

CODE NO.  
ELN-213

COURSE NAME  
Industrial Electronics

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

**COURSE NAME:** Industrial Electronics  
**CODE NO.:** ELN-213  
**PROGRAM:** Electrical / Electronics Technician  
**SEMESTER:** Three  
**DATE:** September 1995  
**PREVIOUS OUTLINE DATED:** September 1994  
**AUTHOR:** Edward Sowka  
  
**NEW:      REVISION: X**

**APPROVED:** Bill Croutling 95-09-05  
CO-ORDINATOR DATE

L.P. Quetta 95-09-05  
DEAN DATE

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**TOTAL CREDIT HOURS:** 64

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**PREREQUISITE(S):** ELN-109

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**PHILOSOPHY/GOALS:**

This course will introduce numerous electronic devices and circuits used in the industry. The student will study the devices, their electrical characteristics and industrial applications. Emphasis is placed on the analysis and troubleshooting of typical circuits, as well as some simplified design. This course prepares the student for troubleshooting circuits and systems in the Electrical / Electronic industry.

**STUDENT PERFORMANCE OBJECTIVES:**

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

1. Identify and understand the operation of the following devices ; UJT, PUT, 555 TIMER, 4-LAYER DIODE, SCR, DIAC, TRIAC, SBS, SUS, SCS, OPAMP and FIBRE OPTIC TRANSMITTERS / RECEIVERS.
2. Analyse and troubleshoot electronic circuits that employ these devices.
3. Perform simple design modifications to make operational, typical circuits.
4. Correctly use Device Specification Sheets to identify components, their characteristics, and replace defective components.

**TOPICS TO BE COVERED:**

1. Timing Circuits and Devices
2. Thyristors and Applications
3. Opamps and Applications
4. Optoelectronics and Fibre Optics

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<u>LEARNING ACTIVITIES</u>	<u>REQUIRED RESOURCES</u>
<p>1. <u>Timing Circuits and Devices</u></p> <p>UPON SUCCESSFUL COMPLETION OF THIS BLOCK OF WORK, THE STUDENT WILL BE ABLE TO;</p> <p>1.1 Understand the operation of the 555 Timer, UJT and PUT.</p> <p>1.2 Understand their electrical characteristics.</p> <p>1.3 Construct, troubleshoot and analyse simple circuits employing these devices.</p>	
<p>2. <u>Thyristors</u></p> <p>UPON SUCCESSFUL COMPLETION OF THIS BLOCK OF WORK, THE STUDENT WILL BE ABLE TO;</p> <p>2.1 Understand the operation of 4-layer diodes, SCR's, DIAC's, TRIAC's, SUS's, SBS's, SCS's, GCS's and GTO's</p> <p>2.2 Understand important electrical characteristics of these devices.</p> <p>2.3 Understand, construct, analyse and troubleshoot simple circuits employing these devices.</p>	
<p>3. <u>OPAMPS</u></p> <p>UPON SUCCESSFUL COMPLETION OF THIS BLOCK OF WORK, THE STUDENT WILL BE ABLE TO;</p> <p>3.1 Analyse, construct and troubleshoot simple OPAMP control circuits.</p>	

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<b>LEARNING ACTIVITIES</b>	<b>REQUIRED RESOURCES</b>
<p><b>4. Optoelectronics and Fibre Optics</b></p> <p>UPON SUCCESSFUL COMPLETION OF THIS BLOCK OF WORK, THE STUDENT WILL BE ABLE TO;</p> <p>4.1 Understand the operation and characteristics of various optoelectronic devices including photovoltaics, photo diodes and transistors, LASCR's, LED's, LASERS, opto-isolators and fibre optic transmitters and receivers.</p> <p>4.2 Understand, analyse, construct and troubleshoot simple circuits employing these devices.</p>	

**ADDITIONAL RESOURCE MATERIAL:**

First year Electronics notes and textbook.

Will be supplied by Instructor as required.

**REQUIRED STUDENT RESOURCES:**

Textbook: Industrial Solid State Electronics by T.J. Maloney (Prentice-Hall)

2<sup>nd</sup> year parts package

Duotang cover

**RESOURCE MATERIAL AVAILABLE IN COLLEGE LIBRARY:**

Suggested supplemental readings will be offered based on the topic being covered.

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**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%	- Theory (Tests and Quizzes)
40%	- Practical (Lab reports, Practical tests)
10%	- Subjective Evaluation (Attendance, participation, Attitude, Work ethic)
3. There will be 2 Major theory tests (Mid-Term and Final). Quizzes will be given without notice.
4. Lab reports will be outlined by your instructor.

