SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: COMPUTER AIDED DESIGN

Code No.: CET 300-6

Program: COMPUTER TECHNOLOGY

Semester: FIVE

Date: AUGUST, 1986

Author: E. LUDAVICIUS

New: _____   Revision: _____

APPROVED: _~~LPClroguth~~_____   _86/09/01_____
Chairperson   Date

COMPUTER AIDED DESIGN   CET 300 - 6
_____   _____
        Course Name   Course Number

PHILOSOPHY/GOALS:

The student will develop the ability to use the computer in a design role
in the electrical and electronic area, and to use software packages such as
micrologic, microcap and rhino (robotic software) programs to analyze and
design electrical and electronic circuits and robotic manipulation. The
course will prepare the student to use the computer within the design
environment, to be familiar with available software and introduce the
capabilities and limitations of the computer as a design and application
tool.

METHOD OF ASSESSMENT (GRADING METHOD):

The student will be assessed in the following manner:

1. Four (4) written tests worth 12.5% each.

2. Assignments dealing with the application of the software programs
    worth 50%

TEXTBOOK(S):

Course Notes and Handouts

Two Manuals - Micrologic
             - Microcap II

Four Floppy Disks (5 " - double sided, double density)

Block 1 - <u>Introduction to the IBM PC Hardware and Software</u>

At the end of this block the student shall be able to:
1. Describe the typical hardware architecture of the IBM PC
   a) System Board with CPU, Coprocessor, ROM, RAM
   b) Power Supply
   c) Disk Drives
   d) Cocor/Graphics monitor adapter
   e) Communication Adapter and Memory Expansion Card
   f) Keyboard

2. Describe the typical software components of the IBM PC.
   a) The IBM DOS operating system.
   b) The internal and external IBM DOS commands

3. Discuss the concept of batch files and describe the method of naming files on the IBM system.

4. Utilize IBM DOS to:
   a) Create files
   b) Display files on the terminal
   c) Print files
   d) Copy files
   e) Format disks
   f) Edit files
   g) Access the basic interpreter

5. Use the basic interpreter to program applications.
   (ie. menu driven program to solve Karnaugh Maps)

Block II - <u>Introduction Microwave Software</u>

At the end of this block the student shall be able to:

1. Describe the typical CAD principals such as
   a) importance of CAD to technology
   b) what makes a good CAD system
   c) an "ideal" CAD system
   d) selecting a CAD system

2. Describe micrologic general specifications and overall program flow.

3. Describe micrologic designer module which includes
   a) initialize data diskette
   b) run the program
   c) edit/review gate shapes
   d) designers commands

4. Describe micrologic analyzer module which includes:
   a) network editor
   b) disk operations
   c) start a simulation
   d) utilities
   e) test pattern editor
   f) gate library
   g) clock library
   h) analyzer commands

5. Use micrologic software to program logic applications.
   (ie. Eight Input Multiplexer)

Block III - Introduction to Micro CAP II Software

At the end of this block the student shall be able to:

1. Discuss the general capabilities and limitations of computer aided
   circuit analysis.

2. Describe Micro CAP II general specifications and overall program
   flow.

3. Describe Micro CAP II Designer Module which includes the following
   commands:

   a) HELP   i) NODES
   b) PAGE   j) CLR
   c) ENTER   k) FILE
   d) ZAP   l) ANALYSE
   e) SHORT   m) UTILITIES
   f) BEGIN   n) LIBRARY
   g) END   o) QUIT
   h) DRAW

4. Describe Micro CAP II Analyzer Modes which include:
   a) Transient Analysis
   b) AC Analysis
   c) DC Analysis
   d) Fourier Analysis

5. Use Micro CAP II software to program electrical and electronic
   applications.
   (ie. Evaluate the TSVS Power Supply Circuit for the 6800
    Microprocessor)

Block IV - <u>Introduction to Robotics</u>

At the end of this block the student shall be able to:

1. Define the term "Robotics".

2. Discuss the history of robots from the early 1800 to 1980's.

3. Describe the robot system and workcell including path control.

4. Discuss the classification of robots such as:
    a) rectangular
    b) cylindrical
    c) spherical

5. Describe the Robot Control System and Robot Hydraulic System.

6. Describe the specification of the Rhino XR Robot.

7. Program the Rhino XR Robot either by teach pendant or IBM PC Interface.

8. Demonstrate the use of the Rhino Robot for pick and place applications.