SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

COURSE TITLE:	Electrical Fundamentals		
CODE NO. :	ELR100	**SEMESTER:**	1
PROGRAM:	Electrical Process Automation/Trades, Instrumentation/Power Generation		
AUTHOR:	A. Gooderham		
DATE:	Jun 2008	**PREVIOUS OUTLINE DATED:**	May 2007
APPROVED:			
	"Corey Meunier" CHAIR		**Jun 11 08 DATE**
TOTAL CREDITS:	5		
PREREQUISITE(S):	none		
HOURS/WEEK:	5		

Copyright ©2008 The Sault College of Applied Arts & Technology
Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.
For additional information, please contact Corey Meunier, Chair
School of Technology & Skilled Trades
(705) 759-2554, Ext. 2610

I. COURSE DESCRIPTION:

An introductory course designed to give an overview of terms, devices, symbols and analysis techniques used in DC circuits. Topics include series, parallel and series-parallel DC circuit analysis. Other topics include an introduction to magnetism and magnetic devices, inductors and capacitors and their principle operation in DC circuits

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Analyze Series, Parallel and Series-Parallel DC circuits containing voltage and current sources and resistors, to determine individual voltage, current and power values.
   Potential Elements of the Performance:
   Complete mathematical questions from text and assignments
   Choice and use of network Theorems to aid in analysis
   Completion of written test

2. Analyze magnetic properties of circuits and devices
   Potential Elements of the Performance:
   Determine the direction of magnetic flux present as a result of DC current flow in a conductor
   Determine the direction and strength of magnetic flux present as a result of DC current flow in a coil
   Determine the direction of rotation of a simple dc motor
   Determine the direction of current flow in a simple dc generator
   Completion of dc machine diagrams showing flux & main fields and rotation
   Completion of written test

3. Analyze a DC circuit containing inductors or capacitors and resistors, to determine charge and discharge characteristic values
   Potential Elements of the Performance:
   Completion of RL and RC circuit questions regarding time constants
   Completion of RL and RC circuit questions requiring the solution of the time for threshold voltage or current achievement
   Completion of written test

III. TOPICS:

1. Definition of voltage, current, resistance, sources, symbols
2. Ohm's Law
3. Series Circuits, Kirchhoff's Laws, Real vs. Ideal Circuits
4. Energy and Power, Efficiency
5. Parallel Circuits, Conductance
6. Series-Parallel Circuits
7. Circuit Theorems, Thevenin's, Max Power Transfer, Superposition
8. Magnetics, materials and circuits, Right Hand Rule, Motor/Generator action
9. Inductors, Series and Parallel, Mutual Inductance, energy storage
10. Capacitors, Series and Parallel, energy stored
11. Inductor-Resistor Circuits, Time Constants, Instantaneous Values of Current and Voltage, Back emf
12. Capacitor-Resistor Circuits, Time Constants, Instantaneous Values of Current and Voltage, Back emf

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Principles of Electric Circuits, 8th Ed. By Floyd

V. EVALUATION PROCESS/GRADING SYSTEM:

Three Tests @ 33.33 % each, for **: TOTAL 100%**

Surprise Quiz's may be given for a maximum of 5% of the final grade and are attributed toward the next test percentage value

The following semester grades will be assigned to students:

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.

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 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.

Communication:
The College considers ***WebCT/LMS*** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the ***Learning Management System*** communication tool.

Plagiarism:
Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. 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:
If a student misses a test or surprise quiz (maximum 5% of final grade) without contacting the instructor, the Dean's office or the switchboard **prior to the test or quiz**, a mark of zero will be granted without a re-write option.

No re-write will be given for completed tests.

VII. PRIOR LEARNING ASSESSMENT:

Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. ADVANCE CREDIT TRANSFER:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question.