

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY  
SAULT STE. MARIE, ONTARIO

COURSE OULITNE

COURSE OUTLINE: COMPUTER AIDED DESIGN  
CODE NO.: CET 300-6  
PROGRAM: COMPUTER TECHNOLOGY  
SEMESTER: FIVE  
DATE: SEPTEMBER 1987  
AUTHOR: ENO LUDAVICIUS

NEW: \_\_\_\_\_ REV.: X

APPROVED:

*L. P. Chouette*  
CHAIRPERSON

88/01/05  
DATE

CALENDER DESCRIPTION

COMPUTER AIDED DESIGN  
COURSE NAME

CET 300 - 6  
COURSE NUMBER

PHILOSOPHY/GOALS:

THE STUDENT WILL DEVELOP THE ABILITY TO USE THE COMPUTER TO DRAFT IN THE ELECTRICAL AND ELECTRONIC AREAS USING AUTOCAD. ALSO TO USE THE COMPUTER TO OPERATE AND CONTROL ROBOTS AND ROBOTIC WORKCELLS. THE STUDENT WILL ALSO USE PACKAGES SUCH AS MICROCAP TO ANALYSE AND DESIGN ELECTRICAL & ELECTRONIC CIRCUITS THIS COURSE WILL FAMILIARIZE THE STUDENT 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) THREE WRITTEN TESTS WORTH 17% EACH.
- 2) ASSIGNMENTS & PROJECTS DEALING WITH THE APPLICATION OF THE SOFTWARE PROGRAMS WORTH 49%.

TEXTBOOK(S):

- 1) INSIDE AUTOCAD - D. RAKER & H. RICE
- 2) RHINO SOFTWARE MANUALS - VAL, ROBOTALK, TEACH PENDANT
- 3) AMATROL MANUALS - HERCULES ROBOT & WORKCELL
- 4) MICRO-CAP II ELECTRONIC CIRCUIT ANALYSIS MANUAL

BLOCK 1 - INTRODUCTION TO CAD AND AUTOCAD SOFTWARE

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

- 1) Describe the typical CAD principles 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 the typical hardware architecture of a CAD system:
  - a) System CPU, Coprocessor, ROM, RAM
  - b) Power supply
  - c) Disk drives (a,b,c)
  - d) Monitor driver
  - e) Multifunction card
  - f) Printer/Plotter/Digitizer (Tablet)
  
- 3) Describe the features of Autocad :
  - a) Program operation
  - b) Objects within a drawing
  - c) Auxiliary features
  - d) Advanced drafting extensions
  - e) Symbol Libraries
  
- 4) Describe Autocad main menu which includes the following tasks:
  - 0 - exit Autocad
  - 1 - begin a new drawing
  - 2 - edit an existing drawing
  - 3 - plot a drawing
  - 4 - printer plot a drawing
  - 5 - configure Autocad
  - 6 - file utilities
  - 7 - compile shape / font file
  - 8 - convert old drawing file
  
- 5) Utilize Autocad command entry from:
  - a) Screen menu
  - b) Tablet menu
  - c) Button menu
  - d) Keyboard menu
  - e) Repeated commands
  
- 6) Utilize Autocad software command groups:
  - a) Utility
  - b) Entity draw
  - c) Edit and Inquiry
  - d) Display controls
  - e) Layers, colors, linetypes

BLOCK 2 - ROBOTS AND ROBOTIC WORKCELLS

AT THE END OF THIS BLOCK THE STUDENT SHALL BE ABLE TO:

- 1) PROGRAM AND AND OPERATE THE RHINO XR-3 ROBOTIC ARM AND THE RHINO SCARA ROBOT WITH THE FOLLOWING SOFTWARE:
  - TEACH PENDANT
  - ROBOTALK
  - RHINO-VAL
  - GWBASIC
- 2) DESIGN & DEVELOP A RHINO WORKCELL USING THE X-Y TABLE AND THREE RHINO ROBOTS.
- 3) PROGRAM AND OPERATE THE AMATROL HERCULES ROBOT WITH THE FOLLOWING SOFTWARE:
  - COMPUTER INTERFACE PROGRAM
  - ALLEN BRADLEY PLC PROGRAM
  - GWBASIC
- 4) PROGRAM THE HERCULES WORKCELL USING ALLEN BRADLEY PLC.
- 5) PROGRAM AND OPERATE THE MERLIN FLEXIBLE ROBOT SYSTEM.

**Block II - 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  $\pm 5$  VS Power Supply Circuit for the 6800 Microprocessor)

Re : GRADING POLICY - SEPTEMBER 1987

Effective August 1, 1987, the following grades are to be assigned to all students in POST-SECONDARY programs. Further information regarding student assessment can be obtained from your Policy and Procedure Manual, Policy/Procedure No. 1-G-6 - Academic section.

Semester-End Reporting:

A+ (Numerical Equivalent 4.0) - Consistently Outstanding > 90% plus  
A (Numerical Equivalent 3.75) - Outstanding Achievement 80 to 100%  
B (Numerical Equivalent 3.0) - Consistently Above Average Achievement 65 to 79%  
C (Numerical Equivalent 2.0) - Satisfactory or Acceptable Achievement 55 to 64%  
R (Numerical Equivalent 0.0) - Repeat - Objectives of course not achieved and course must be repeated.

The following grades are also approved end-of-term grades but are not assigned numerical equivalence for computing the grade point average.

S - Satisfactory (assigned to non-graded courses or field placements)  
U - Unsatisfactory (assigned to non-graded courses or field placements when course objectives not achieved)  
X - Temporary grade assigned to student for additional time to complete course requirements used ONLY because of extenuating circumstances. "X" grade contract form must be completed and submitted for each X grade assigned.

Mid-Term Reporting:

Student progress will be reported as follows for mid-term reports:

S - Satisfactory Progress  
U - Unsatisfactory Progress  
R - Repeat (objectives have not been met)  
NR - Grade not reported to Registrar's Office. This grade is used to facilitate transcript production when faculty, because of extenuating circumstances, find it impossible to report grades by due dates.

For your information, "A" grades awarded prior to September 1987 will carry the numerical equivalent of 4.0 for purposes of calculating the grade point average.

If you have any questions, please contact Lorraine or I at extension 719 or 727.