SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE NAME: ELECTRONIC CAD TOOLS

CODE NO.: ELN-201

PROGRAM: ELECTRONICS TECHNICIAN/TECHNOLOGIST

SEMESTER: THREE

DATE: SEPTEMBER 1993

**PREVIOUS
OUTLINE DATED:** N/A

AUTHOR: EDWARD SOWKA

NEW: __X__ **REV.:** _____

APPROVED: W. Filipowich   Aug 30/93
CO-ORDINATOR   DATE

                                                    93-08-30
DEAN   DATE

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ELECTRONIC CAD TOOLS	ELN-201

TOTAL CREDIT HOURS: 48

PREREQUISITE(S):   ELR114, CET110

PHILOSOPHY/GOALS:

THIS COURSE IS DESIGNED TO INTRODUCE THE STUDENT TO THE
DESIGN, MANUFACTURE, ASSEMBLY AND TESTING OF ELECTRONIC
CIRCUITS, UTILIZING COMPUTER AIDED DESIGN TOOLS.   IT WILL
ALSO ENHANCE SOLDERING/DESOLDERING TECHNIQUES.

STUDENT PERFORMANCE OBJECTIVES:

UPON SUCCESSFUL COMPLETION OF THIS COURSE, THE STUDENT
WILL BE ABLE TO:

1. ACCURATELY PRODUCE SCHEMATIC DRAWINGS USING **HIWIRE II.**

2. ACCURATELY PRODUCE PRINTED CIRCUIT BOARD LAYOUTS USING
   SMARTWORK.

3. DEMONSTRATE THE PROPER PROCEDURES FOR EXPOSING,
   DEVELOPING AND ETCHING PCB'S.

4. DEMONSTRATE THE PROPER TECHNIQUES FOR ASSEMBLY OF PCB'S.

TOPICS TO BE COVERED:

1. "HIWIRE II" - SCHEMATIC DRAFTING SOFTWARE PACKAGE

2. "SMARTWORK" - PCB LAYOUT SOFTWARE PACKAGE

3. PCB PRODUCTION AND ASSEMBLY

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LEARNING ACTIVITIES	REQUIRED RESOURCES
1.0 ELECTRONIC SCHEMATIC DRAFTING	-**HIWIRE II** MANUAL
	-5.25" OR 3.5" DISKETTE (HD)
UPON SUCCESSFUL COMPLETION OF THIS BLOCK, THE STUDENT WILL BE ABLE TO:	-**HIWIRE II** HARDWARE KEY
1.1 Correctly boot the software package HIWIRE II.	-**HIWIRE II** LESSONS 1-5
	-Final assignment
1.2 Accurately produce a schematic diagram using HIWIRE II within the instructors specifications.	
1.3 Accurately obtain a printed output of the schematic diagram.	
2.0 ELECTRONIC PCB DRAFTING	-**SMARTWORK** manual
UPON SUCCESSFUL COMPLETION OF THIS BLOCK, THE STUDENT WILL BE ABLE TO:	-**SMARTWORK** LESSONS 1-5
	-Final assignment
2.1 Correctly boot the software package SMARTWORK.	
2.2 Accurately produce a PCB layout within the instructors specified parameters.	
2.3 Accurately obtain a printed output of the PCB layout.	
3.0 PCB MANUFACTURING	-Positive Photoresist PCB
UPON SUCCESSFUL COMPLETION OF THIS BLOCK, THE STUDENT WILL BE ABLE TO:	-Toolkit
	-Instructor handouts and Demonstration
3.1 Accurately produce a positive transparency of a PCB layout.	
3.2 Correctly expose, develop and etch a photoresist PCB (POSITIVE METHOD).	
3.3 Correctly drill PCB and mount components, employing proper shop practices.	
3.4 Accurately test and make operational a completed circuit.	

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ADDITIONAL RESOURCE MATERIALS:

WILL BE SUPPLIED BY INSTRUCTOR AS REQUIRED.

METHOD(S) OF EVALUATION

1. THE GRADING SYSTEM USED WILL BE AS FOLLOWS;

    A+ = 90 - 100%
    A = 80 - 89%
    B = 70 - 79%
    C = 55 - 69%
    R = REPEAT

2. DUE TO THE "HANDS-ON" APPROACH OF THIS COURSE, THE
   COURSE ASSESSMENT IS AS FOLLOWS;

    60% - PRACTICAL WORK (FINAL ASSIGNMENTS)
    20% - THEORY (TESTS, QUIZZES)
    20% - SUBJECTIVE EVALUATION **

**3. THE SUBJECTIVE EVALUATION WILL BE BASED ON THE STUDENTS
    ATTENDANCE, PARTICIPATION, PROFESSIONAL ATTITUDE AND
    WORK ETHIC, AND THE DEMONSTRATED ABILITY IN THE USE OF
    THE EQUIPMENT.

4. AT LEAST ONE WEEKS NOTICE WILL BE GIVEN FOR THEORY TESTS
   QUIZZES WILL BE GIVEN WITHOUT NOTICE.

5. AS THIS COURSE IS PRIMARILY A LABORATORY TYPE COURSE,
   ATTENDANCE IS COMPULSORY UNLESS PREVIOUSLY DISCUSSED
   WITH THE INSTRUCTOR.

REQUIRED STUDENT RESOURCES:

1 - 5.25" OR 3.5" DISKETTE (HD)
1 - TOOLKIT (BASIC HAND TOOLS)

**ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE
LIBRARY BOOK SECTION:**

ELECTRONIC ASSEMBLY; Concepts and Experimentation
By; Frederick W. Hughes   Prentice Hall 1992

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SPECIAL NOTES:

THE INSTRUCTOR RESERVES THE RIGHT TO MODIFY THE COURSE AS
IS DEEMED NECESSARY TO MEET THE NEEDS OF THE STUDENTS.

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SPECIAL NOTES:

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