

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY
SAULT STE. MARIE, ONTARIO**



Sault College

COURSE OUTLINE

Course Title : **Measurements and Shop Practices**

Course Code: **ELR-114**

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

Semester: **One**

Author(s): **Ed Sowka**

Date: **September 1999** Previous Outline Dated: **September 1995**

Prerequisite(s): **None**

Course Length: **17 Weeks @ 2 Hours per week**

Total Credit Hours: **34**

Approved:

Dean

Date

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I. COURSE DESCRIPTION

This course will provide the student with a working knowledge of operating principles, characteristics and limitations of common electronic test equipment. The course introduces basic electronic components, their electrical characteristics and testing procedures, as well as, electronics' shop practices, including safety and the proper use of tools. Approximately 60% of time will be spent on laboratory exercises to develop hands-on skills.

II. TOPICS TO BE COVERED:

1. Electronic Component Identification
2. Electronic Test and Measuring Equipment
3. Soldering / Desoldering Techniques

III. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE:

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

1. Accurately identify common electronic components, their electrical characteristics, and testing procedures.

Potential elements of the performance:

- Correctly identify common components via their physical properties.
- Correctly identify electrical characteristics of common components.
- Accurately identify and draw the schematic symbol of common components.
- Accurately perform common testing of components.
- Recall and accurately apply the Resistor / Capacitor / Inductor Colour Code.

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2. Correctly and Accurately measure AC and DC Voltage, Current and Resistance using common Test Equipment.

Potential elements of the performance:

- Recall and apply basic techniques for measuring voltage, current and resistance.
 - Recall and understand the block diagram of a Voltmeter, Ammeter, Ohmmeter and Oscilloscope.
 - Accurately measure V, I, and R in Series Circuits, Parallel Circuits and Combination Resistive Circuits.
 - Define and understand the term “Loading Effect”.
 - Calculate the Ideal and Actual voltage and current in resistive circuits.
 - Accurately interpret voltage and current measurements to determine the degree of loading.
 - Correctly calibrate and accurately use an oscilloscope to measure amplitude and period of sinusoidal waveforms.
3. Correctly and safely identify and use typical hand tools, soldering and desoldering equipment to repair and maintain electronic equipment.

Potential elements of the performance:

- Correctly identify common hand tools and their use.
- Correctly and safely use common hand tools.
- Correctly and safely use soldering/desoldering equipment to make simple wire connection, cables and to remove/insert components on printed circuit boards (PCB's)

IV. REQUIRED STUDENT RESOURCES / TEXT / MATERIALS:

- First Year Electronic Parts Package (including Breadboard and Components)
- Basic Hand Tools (List will be supplied by instructor)
- Duotang Cover
- Solder Wick / Solder
- Additional resources will be outlined / distributed by the instructor

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V. METHODS OF EVALUATION:

The following Grading System will be used for students in post-secondary courses ;

- A+ = 90% - 100% (GPA = 4.0)
- A = 80% - 89% (GPA = 3.75)
- B = 70% - 79% (GPA = 3.0)
- C = 60% - 69% (GPA = 2.0)
- R = less than 60% (Repeat Course, GPA = 0.0)

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- CR = Credit (Credit for diploma requirements has been awarded)
- S = Satisfactory achievement in field placement or non-graded subject areas
- X = Temporary Grade as per College Policy
- NR = Grade not reported to Registrar

The final grade will be a combination of theory and practical tests, as well as a subjective evaluation*

- 40% = Theory (Consisting of tests and quizzes)
- 50% = Lab Activities (Consisting of Lab Reports and Practical Tests)
- 10% = Subjective Evaluations

*** The subjective evaluation is based on attendance, class participation, and professional work ethic as per industry expectations.**

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.

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4. It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions. Substitute course information is available in the Registrars Office

VII. PRIOR LEARNING ASSESSMENT:

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

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form, from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.