SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	ELECTRICAL THEORY I		
CODE NO. :	ELR620	**SEMESTER:**	BASIC
PROGRAM:	CONSTRUCTION AND MAINTENANCE ELECTRICIAN APPRENTICESHIP (6520)		
AUTHOR:	JUHANI (JOHN) PALONIEMI		
DATE:	JAN 2011	**PREVIOUS OUTLINE DATED:**	JAN 2010
APPROVED:	"Corey Meunier" **CHAIR**		_____ **DATE**
TOTAL CREDITS:	EIGHT		
PREREQUISITE(S):	N/A		
HOURS/WEEK:	SIX		

For additional information, please contact Corey Meunier, Chair
School of Technology & Skilled Trades
(705) 759-2554, Ext. 2610

I. COURSE DESCRIPTION:

This is an electrical theory course in DC electric circuits. Atomic theory will be introduced along with voltage, current, resistance, power and energy in electric circuits. Ohm's Law and Kirchhoff's Laws will be studied as they relate to series, parallel and combination circuits. Wire sizing, resistivity and magnetism will also be introduced.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Demonstrate an understanding of atomic theory.
2. Describe the requirements for a simple electric circuit.
3. Define voltage, current and resistance.
4. Define work, power and energy.
5. Convert between mechanical and electrical units of work, power and energy.
6. Calculate energy in kilo-watt hours.
7. Describe the effects of current on the human body.
8. Apply Ohm's Law to analyze series DC circuits.
9. Apply Kirchoff's Law to analyze series DC circuits.
10. Apply Ohm's Law to analyze parallel DC circuits.
11. Apply Kirchoff's Law to analyze parallel DC circuits.
12. Apply Ohm's Law to analyze combination DC circuits.
13. Apply Kirchoff's Law to analyze combination DC circuits.
14. Analyze and calculate voltage, current and power in 2-wire and 3-wire distribution systems for balanced, unbalanced and faulted.
15. Define and calculate efficiency of electrical distribution systems.
16. Perform calculations relating to wire measurements, AWG, SI units, resistivity, line loss, and temperature coefficients.
17. Name and explain the principles of operation of common sources of EMF.
18. Describe the characteristics of primary and secondary cells.
19. State the Fundamental Law of Magnetism.
20. Define permanent and temporary magnets.
21. Describe magnetic lines of force and list their characteristics.
22. Describe the relationship between magnetism and induced EMF.

III. TOPICS:

1. ATOMIC STRUCTURE
2. ELECTRICAL QUANTITIES AND OHM'S LAW
3. STATIC ELECTRICITY
4. RESISTORS
5. SERIES CIRCUITS
6. PARALLEL CIRCUITS
7. COMBINATION CIRCUITS
8. USING WIRE TABLES AND DETERMINING CONDUCTOR SIZES
9. CONDUCTION IN LIQUIDS AND GASES
10. BATTERIES AND OTHER SOURCES OF ELECTRICITY
11. MAGNETISM
12. MAGNETIC INDUCTION

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Delmar's Standard Textbook of Electricity (Current edition), Stephen L. Herman

V. EVALUATION PROCESS/GRADING SYSTEM:

The grading weight for the course is:
Theory tests and quizzes: 90%.
Homework assignments: 10%.

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:

Attendance:
Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers will not be granted admission to the room.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.