

Library

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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 1987

Author: NORM BARKER

New: _____ Revision: ^X _____

APPROVED:

R.P. Anzietto

CHAIRPERSON

87-09.02

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 lab work.

Seventy percent of total mark is for theory and thirty percent for lab work. Attendance is compulsory for all labs, and at least eighty percent attendance for lectures.

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

| | |
|---|---------------|
| A | 80 - 100% |
| B | 66 - 79% |
| C | 55 - 65% |
| R | less than 55% |

TEXTBOOK(S):

Fundamentals of Electric Circuits - David A. Bell
3rd Edition

ELECTRICAL FUNDAMENTALSELR 100-5

| TOPIC NO. | PERIODS | TOPIC DESCRIPTION |
|-----------|---------|--|
| | | <u>THEORY</u> |
| 1 | 10 | <u>Electrical Units</u> Units of Current and Charge Conventional Current and Electron Flow Direct Current and Alternating Current EMF, Potential Difference & Volts Resistance and Conductance Ohm's Law Efficiency and Power |
| 2 | 2 | <u>Conductors</u> Insulators and Resistors Temperature Effect Conductor Resistivity |
| 3 | 6 | <u>Series Circuits</u> Current in a Series Circuit Voltage Drop in a Series Circuit Voltage Divider Law Power in a series Circuit Open-Circuit and Short-Circuit in a Series Circuit |

ELECTRICAL FUNDAMENTALSELR 100-5

| TOPIC NO. | PERIODS | TOPIC DESCRIPTION |
|-----------|---------------|--|
| | <u>THEORY</u> | |
| 4 | 4 | <u>Parallel Circuit</u> Voltage and Current in a Parallel Circuit Current Divider Law Power in a parallel Circuit Open Circuits and Short Circuits in a Parallel Circuit |
| 5 | 10 | <u>Series-Parallel Circuits</u> Equivalent Series-Parallel Circuit Current in a Series-Parallel Circuit Voltage Drops in a Series-Parallel Circuit |
| 6 | 4 | <u>Network Theorems</u> Superposition Theorem |
| 7 | 5 | <u>Introduction to Magnetism</u> Permanent magnets Electromagnets Hysteresis Eddy Currents |
| 8 | 5 | <u>INDUCTANCE</u> Self-Inductance Mutual Inductance Lenz's Law Inductors in Series & Parallel Energy stored in an Inductor Time Constant |

ELECTRICAL FUNDAMENTALSELR 100-5

| TOPIC NO. | PERIODS | TOPIC DESCRIPTION |
|-----------|---------------|---|
| | <u>THEORY</u> | |
| 9 | 5 | <u>Capacitance</u> Electric Charge Capacitance and Capacitor Dimensions Capacitors in Series and Parallel Energy Stored in Charged Capacitors Time Constant |
| 10 | 10 | <u>Alternating Current and Fundamentals</u> Generation of AC Voltage Frequency and Phase Angle AC Resistive Load Maximum Power Average and RMS Values of Sine Waves Phasors, and complex algebra |
| 11 | 15 | <u>AC Circuits</u> RL, RC and RLC series and parallel circuits Resonance Power factor |