

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



**SAULT
COLLEGE**

COURSE OUTLINE

COURSE TITLE: ELECTRICAL & ELECTRONIC CONTROLS II

CODE NO. : ELR213 **SEMESTER:** THREE

PROGRAM: MECHANICAL ENGINEERING TECHNICIAN –
MANUFACTURING

AUTHOR: R. CLOUTHIER

DATE: SEPT 2010 **PREVIOUS OUTLINE DATED:** SEPT 2009

APPROVED: _____
“Corey Meunier”
CHAIR _____
DATE

TOTAL CREDITS: ONE

PREREQUISITE(S): ELR111

HOURS/WEEK: TWO

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For additional information, please contact Corey Meunier, Chair
School of Technology & Skilled Trades
(705) 759-2554, Ext. 2610

I. COURSE DESCRIPTION:

This course covers the basic knowledge of electrical and electronic controls. Students will learn about safely removing and resetting electrical and electronic devices such as fuses circuit breakers and about lockouts and shutoff procedures. The student will diagnostic testing and application of electronic devices in control systems

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. To develop the student's basic knowledge concerning electrical and electronic theory.Potential Elements of the Performance:

- Review the use of basic electrical testing instruments
- Review and safely demonstrate the troubleshooting, removal, and resetting of electrical and electronic overload devices such as:
 - Fuses
 - Circuit breakers
 - Ground fault circuit interrupters GFCI
- Review and safely demonstrate the following
 - Basic general lock-out and tag-out equipment and procedures
 - General shut off procedures

2. To develop the student's basic knowledge concerning control systems.Potential Elements of the Performance:

- Introduce open and closed loop control systems.
- Differentiate between analog and digital signals
- Describe, briefly, the devices used in a control system such as:
 - Limit switches
 - Proximity switches
 - Photo cells
 - Inductive and capacitive sensors
 - Solenoids
 - Linear variable differential transformers (LVDT)
 - Vibration transducers
 - Displacement, velocity and accelerometer devices

Thermal devices such as:

- Thermostats
- Thermocouples
- Bimetallic strip devices
- Metal resistance thermometers
- Thermistors
- Thermal expansion devices

Miscellaneous transducers such as:

- Bourdon tube
- Pressure switches
- Diaphragm
- Bellows
- Piezoelectric
- Strain gauge

III. TOPICS:

1. Overload Devices / Disconnects
2. Open and Closed loop control systems
3. Digital and Analog Signals and where they apply to industry
4. Various types on instrumentation found in the industrial field

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- Handouts

V. EVALUATION PROCESS/GRADING SYSTEM:

Theory testing :	75%
Application experiences	<u>25%</u>
(Includes, class participation, attendance, labs)	100%

While marks are not given for attendance, marks may be deducted for classes missed. See Special Notes section.

The following semester grades will be assigned to students:

Grade	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	
A	80 – 89%	4.00
B	70 - 79%	3.00

C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

VI. SPECIAL NOTES:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

- Attendance is compulsory, unless discussed with the instructor in advance of the absence and the absence is for a medical or family emergency.
- Any student that is absent for will be required to provide a doctor's note immediately upon returning. Failing to do so will result in a grade of 0% being assigned to the missed activity.
- At the instructor's discretions a deduction of up to 5% may be made from the student's final mark for each class or portion thereof missed.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.

