

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

#221

COURSE OUTLINE

Course Title: POWER ELECTRONICS

Code No.: ELR 317-3

Program: ELECTRICAL TECHNOLOGY

Semester: FIVE

Date: 1986

Author: _____

New: _____ Revision: _____

APPROVED: *R.P. Crozetta*
Chairperson

86/09/20
Date

POWER ELECTRONICS

ELR 317-3

Course Name

Course Number

PHILOSOPHY/GOALS:

To reinforce the previous studies in Power Electronics.

METHOD OF ASSESSMENT (GRADING METHOD):

Approximately 4 tests will be given. Quizzes may be given without notice.

| | |
|---|---------------|
| A | 80 - 100% |
| B | 66 - 79% |
| C | 55 - 65% |
| R | less than 50% |

3

Harmonics and Power Factor

Harmonics in converters

Harmonics on ac side

Harmonics on dc side

Disadvantages of harmonics

Disadvantages of reactive power

Reducing ac harmonics

Reducing dc harmonics

Power factor

Power factor improvement

Cascade connection

Static compensators

Capacitor compensation

Switched capacitors

Fixed capacitor and controlled reactor

Switched capacitor and controlled reactor

Fixed capacitor and saturable reactor

3

DC Motor Control

Shunt motor characteristics

Armature voltage control

Field control

Armature and field control

Series motor control

6

Controllers

Types

Choice of controller

Control system optimization

Linear optimization

Square optimization

Amplitude optimization

Absolute Value optimization

Symmetrical optimization

12

AC Motor Control

Frequency control

Slip control

Constant torque operation

Constant power operation

Voltage source inverter

Current source inverter

Stator voltage control

Slip power recovery

Pulse width modulation

Cycloconverters

Comparison between ac and dc drives

Faults and Protection

Overvoltage

Protection against overvoltage

Overcurrent

Fast acting semiconductor fuses

Ground faults