

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** ELECTRONICS 2  
**CODE NO. :** ELR721 **SEMESTER:**  
**PROGRAM:** CONSTRUCTION AND MAINTENANCE ELECTRICIAN  
**AUTHOR:** DOUGLAS FAGGETTER  
**DATE:** OCT. 2005 **PREVIOUS OUTLINE DATED:**  
**APPROVED:**

\_\_\_\_\_  
**DEAN** **DATE**

**TOTAL CREDITS:**  
**PREREQUISITE(S):**  
**HOURS/WEEK:** 3

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*For additional information, please contact C. Kirkwood, Dean*  
*School of Technology, Skilled Trades, Natural Resources & Business*  
*(705) 759-2554, Ext. 2688*

**I. COURSE DESCRIPTION:**

A course in the applications of diodes in rectifier circuits and power supplies. Other topics include Zener diodes, Field Effect Transistors, op-amps and thyristors including the SCR, DIAC and TRIAC

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

1. Use an oscilloscope to test circuits.
2. Explain the importance of isolation as applied to test equipment.
3. Describe and demonstrate full-wave rectification.
4. Connect capacitors and inductors to filter a power supply output.
5. Explain and demonstrate the use of a Zener diode as a regulator.
6. Describe and demonstrate the operation of an SCR.
7. Describe and demonstrate the operation of a DIAC.
8. Describe and demonstrate the use of a TRIAC.
9. Describe and demonstrate how a DIAC and RC network can be used to phase shift a TRIAC.
10. Describe the operation and applications of a Pulse Transformer and the theory of pulse triggering thyristors.
11. Explain the operation of a Field Effect Transistor (FET).
12. Explain the operation of an Operational Amplifier (Op. Amp).
13. Calculate the expected gain of inverting and non-inverting Op-Amp circuits.
14. Demonstrate the operation of an Op-Amp used as a Comparator.
15. Demonstrate the operation of an Op-Amp used as an amplifier.

**III. TOPICS:**

1. The Oscilloscope
2. Single-Phase Rectifiers
3. Filters
4. Zener Diodes
5. The Transistor Amplifier
6. Field Effect Transistors
7. The Unijunction Transistor
8. The SCR in a DC circuit
9. The SCR in an AC circuit
10. Phase Shifting an SCR
11. UJT Phase Shifting for an SCR
12. SCR Control of a Full-wave Rectifier
13. The DIAC
14. The TRIAC
15. Phase Shifting the TRIAC
16. The Operational Amplifier (Op-Amp)
17. An Op-Amp used as a Comparator

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

Electronics for Electricians  
by Stephen L. Herman

**V. EVALUATION PROCESS/GRADING SYSTEM:**

Theory 50%

Lab 50%

The following semester grades will be assigned to students:

| <b>Grade</b> | <b>Definition</b>  | <i>Grade Point Equivalent</i> |
|--------------|--|-------------------------------|
| 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.  |                               |

**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 professor and/or the Special Needs office. Visit Room E1101 or call Extension 703 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.

*<include any other special notes appropriate to your course>*

**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.