SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: ELECTRICAL MACHINES II

Code No.: ELR 208-6

Program: ELECTRICAL ENGINEERING TECHNICIAN

Semester: THREE

Date: JULY 2, 1984

Author: R. PALO

New: _____ Revision: X

APPROVED: L.P. Arsenault
Chairperson

Date

ELECTRICAL MACHINES II	ELR 208-6
COURSE NAME	COURSE NUMBER

PHILOSOPHY/GOALS:

To provide a basic understanding of the characteristics and behaviour of transformers, asynchronous, synchronous and DC machines including control selection.

METHOD OF ASESMENT (GRADING METHOD):

1. Written tests will be conducted at regular intervals.

2. Grading:
   A - 76 to 100%
   B - 66 to 75%
   C - 56 to 65%
   X - 50 to 55%
   R - less than 50%

   70% of course mark is basd on tests.
   30% of course mark is based on lab work.

TEXTBOOK(S):

Electric Machinery & Transformers
by Irving L. Kosow

REFERENCE:

Eelectric Motor Control
by Walter N. Alerich

LECTURE HOURS	TOPIC
8	1) TRANSFORMERS (Kosow Chap. 8) a) functions and types b) construction c) ideal transformer and transformation ratios d) practical transformer e) equivalent circuits f) primary and secondary phasors g) regulation, unity, lagging and leading power factors h) open and short circuit tests i) efficiency j) single and 3 phase winding connections k) polarity and voltage tests l) autotransformer m) instrument transformers n) parallel operation
8	2) Polyphase Induction Motor (Kosow Chap.9) a) construction, squirrel cage and wound rotor b) polyphase rotating magnetic field c) torque production d) slip e) tests, no-load, blocked rotor f) performance, rotor current and power, torque (Max, starting and rated) g) NEMA classifications h) wound rotor characteristics i) speed control, pole changing, variable frequen rotor resistance j) efficiency
4	3) Synchronous Motor (Kosow Chap. 8) a) construction b) starting c) power factor control d) Vee curves e) synchronous capacitor f) efficiency
8	4) AC Motor Control & Application (Alerich - F, G, H, I, J, & L sections) a) across-the-line starters b) reduced voltage starters

LECTURE HOURS	TOPIC
	c) reversing controllers d) wound rotor induction motor starters e) plugging, jogging, braking f) speed control, pole changing, and windings, variable frequency g) shaft power h) speed rating i) frame size j) speed classification k) duty cycle l) temperature m) voltage and current ratings n) enclosures
4	5) DC Motor Characteristics (Kosow Chap. 4) a) torque and power b) torque, development and measurement c) back emf, armature power, equilibrium motor s d) shunt motor e) series motor f) compound motor g) motor starting requirements
6	6) DC Motor Control (Alerich - sections K & L) a) starting, stopping, reversing, speed and norm running requirements b) manual starters and controllers c) magnetic starters and controllers d) reversing techniques e) plugging f) dynamic braking g) regenerative braking h) speed control, armature and field control
2	7) DC Machine Selection a) shaft power b) speed rating c) frame size d) speed classifications e) duty cycle f) ambient temperature g) voltage and current ratings h) enclosures

TOTAL LECTURE HOURS = 40