SAULT COLLEGE

of Applied Arts and Technology

Sault Ste. Marie

COURSE OUTLINE

INDUSTRIAL ELECTRONICS

ELN-213-4

revised April, 1981 by W. Filipowich

INDUSTRIAL ELECTRONICS
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COURSE OUTLINE

BLOCK NUMBER	PERIODS T-L	TOPIC DESCRIPTION	REFERENCE
A.	4-4	**Transistor Switching, Timing Circuits and Relays** 1. Transistor as a Switch 2. Transistor Switching Circuits 3. RC Time Delay Circuits 4. Relay Construction, Functions and Operations 5. Applications of Transistor Switches, Time-Delay Circuits and Relays in Control Circuits	Electronic Principles Malvino Industrial Solid-State Electronics, Maloney
B.	4-6	**Optoelectronics** 1. Fundamentals of Light 2. Photoelectric Devices - photovoltaic cell - photoconductor - photoemissive tube 3. Photoconductive Sensors - photo diode - photo transistors - photo IC's 4. Light - Emitters - LED's 　　　　　　　　　- IRED's 　　　　　　　　　- LASERS 　　　　　　　　　- LCD's 　　　　　　　　　- Nixie Tubes 　　　　　　　　　- Alphanumeric Displays 5. Photocouplers 6. Fibre Optics 7. Application of Optoelectronic Devices in Industrial Control	
C.	4-6	**Operational Amplifiers** 1. Introduction to Differential Amplifiers 　- symbol 　- circuit diagram 　- modes of operation 2. OPAMPS - Construction, operation, characteristics and specifications 3. OPAMP Circuits - operation, voltage gain 　- amplifiers 　- comparators 　- inverters and non-inverters 　- adders and subtractors 　- integrators and differentiators 　- converters (voltage/current) 4. Applications of OPAMPS in Control Circuits	

BLOCK NUMBER	PERIODS T-L	TOPIC DESCRIPTION	REFERENCE
D.	2-3	**Unijunction Transistors**	

1. Operation, Characteristics, Specifications and Ratings of UJT's
2. UJT Relaxation Oscillator
3. UJT Timing Circuits and Triggering Devices
4. CUJT and PUT Devices
5. UJT Applications

| E. | 14-21 | **PNPN (Thyristor) Devices** | |

1. Introduction
2. PNPN Trigger Devices - symbol, operation, I-V curve, characteristics and applications
   (a) Schockley (Four-Layer Diode
   (b) SUS
   (c) DIAC
   (d) SBS
3. Silicon Controlled Rectifiers (SCR's)
   - theory and operation
   - I-V anode and gate characteristics
   - SCR gate control circuits
   - AC and DC Switching Circuits
   - SCR Connections to Loads
   - SCR Applications
        - phase control circuits
        - motor-speed control
        - alarm and lighting systems
4. Triacs - theory and operation
        - electrical characteristics
        - triggering methods
        - applications in controls
5. LASCR