SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE OUTLINE:	AUTOMATED ELECTRICAL SYSTEMS
CODE NO.:	ELR320 - 6
PROGRAM:	ELECTRICAL TECHNOLOGY
SEMESTER:	FIVE
DATE:	SEPTEMBER 1990
PREVIOUS OUTLINE DATED:	SEPTEMBER 1989
AUTHOR:	ENO LUDAVICIUS

NEW:_____ REV.:____X____

APPROVED: W.F. _____ 90/09/12
CHAIRPERSON DATE

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TOTAL CREDIT HOURS: 90

PREREQUISITE(S): ELN 228

PHILOSOPHY/GOALS:

THE STUDENT WILL DEVELOP THE ABILITY TO USE THE COMPUTER IN A DRAFTING AND DESIGN ROLE IN A WIDE VARIETY OF INDUSTRIAL APPLICATIONS USING A LEADING TOOL FOR COMPUTER AIDED DRAFTING AND DESIGN; AUTOCAD.

THE STUDENT WILL USE ADVANCED PLC TECHNIQUES & SOFTWARE TO DESIGN & DOCUMENT AUTOMATED ELECTRICAL SYSTEMS.

THE STUDENT WILL ALSO INTERFACE PLC CONTROL TO AN INDUSTRIAL ROBOT. THIS COURSE WILL FAMILIARIZE THE STUDENT WITH INDUSTRIAL AUTOMATION OF ELECTRICAL, HYDRAULIC AND PNEUMATIC SYSTEMS.

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 THE HARDWARE AND SOFTWARE COMPONENTS OF A COMPUTER AIDED DRAFTING AND DESIGN ENVIRONMENT.

3) UTILIZE AUTOCAD MENU STRUCTURES AND DIFFERENT COMMAND ENTRY FORMS.

4) PRODUCE DRAWINGS THAT CAN BE USED EFFECTIVELY IN INDUSTRY TO MANUFACTURE, CONSTRUCT AND ASSEMBLE PRODUCTS.

5) PROGRAM ADVANCED PLC INSTRUCTIONS USING PLC DEVELOPMENT SOFTWARE.

6) PROGRAM AND RUN INDUSTRIAL ROBOTS WITH PLC'S AND AUTOMATION CONTROLLERS.

AUTOMATED ELECTRICAL SYSTEMS — COURSE NAME

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TOPICS TO BE COVERED:

1) INTRODUCTION TO CAD/CADD TERMINOLOGY AND PRINCIPLES.
2) OVERVIEW OF CAD/CADD WORKSTATION HARDWARE & SOFTWARE.
3) INTRODUCTION TO AUTOCAD MENU STRUCTURES UTILIZING DIFFERENT COMMAND ENTRY FORMS.
4) INTRODUCTION TO AUTOLISP FUNCTIONS.
5) OVERVIEW OF PLC CLASSIFICATIONS & MANUFACTURES.
6) RECAP OF AB PLC FAMILY HARDWARE & SOFTWARE.
7) INTRODUCTION TO ADVANCED SET OF INSTRUCTIONS FOR THE PLC 2 FAMILY.
8) INTRODUCTION TO THE TAYLOR DEVELOPMENT SOFTWARE.
9) INTRODUCTION TO FMS STRATEGIES AND IN-PROCESS CONTROL.
10) PROGRAMMING THE HERCULES ROBOT WITH PLC 2/15.
11) PROGRAMMING THE AMERICAN ROBOT WITH A TEACH PENDANT.

LEARNING ACTIVITIES	REQUIRED RESOURCES
1.0 INTRO TO CAD/CADD TERMINOLOGY & PRINCIPLES	
1.1) DEFINE THE TERMS CAD & CADD.	VIDEO: COMING TO A FACTORY NEAR YOU
1.2) DISCUSS CAD/CADD AT SAULT COLLEGE.	TEXT: COMING TO A FACTORY NEAR YOU
1.3) DISCUSS CAD/CADD APPLICATION.	
1.4) DISTINGUISH THE ADVANTAGES AND DISADVANTAGES OF USING AUTOCAD.	
2.0) OVERVIEW OF CAD/CADD WORKSTATION HARDWARE & SOFTWARE	
2.1) DISCUSS THE SELECTION OF A CAD/CADD WORKSTATION.	HANDOUTS: CAD PRINCIPLES
2.2) UTILIZE THE CAD/CADD/CAE SURVEY.	
2.3) DISCUSS THE CAD/CADD HARDWARE & SOFTWARE CHECKLIST.	
2.4) DEFINE THE HARDWARE & SOFTWARE COMPONENTS OF CAD/CADD WORKSTATION.	

6.0) RECAP OF AB PLC FAMILY HARDWARE & SOFTWARE.

SOFTWARE

TAYLOR DEVELOPMENT SERIES

6.8) PROGRAM DESCRIPTION & OVERVIEW
6.9) OFFLINE PROGRAMMING & DOCUMENTATION
6.10) ONLINE PROGRAMMING & DOCUMENTATION
6.11) PROGRAMMING FUNCTIONS
6.12) DOCUMENTATION & REPORT
2.2.6) UTILITIES - UP/DOWN LOADING PROGRAMS

REQUIRED STUDENT RESOURCES
(INCLUDING TEXTBOOKS & WORKBOOKS)

1) T. SHYMAKER/D.A. MADSEN AUTOCAD AND ITS APPLICATIONS
GOODHEART-WILCOX 1990

2) J. STEINHART, COMING TO A FACTORY NEAR YOU
TVONTARIO 1988

ADDITIONAL RESOURCE MATERIALS

1) W.& D. KRAMER, AUTOLISP CONCEPTS
AUSTIN, TEXAS, 78720, U.S.A. ARIEL COMMUNICATIONS 1989

2) D.RAKER & H.RICE, INSIDE AUTOCAD FIFTH EDITION
THOUSAND OAKS, CA91360, U.S.A. NEW RIDERS 1989

3) TAYLOR LADDER LOGIC DEVELOPMENT SERIES FOR PLC.

4) AMATROL MANUALS - HERCULES ROBOT & WORKCELL

5) AMERICAN ROBOT MANUALS

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METHOD(S) OF EVALUATION

THE FINAL GRADE OF THIS COURSE WILL BE DIVIDED BETWEEN THE AUTOCAD UNIT (35%), AND THE ADVANCED PLC UNIT (35%). AND THE ROBOT PROGRAMMING UNIT (30%).

THE FINAL GRADE FOR COURSE WILL BE DERIVED FROM THE RESULTS OF TEACHER ASSIGNED TESTS, AND ASSIGNMENTS PLUS PROJECTS:

TESTS	50%
ASSIGNMENTS & PROJECTS	50%
TOTAL	100%

THE GRADING SYSTEM USED WILL BE AS FOLLOWS:

A+	>= 90%	CONSISTENTLY OUTSTANDING ACHIEVEMENT
A	80-89%	EXCELLENT ACHIEVEMENT
B	70-79%	ABOVE AVERAGE ACHIEVEMENT
C	55-69%	SATISFACTORY ACHIEVEMENT
R		REPEAT
X		INCOMPLETE