SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: __FUNDAMENTALS OF ELECTRONICS__

Code No.: __ELN 112__

Program: __COMPUTER ENGINEERING TECHNOLOGY__

Semester: __TWO__

Date: __JANUARY, 1987__

Author: __W. FILIPOWICH__

New: _____ Revision: _____

APPROVED: _____ _____
          Chairperson   Date

COURSE OUTLINE

FUNDAMENTALS OF ELECTRONICS

ELN 112-5

BLOCK I - Electronic Devices & Amplifiers

A) Transistor (BJT) Amplifiers

    1. Multi-stage Amplifiers
       -AC/DC Analysis
    2. Direct Coupled Amps
    3. Power Amps

B) Operational Amplifiers (OPAMPS)

    1. Differential Amp
    2. Symbol Diagram, Operation and Characteristics
    3. OPAMP Circuits
       -Inverting Amp
       -Non-Inverting Amp
       -Comparator
       -Adder/Subtractor
       -I/V, V/I Convertors
       -A/D, D/A Convertors

C) Field Effect Transistors

    1. JFET
       -symbol, characteristics, operation
       -JFET Amplifiers
    2. MOSFET's
       -symbol, characteristics, operation and
        applications

FUNDAMENTALS OF ELECTRONICS	ELN 112-5
Course Name	Course Number

PHILOSOPHY/GOALS:

This course is intended to provide the student with a solid background in electronic analog devices, circuits and their applications.

The course will cover audio amplifiers, switching and pulse circuits, industrial control circuits that the computer may interface with.

The practical work will further develop the student's design, testing and troubleshooting skills using various test equipment.

METHOD OF ASSESSMENT (GRADING METHOD):

1. Testing in relation to the theory objectives will make up approximately 60% of the final mark and will consist of at least three major tests plus short quizzes.

2. Testing in relation to the practical (lab) objectives will make up approximately 40% of the final mark and will consist of practical troubleshooting tests, lab reports and practical assessments, which will include lab attendance, participation, performance, attitude, etc.

TEXTBOOK(S):

Reference material will be referred to throughout the course.

1. Ideal Pulse
2. RC Waveshaping Circuits
   -Integrator
   -Differentiator

B) Switching and Signal Conditioning Circuits

1. Diode & Transistor Switches
2. Clippers and Limiters
3. Schmitt Trigger

C) Pulse/Sweep Generating Circuits

1. VJT Oscillator
2. Multivibrators
3. Sweep Generators

BLOCK III - Industrial Electronics

A) Timing, Relay and Digital Circuits

1. RC time delay circuits
2. Relay operation and SSR's
3. Relay, solid-state and digital logic circuits
4. Operation, application, testing, analysis and troubleshooting of industrial control circuits.

B) Optoelectronics

1. Photoelectric Devices
    -photovoltaic cell
    -photoconductor
    -photoemissive tube
2. Photoconductive Sensors
    -photo diode
    -photo transistors
    -photo IC's
3. Light - emitters - LED's, LCD's
4. Photocouplers
5. Fibre optics
6. Application of optoelectronic devices in industrial control

C) Solid State Trigger Devices

1. Operation, characteristics, specifications, testing and applicatoin
    -four layer diode
    -unijunction transistor (UJT)
    -DIAC
2. UJT relaxation oscillator
3. The 555 timer - operation and application

D) Thyristor (PNPN) Control Devices

1. Latching devices
2. Silicon controlled rectifier (SCR)
    -theory and operation
    -gate charcteristics and control circuits
    -AC/DC load control (Half & Full Wave)
    -UJT/SCR control circuits
3. Triacs
    -theory, operation, characteristics and application
4. Other thyristor devices
    -LASCR, GCS, SCS, GTO
5. DC motor speed control systems