

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

COURSE OUTLINE

COURSE TITLE: POWER ELECTRONICS
CODE NO.: ELR236 - 6
PROGRAM: ELECTRICAL TECHNICIAN
SEMESTER: FOUR
DATE: JANUARY 1989
AUTHOR: ENO LUDAVICIUS

NEW: REV.: X

APPROVED:

L. P. Crozeth
CHAIRPERSON

90/08/15
DATE

CALENDAR DESCRIPTION

POWER ELECTRONICS
COURSE NAME

ELR236 - 6
COURSE NUMBER

PHILOSOPHY/GOALS:

THE STUDENT WILL BE INTRODUCED TO POWER ELECTRONIC DEVICES WHICH POWER AC & DC DRIVE PACKAGES. THE STUDENT WILL ALSO BE INTRODUCED TO CONVERTER & INVERTER CIRCUITS WHICH COMPRISE THE POWER AND CONTROL FOR THESE DRIVE SYSTEMS. THE STUDENT WILL ACHIEVE HANDS-ON EXPERIENCE OF OPERATIONAL ADJUSTMENT AND TROUBLESHOOTING OF TYPICAL COMMERCIAL AC & DC DRIVE SYSTEMS THROUGH LABWORK.

METHOD OF ASSESSMENT (GRADING METHOD):

THE STUDENT WILL BE ASSESSED IN THE FOLLOWING MANNER:

- 1) THREE WRITTEN TESTS WORTH 20% EACH.
- 2) PROJECTS AND ASSIGNMENTS WORTH 40% IN TOTAL.

TEXTBOOK(S):

- 1) ELECTRICAL POWER TECHNOLOGY - T. WILDI
- 2) POWER ELECTRONICS & CONTROLS - S.K. DATTA
- 3) POWER CONTROL WITH SOLID-STATE DEVICES - I.M. GOTTLIEB
- 4) POWER ELECTRONICS - SOLID STATE MOTOR CONTROL - R.A. PEARMAN
- 5) POWER ELECTRONICS- CIRCUITS, DEVICES, APPLICATIONS- M.H.RASHID
- 6) ELECTRICAL TRANSFORMERS AND POWER EQUIPMENT - A.J. PANSINI
- 7) ELECTRICAL POWER SYSTEM TECHNOLOGY - S.W.FARDO & D.R.PATRICK

POWER ELECTRONICS

GENERAL OBJECTIVES

1) BLOCK 1 - INTRODUCTION TO POWER ELECTRONICS

- 1.1) INTRODUCTION TO THE POWER ELECTRONICS INDUSTRY
- 1.2) POWER ELECTRONIC DEVICES: POWER SEMICONDUCTOR DIODES
- 1.3) POWER ELECTRONIC DEVICES: POWER TRANSISTORS
- 1.4) POWER ELECTRONIC DEVICES: THYRISTORS

2) BLOCK 2 - DIODE CIRCUITS & RECTIFIERS & CONTROLLED RECTIFIERS

- 2.1) THYRISTOR COMMUTATION TECHNIQUES
- 2.2) SINGLE & THREE PHASE DIODE CIRCUITS
- 2.3) PHASE CONTROLLED CONVERTERS
- 2.4) STATIC SWITCHES

3) BLOCK 3 - DC CHOPPERS & DC DRIVES

- 3.1) INTRODUCTION TO STEP-UP & STEP-DOWN CHOPPER OPERATION
- 3.2) THYRISTOR CHOPPER CIRCUITS
- 3.3) INTRODUCTION TO SINGLE & THREE PHASE DRIVES
- 3.4) INTRODUCTION TO CHOPPER DRIVES

4) BLOCK 4 - AC VOLTAGE CONTROLLERS & INVERTERS

- 4.1) INTRODUCTION TO SINGLE & THREE PHASE CONTROLLERS
- 4.2) INTRODUCTION TO CYCLOCONVERTERS
- 4.3) INTRODUCTION TO SINGLE & THREE PHASE INVERTERS
- 4.4) INTRODUCTION TO THE DIFFERENT TYPES OF INVERTER CONTROL