

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

**COURSE NAME:** CAD Tools  
**CODE NO.:** ELN-210  
**PROGRAM:** ELECTRONICS / ELECTRICAL TECHNICIAN  
**SEMESTER:** THREE  
**DATE:** SEPTEMBER 1995  
**PREVIOUS  
OUTLINE DATED:** N/A  
**AUTHOR:** ENO LUDAVICIUS / ED SOWKA

NEW: X REVISION:     

APPROVED: Bill Armstrong 95-09-05  
CO-ORDINATOR DATE

L.P. Chaput 95-09-01  
DEAN DATE

**COURSE NAME**  
CAD TOOLS

**CODE NO.**  
ELN-210

---

**TOTAL CREDIT HOURS:** 48

---

**PREREQUISITE(S):** ELR-112 & CET-110

---

**PHILOSOPHY/GOALS:**

This course is designed to develop skills in the use of the AUTOCAD and HIWIRE computer aided drafting systems to draw schematic diagrams and design printed circuit boards (PCB's). The PCB manufacturing process will also be introduced. This course will prepare the student for the automated drafting and PCB layout environment.

**STUDENT PERFORMANCE OBJECTIVES:**

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

1. Define and discuss computer aided drafting and design terminology and principles.
2. Distinguish hardware and software components of a CAD environment.
3. Effectively, utilize AUTOCAD and HIWIRE menu structures and commands.
4. Accurately produce schematic diagrams and PCB layouts that can be used to manufacture products and circuits.

**TOPICS TO BE COVERED:**

1. Introduction to CAD/CADD terminology and principles.
2. Overview of workstation hardware and software.
3. AUTOCAD menu structures and commands.
4. HIWIRE menu structures and commands.
5. PCB manufacturing processes.

**COURSE NAME**  
CAD TOOLS

**CODE NO.**  
ELN-210

<u>LEARNING ACTIVITIES</u>	<u>REQUIRED RESOURCES</u>
<p>1. <u>Introduction to CAD/CADD terminology and Principles</u></p> <p>UPON SUCCESSFUL COMPLETION OF THIS BLOCK OF WORK, THE STUDENT WILL BE ABLE TO:</p> <p>1.1 Define CAD and CADD.</p> <p>1.2 Understand CADD/CADD applications.</p> <p>1.3 Distinguish the advantages / disadvantages of using AUTOCAD.</p>	<p>- Video: Coming To a Factory Near You</p>
<p>2. <u>Workstation hardware and software</u></p> <p>UPON SUCCESSFUL COMPLETION OF THIS BLOCK OF WORK, THE STUDENT WILL BE ABLE TO:</p> <p>2.1 Understand selection criteria of a CAD Workstation.</p> <p>2.2 Utilize the CAD/CADD/CAE survey.</p> <p>2.3 Discuss the hardware/software checklist and define the hardware and software components of a workstation.</p>	<p>- Instructor Handouts: CAD Principles</p>
<p>3. <u>AUTOCAD menu and commands</u></p> <p>UPON SUCCESSFUL COMPLETION OF THIS BLOCK OF WORK, THE STUDENT WILL BE ABLE TO:</p> <p>3.1 Outline various AUTOCAD features.</p> <p>3.2 Understand the Command Summary and Describe the menu structure.</p> <p>3.3 Use AUTOCAD to accurately draw electrical / electronic schematics.</p>	<p>- Text: AUTOCAD and Its Application Version 13 (DOS)</p> <p>- 3.5" Diskette</p> <p>...</p>

**COURSE NAME**  
CAD TOOLS

**CODE NO.**  
ELN-210

<b><u>LEARNING ACTIVITIES</u></b>	<b><u>REQUIRED RESOURCES</u></b>
<p>4. <u>HIWIRE 2 Schematic Drafting</u></p> <p>UPON SUCCESSFUL COMPLETION OF THIS BLOCK OF WORK, THE STUDENT WILL BE ABLE TO:</p> <p>4.1 Correctly boot the HW2 software package.</p> <p>4.2 Accurately produce a schematic diagram with given parameters.</p> <p>4.3 Save, retrieve and print/plot the schematic.</p>	<p>- Hiwire 2 Manual - 3.5" diskette - HW2 Hardware Key  - HW2 Lessons 1-5  - Final Assignment</p>
<p>5. <u>HIWIRE 2 PCB Drafting</u></p> <p>UPON SUCCESSFUL COMPLETION OF THIS BLOCK OF WORK, THE STUDENT WILL BE ABLE TO:</p> <p>5.1 Accurately produce a printed circuit board layout (single-sided) for simple circuits.</p> <p>5.2 Save, retrieve and print/plot the layout.</p> <p>5.3 Understand the process of manufacturing a PCB from layout to component mounting.</p>	<p>- HW2 Lessons 6 &amp; 7</p>

**COURSE NAME**  
CAD TOOLS

**CODE NO.**  
ELN-210

---

**ADDITIONAL RESOURCE MATERIAL:** N / A

**REQUIRED STUDENT RESOURCES:**

Text: AUTOCAD and Its Applications Version 13 (DOS)  
Goodheart - Wilcox  
1 - 3.5" Diskette (1.44M)

**RESOURCE MATERIAL AVAILABLE IN COLLEGE LIBRARY:**

There are several books written on CAD in general and specifically AUTOCAD.

**SPECIAL NOTES:**

1. The instructor reserves the right to modify the course (content and evaluation methods) as is deemed necessary to meet the needs of the students.
2. Students with special needs are encouraged to discuss required accommodations, confidentially, with the instructor. (ie. Physical limitations, Visual/Hearing impairments etc.).
3. Attendance to lab (practical) activities is compulsory, unless discussed with the instructor in advance of the absence. It is a fact that, attendance and your final grade are directly related.

**METHODS OF EVALUATION:**

1. The grading system is as follows;

A+	= 90% - 100%
A	= 80% - 89%
B	= 70% - 79%
C	= 55% - 69%
R	= Repeat (Student must repeat the course)
X	= Temporary grade assigned, at the instructors discretion, to a student who has not successfully completed the course because of extenuating circumstances (ie. serious illness etc.). (Refer to Student Handbook)
  
2. The final grade will be derived as follows;

50%	- AUTOCAD (2 Tests = 30%)	(Assignments = 20%)
50%	- HW2 (2 Tests = 40%)	(Assignments/Quiz = 10%)

