

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

Course Title : **Industrial Electronics**

Course No.: **ELN-213**

Program: **Electrical / Electronics / Instrumentation Technician**

Semester: **Three (3)**

Author(s): **Edward Sowka**

Date: **September 1999**

Previous
Outline Dated: **September 1998**

Approved:

Dean

Date

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For additional information, please contact Kitty DeRosario, Dean, School of Trades & Technology, (705) 759-2554, Ext. 642.

Course Name:
Industrial Electronics

Course No.:
ELN-213

TOTAL CREDITS: 5

PREREQUISITES: ELN-109 & ELR-109

COURSE LENGTH: 16 Weeks @ 4 Hours/Week

TOTAL CREDIT HOURS: 64

I. COURSE DESCRIPTION

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.

II. TOPICS TO BE COVERED:

1. Transistor Switching and Timing Circuits (Review of First Year)
2. SCR Characteristics and Applications
3. Other Thyristor Characteristics and Applications
4. Optoelectronics and Fiber Optics

III. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE:

A. Learning Outcomes:

1. Understanding operating characteristics and testing of UJT's, PUT's, SCR's, DIAC's TRIAC's, SBS's, SCS's, SUS's and GTO's.
2. Accurately analyse and test simple circuits utilizing these devices.
3. Correctly design and/or modify simple circuits utilizing these devices.
4. Understand the operation and characteristics of various optoelectronic and Fiber Optic components.

B. Learning Outcomes with Elements of Performance:

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

1. Correctly select and test electronic devices based on electrical operating characteristics

Potential elements of the performance:

- Understand the operation of various Thyristor devices
- Correctly select/replace Thyristor devices in applications.
- Perform IN/OUT circuit testing to determine the functionality of the devices.

2. Analyze, test and troubleshoot electronic circuits employing Thyristor devices.

Potential elements of the performance:

- Accurately analyse the operation of Thyristor circuits.
- Correctly test circuits for operation using common and specialized test equipment.
- Correctly and accurately troubleshoot malfunctioning circuits.

3. Design and modify simple Thyristor circuits.

Potential elements of the performance:

- Design simple Thyristor control circuits.
- Correctly modify existing circuits for changing operating characteristics.

4. Understand the operation and electrical characteristics of various Optoelectronic and Fiber Optic devices.

Potential elements of the performance:

- Understand the operation of Photocells, Opto-couplers, Photo-Transistors, LASCR's, and Fiber-Optic cable, transmitters and receivers.

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IV. REQUIRED STUDENT RESOURCES:

1. Industrial Electronics Parts Package (Available at Campus Shop for first 2 weeks).
2. First year Electronics Parts Package (Including DMM and Protoboard).
3. First Year Electronics Textbook (Introductory Electronic Devices by Paynter)

V. METHODS OF EVALUATION:

The following Grading System will be used:

- A+ = 90% - 100%
- A = 80% - 89%
- B = 70% - 79%
- C = 60% - 69%
- R = less than 60% (Repeat Course)
- X = Temporary Grade as per College Policy

The course is delivered using 2 methods; Theory and Laboratory. The theory component will consist of 2 tests (Mid-Term and Final) and quizzes. The laboratory component will consist of specific lab exercises and practical tests.

The following will be the method for determining your final Grade:

- 50% Theory = Test #1 (25%) + Test #2 (25%)
- 50 % Lab = Lab Exercises (20%) + Practical Tests (30%)

VI. SPECIAL NOTES:

1. The Instructor reserves the right to modify the course as is deemed necessary to meet the needs of the students.
2. Students with special needs (Physical Limitations, Visual/Hearing Impairments etc.) are encouraged to discuss confidentially, required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Extension 493, 717 or 491.
3. Attendance to lab activities is compulsory, unless discussed with the instructor in advance of the absence. Your attendance and final grade are directly related.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in this course, should consult with the Professor.