SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

COURSE TITLE: Measurements and Shop Practices

CODE NO. : ELR-114 **SEMESTER:** ONE

PROGRAM: Electrical / Electronics / Instrumentation Technician

AUTHOR: Edward Sowka

DATE: 09-2000 **PREVIOUS OUTLINE DATED:** 09-1999

APPROVED:

_____ _____

DEAN **DATE**

TOTAL CREDITS: 3

PREREQUISITE(S): NONE

HOURS/WEEK: 2

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. LEARNING OUTCOMES AND ELEMENTS OF THE 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.

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 de-soldering 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/de-soldering equipment to make simple wire connection, cables and to remove/insert components on printed circuit boards (PCB's)

III. TOPICS:

1. Electronic Component Identification
2. Electronic Test and Measuring Equipment
3. Soldering / De-soldering Techniques

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

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

V. EVALUATION PROCESS/GRADING SYSTEM:

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.**

The following semester grades will be assigned to students in postsecondary courses:

Grade	Definition	Grade Point Equivalent
A+	90 - 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
R (Repeat)	59% or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field placement or non-graded subject areas.	
U	Unsatisfactory achievement in field placement or non-graded subject areas.	
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see *Policies & Procedures Manual – Deferred Grades and Make-up*).	
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has not been possible for the faculty member to report grades.	

VI. SPECIAL NOTES:

Special Needs:
If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 491 so that support services can be arranged for you.

Retention of course outlines:
It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:
Students should refer to the definition of "academic dishonesty" in *Student Rights and Responsibilities*. Students who engage in "academic dishonesty" will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:
The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

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 the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

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.