SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: D.C. CIRCUITS & MACHINES

Code No.: ELR 110

Program: MECHANICAL

Semester: 2

Date: JANUARY 7, 1991

Author: RONALD CHARTRAND

New: _____ Revision: ___X___

APPROVED: _____   ___91/01/25___
Chairperson   Date

CALENDAR DESCRIPTION

D.C. CIRCUITS & MACHINES	ELR 110
Course Name	Course Number

PHILOSOPHY/GOALS:

When the student has completed this course he will have a good understanding of the basic fundamentals of DC generator motors and control equipment.

METHOD OF ASSESSMENT (GRADING METHOD):

Students will be assessed by periodic quizzes and tests.

TEXTBOOK(S):

Fundamentals of Electric Circuits - David A. Bell

Electrical Machines and Transformers - Peter F. Ryff-David Platnick-
Joseph A. Karnas

REFERENCE TEXTS:

Industrial Electricity - W. H. Timble

Direct and Alternating Current Machinery - Rosenblatt & Friedman

Maintenance Hints - Westinghouse Corporation

GRADING POLICY - SEPTEMBER 1989

Semester-End Reporting:

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A+  (Numerical Equivalent 4.0) - Consistently Outstanding    90 - 100
A   (Numerical Equivalent 3.75) - Outstanding Achievement     80 -  89
B   (Numerical Equivalent 3.0) - Consistently Above Average
                                              Achievement 65 -  79
C   (Numerical Equivalent 2.0) - Satisfactory or Acceptable
                                              Achievement 55 -  64
R   (Numerical Equivalent 0.0) - Repeat - Objectives of course not
                                  achieved and course must be repeated.
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The following grades are also approved end-of-term grades but are not assigned numerical equivalence for computing the grade point average.

S - Satisfactory (assigned to non-graded courses or field placements).
U - Unsatisfactory (assigned to non-graded courses or field placements when course objectives not achieved).
X - Temporary grade assigned to student for additional time to complete course requirements used ONLY because of extenuating circumstances.
   "X" grade contract form must be completed and submitted for each X grade assigned.

Mid-Term Reporting:

Student progress will be reported as follows for mid-term reports:

S - Satisfactory Progress
U - Unsatisfactory Progress
R - Repeat (objectives have not been met)
NR - Grade not reported to Registrar's Office. This grade is used to facilitate transcript production when faculty, because of extenuating circumstances, find it impossible to report grades by due dates.

D.C. CIRCUITS & MACHINES

TOPIC	PERIODS		TOPIC DESCRIPTION
	THEORY	LABS	
1	10	0	**DC GENERATORS FUNDAMENTALS**

- DC Generator Parts
- Principle of Generator Action
- Faraday's Law-Commutation
- Armature Reaction
- Interpole Action
- Motor Action in Generators
- Solution of Problems using Generator Voltage Equations Torque and Force Equations

2	12	4	**TYPES OF DC GENERATORS**

- Separately Excited Generators
- Equivalent Circuits-Internal Resistance - Saturation Effects & Curve
- Shunt Generator-Operation
- Magnetization Curve, Output, Voltage Build up Characteristics
- Compound Generator - Operations, Magnetization Curve, Output Voltage Build up Characteristics
- Voltage Control Efficiency & Losses
- Solution of Problems Pertaining to DC Generators

3	10	4	**DC MOTORS FUNDAMENTALS**

- DC Motor Parts
- Principle of Motor Action
- Armature Reaction
- Commutation
- Interpole Action
- Counter Electro Motive Force

4	12	6	**DC MOTORS**

- Classifications of DC Motors
- Characteristic of the Different Types of DC Motors
- Speed Regulation and Control
- Electrical Braking of DC Motor
- Efficiency and Ratings
- Applications
- Solution of Problems Pertaining to DC Motor

IF TIME PERMITS

BASIC MECHANICAL ASPECTS OF DC MACHINES

- Introduction to Classifications of Bearings & Lubrication
- Discussion of Shafts & Couplings
- Installation & Alignment

OPTIONAL TOPICS

- Maintenance & Troubleshooting
- Standard Maintenance Requirements for a Preventative Maintenance Program
- Trouble Shooting
- Mechanical Problems Symptoms & Solutions
- Electrical Problems Symptoms & Solutions