact II programming.*	*Lecture Notes* *Text*
13		*APT and graphics programming.*	*Text* *Lecture Notes*
74		*Tooling considerations.* *Fixturing.* *Tooling practices.*	*Lecture Notes*
15		*Industry standards: N, G, S, T, F, I, K, M, V, W.* *Tool tip and radius compensation.*	*Lecture Notes* *Basic programming manual* *Text*
		Test *What the future holds.*	*Lecture Notes* *Basic programming manual* *Text*