

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: AC CIRCUITS AND MACHINES

CODE NO. : ELR109 **SEMESTER:** Two

PROGRAM: Electrical / Electronics / Instrumentation Technician

AUTHOR: A. Gooderham, 759-2554 ext. 581

DATE: Jan. 2000 **PREVIOUS OUTLINE DATED:** Jan./99

APPROVED:

	_____	_____
	DEAN	DATE

TOTAL CREDITS: 4

PREREQUISITE(S): ELR100

LENGTH OF COURSE: 16 Weeks **TOTAL CREDIT HOURS:** 64

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For additional information, please contact
School of Technology and Technical Trades
(705) 759-2554, Ext.642

I. COURSE DESCRIPTION:

An analytical study of series and parallel, and series-parallel AC circuits, impedance networks, network theorems and poly-phase circuits. Fundamentals of DC circuit analysis in RC circuits is followed by AC analysis techniques in RL, RC and RLC circuits. An overview of the basic construction and operation of DC and AC machines completes the course content.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Analyse fundamental RL, DC circuits.

Potential Elements of the Performance:

- Completion of RL cct questions regarding time constants
- Completion of RL cct questions requiring the solution of the time for threshold voltage or current achievement
- Completion of test

2. Analyse fundamental single-phase AC circuits.

Potential Elements of the Performance:

- Completion of complex math questions including the j operator
- Completion of basic trigonometry questions
- Completion of polar and rectangular conversions
- Analysis of single-phase circuit operation using complex math, to find impedance(s), voltage and current values
- Complete formal test

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3. Analyse fundamental three-phase AC circuits.

Potential Elements of the Performance:

- Completion of three-phase cct questions regarding line and phase values
- Completion of three-phase cct questions having combinations of delta and wye generators and impedance loads
- Completion of test

4. Describe basic parts and operation of DC and AC machines.

Potential Elements of the Performance:

- Completion of AC machine diagrams identifying parts of the machine
- Description of AC machine operation and characteristics
- Completion of power factor correction calculations and relationships
- Completion of test

III. TOPICS:

1. Inductance
2. RL DC Circuits
3. AC fundamentals (review)
4. Phasors & Complex Numbers
5. RL , RC & RLC AC Circuits, Resonance & Filters
6. Series-Parallel AC Circuits
7. Power in AC Circuits
8. AC Networks
9. Three-Phase AC Systems
10. Transformers
11. AC Motor/Generators
12. Three-Phase AC Motors (if time permits)

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IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Principles of Electric Circuits, 6th Ed., by Floyd

V. EVALUATION PROCESS/GRADING SYSTEM:

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

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
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 <i>Policies & Procedures Manual – Deferred Grades and Make-up</i>).	
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has been impossible for the faculty member to report grades.	

Three Tests @ 33% each + Review Assignment @ 1%: TOTAL 100%

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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.

<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 instructor. Credit for prior learning will be given upon successful completion of the following:

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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.