

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: ELECTRICAL FUNDAMENTALS

Code No.: ELR 100-5

Program: ELECTRICAL/ELECTRONIC COMMON

Semester: ONE

Date: AUGUST 1989

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W.F.

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New: _____ Revision: _____

APPROVED: *R.P. Casquette*
CHAIRPERSON

89/08/30
DATE

ELECTRICAL FUNDAMENTALS

ELR 100-5

Course Name

Course NumberPHILOSOPHY/GOALS:

When the student has completed this course, he should be familiar with the basic concepts of DC and AC circuits, which are necessary so that the student can continue to progress through the Electrical/Electronic Technology Program.

METHOD OF ASSESSMENT (GRADING METHOD):

Students will be assessed on a series of written exams and quizzes.

Grades will be "A+", "A", "B", "C", or "R".

A+	90 - 100%
A	80 - 89%
B	65 - 79%
C	55 - 64%
R	REPEAT

TEXTBOOK(S):

Fundamentals of Electric Circuits - David A. Bell
4th Edition

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TOPIC NO.	PERIODS	TOPIC DESCRIPTION
1		<p><u>Electrical Units</u></p> <ul style="list-style-type: none"> -- Electrification by Friction -- Planetary Atom -- Potential Difference, Current and Resistance -- Basic Source of Electricity -- Electric Lamp -- Electric Circuit -- Circuit Diagrams -- Current Direction -- Direct Current & Alternating Current -- Electric Shock -- Scientific Notation, Metric-Prefixes, and Engineering Notation -- Resistance & Conductance -- Ohm's Law -- Application of Ohm's Law -- Electrical Power & Energy
2		<p><u>Conductors</u></p> <ul style="list-style-type: none"> -- Atomic Bonding -- Insulators -- Conductors -- Conductor Resistivity -- Temperature Effects on Conductors -- Resistor Construction -- Color Code -- Resistor Power Ratings -- Temperature Coefficient of Resistors

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TOPIC NO.	PERIODS	TOPIC DESCRIPTION
3		<p><u>Series Circuits</u></p> <ul style="list-style-type: none"> -- Current in a Series Circuit -- Voltage Drops in a Series Circuit -- Voltage Divider -- Potentiometer -- Power in a Series Circuit -- Voltage Dropping & Current Limiting -- Open-Circuits & Short-Circuits in a Series Circuits
4		<p><u>Parallel Circuit</u></p> <ul style="list-style-type: none"> -- Voltage & Current in a Parallel Circuit -- Parallel Equivalent Circuit -- Conductances in Parallel -- Current Divider -- Power in Parallel Circuits -- Open-Circuits & Short-Circuits in a Parallel Circuit
5		<p><u>Series-Parallel Circuits</u></p> <ul style="list-style-type: none"> -- Equivalent Circuit of a Series-Parallel Circuit -- Currents in a Series-Parallel Circuit -- Voltage Drops in a Series-Parallel Circuit -- Open-Circuits & Short-Circuits in a Series-Parallel Circuit -- Analysis of a Series-Parallel Circuits
6		<p><u>Network Theorems</u></p> <ul style="list-style-type: none"> -- Network Analysis using Kirchoff's Law -- The Superposition Theorem -- Thevenin's Theorem -- Norton's Theorem

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TOPIC NO.	PERIODS	TOPIC DESCRIPTION
7		<u>Magnetism</u> <ul style="list-style-type: none">-- Magnetic Field-- Electromagnetism-- Theory of Magnetism-- Magnetic Flux and Flux Density-- Magnetomotive Force and Magnetic Field Strength-- Force on a Current - Carrying Conductor in a Magnetic Field
8		<u>Magnetic Circuit</u> <ul style="list-style-type: none">-- Reluctance and Permeability-- Permeability of Free-Space-- Solenoid-- Relative Permeability-- Magnetization Curves-- Hysteresis-- Eddy Currents
9		<u>Inductance</u> <ul style="list-style-type: none">-- Electromagnetic Induction-- Induced EMF and Current-- Self-Inductance-- Mutual Inductance-- Types of Inductors-- Energy Stored in an Inductive Circuit-- Inductors in Series and in Parallel-- Stray Inductance-- LR Circuits

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TOPIC NO.	PERIODS	TOPIC DESCRIPTION
10		<u>Capacitance</u> <ul style="list-style-type: none">-- Electric Charge Storage-- Electric Field-- Capacitance & Capacitor Dimensions-- Capacitor Types & Characteristics-- Capacitors in Series & in Parallel-- Energy Stored in a Charged Capacitor-- Stray Capacitance-- RC Circuits
11		<u>Alternating Current and Fundamentals</u> <ul style="list-style-type: none">-- Generation of Alternating Voltage-- Sine Wave-- Frequency, Phase Angle, and Wavelength-- Resistive Load with AC Supply-- Peak, Average, and RMS Values of Sine Waves-- Cathode Ray Oscilloscope
12		<u>AC Circuit Analysis</u> <ul style="list-style-type: none">-- Phasors and Complex Numbers-- Polar and Rectangular Notation-- Series and Parallel RL, RC, RLC Circuits-- Resonance