

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: ELECTRONIC FUNDAMENTALS I  
Code No.: ELN100-6  
Program: ELECTRICAL/ELECTRONICS/COMPUTER ENG. TECH./TECHN'Y  
Semester: ONE  
Date: JUNE, 1984  
Author: W. FILIPOWICH

New: \_\_\_\_\_ Revision: X

APPROVED:

*J.P. Crozitto*  
Chairperson

\_\_\_\_\_  
Date

ELECTRONIC FUNDAMENTALS I  
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PHILOSOPHY/GOALS:

This course, along with Electronic Fundamentals II (ELN101), is planned to meet the needs of the technician/technologist who is to work in the electrical/electronic field. It is intended to provide a solid background in fundamentals that is necessary for the study of the more specialized aspects of electronics. The student will become familiar with solid-state devices (diodes and transistors), their characteristics and applications in power supply and basic amplifier circuits. The student will be able to analyze, construct, test and troubleshoot various circuits using theoretical and practical methods.

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 two major tests plus various short quizzes.
2. Testing in relation to the practical (lab) objectives will make up approximately 40% of the final mark and will consist of a formal power supply technical report, lab logbook reports and practical assessments which will include lab attendance, participation, performance, attitude, etc.

TEXTBOOK(S):

ELECTRONIC PRINCIPLES - 3rd Ed.; Malvino (McGraw-Hill)

REFERENCES:

- FUNDAMENTALS OF ELECTRONICS - 3rd Ed. Lurch (Wiley)
- GENERAL ELECTRONIC CIRCUITS - 2nd Ed.; DeFrance (Holt-Rinehart)
- FUNDAMENTALS OF ELECTRONIC DEVICES - 2nd Ed.; Tocci (Merrill)
- ELECTRONIC DEVICES AND CIRCUITS - 3rd Ed.; Boylestad/Nashelsky (Prentice-Hall)

COURSE OBJECTIVES:

At the successful completion of this course, students should meet these General Objectives:

1. Students should have obtained sufficient atomic theory to cope with the understanding of electronic devices and the fundamentals of electrical behavior.
2. Students should be familiar with the theory of operation of the following devices: -p-n diode, zener diode, junction transistor.
3. Students should be able to do DC analysis of circuits using devices in 2.
4. Students should be able to test devices in 2.
5. Students should be able to analyze DC power supply circuits.
6. Students should be able to analyze DC transistor amplifier circuits.
7. Students should be able to construct, analyze, test and troubleshoot various power supply circuits and transistor amplifier circuits using various test equipment.

- Zener Voltage Regulator  
- Zener Diode Characteristics  
- Voltage Multipliers  
- Diode Ratings  
- Filter Networks  
- Characteristics  
- Rectifier Circuits

- CC and CB Amplifier Analysis  
- Amplifier Voltage Gain  
- Input and Output Impedance  
- Cascaded Amplifiers  
- Amplifier Troubleshooting  
- CE Amplifier AC Analysis  
- Transistor Ratings and Specifications  
- Transistor Biasing Methods  
- Transistor Amplifier Configurations  
- Regions of Operation  
- NPN/PNP Transistor Characteristics

TEXT: Electronic Principles, 3rd Ed., Malvino

<u>BLOCK</u>	<u>PERIOD T-L</u>	<u>TOPIC DESCRIPTION</u>	<u>REFERENCE</u>
I	8 - 6	<u>Semiconductor Diodes</u> <ul style="list-style-type: none"><li>- Introduction to Current Flow</li><li>- Review of Basic Theorems</li><li>- Semiconductor Theory</li><li>- Energy Levels</li><li>- Doping</li><li>- PN Diode Formation</li><li>- Diode Biasing Methods</li><li>- Diode Circuit Analysis<ul style="list-style-type: none"><li>- approximate method</li><li>- load lines</li></ul></li></ul>	Chapters 1, 2
II	14 - 15	<u>DC Power Supplies.</u> <ul style="list-style-type: none"><li>- Block Diagram</li><li>- Sine Wave Analysis</li><li>- Power Transformers</li><li>- Rectifier Circuits and Characteristics</li><li>- Filter Networks</li><li>- Diode Ratings</li><li>- Voltage Multipliers</li><li>- Zener Diode Characteristics</li><li>- Zener Voltage Regulator</li></ul>	Chapters 3, 4
III	26 - 24	<u>Transistor (BJT) Amplifier</u> <ul style="list-style-type: none"><li>- NPN/PNP Transistor Characteristics</li><li>- Regions of Operation</li><li>- Transistor Biasing Methods</li><li>- Transistor Amplifier Configurations and DC Circuit Analysis</li><li>- Transistor Ratings and Specifications</li><li>- CE Amplifier AC Analysis</li><li>- Amplifier Troubleshooting</li><li>- Cascaded Amplifiers</li><li>- Input and Output Impedance</li><li>- Amplifier Voltage Gain</li><li>- CC and CB Amplifier Analysis</li></ul>	Chapters 5, 6, 7, 8, 9