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 TN & Trades/Power Generation/Wastewater

AUTHOR: Al Gooderham

DATE: Aug 2006 **PREVIOUS OUTLINE DATED:** Aug 2005

APPROVED:

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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 and electrical wiring practices. The course introduces basic electrical/electronic components, their electrical characteristics and testing procedures, as well as electronics' shop practices, including safety and the proper use of tools.

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.
   - Accurately measure V, I, and R in Series Circuits, Parallel Circuits and Combination Resistive Circuits.
   - Define and understand the term "Loading Effect".
   - Correctly wire and test a switch, light and receptacle
   - Correctly wire and test a 3-way switch and light

LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE: continued

- Correctly wire and test a split receptacle and a switched receptacle
- 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 connections, cables and to remove/insert components on printed circuit boards (PCB's)

4. Use soldering, wiring and assembly techniques to build a working DC power supply for electronic equipment.

   Potential Elements of the Performance:

   - Correctly insert components on the PCB.
   - Correctly solder components on the PCB.
   - Connect and demonstrate the operation of the completed supply noting simple wire connections, including cabinet completion.

III. TOPICS:

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

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- First Year Electronic Parts Package (including Breadboard, Components, Safety Glasses, leads etc)
- Basic Hand Tools (Not in Parts Package - List will be supplied by instructor)
- Duo tang Covers
- Electronics Pocket Handbook by D. Metzger (optional reference)
- Additional resources will be outlined / distributed by the instructor

V. EVALUATION PROCESS/GRADING SYSTEM:

25% = Practical lab tests and quizzes
50% = Lab Reports
25% = Power Supply Completion

All lab reports required for submission and the power supply must be completed and handed-in or an Incomplete grade will result.
All lab reports are to be submitted in a three-ring duo tang.

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%	
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.

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 professor and/or the Special Needs office. Visit Room E1101 or call Extension 2703 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.

Absence:

No re-write will be given for completed tests.

Any student that is absent for any test or surprise quiz (maximum 5% of final grade) must contact either the Instructor, the Deans' office or the switchboard PRIOR to the test, and may be required to provide a doctors' note upon returning. Failing to do so will result in a grade of 0% being assigned to the missed test with no rewrite option.

Any student that is absent for any lab must contact the Instructor for a copy of the lab and to arrange a time to complete the lab. As these are hands-on labs, you simply **do not copy the results from your partner**. As such, the sign-in sheet provided for each lab is essential for you to sign.

Laboratory Reports

All Lab Reports are due at the start of the following weeks Lab Class unless otherwise stipulated by the instructor. A ***penalty of 10% per day*** will be assessed for late submissions (Weekends included).

All Lab Reports must be submitted in a Duo Tang cover.

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.