

DOC # 28

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: ELECTRONIC CIRCUITS

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CODE NO.: ELN109-5

SEMESTER: 2

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PROGRAM: ELECTRICAL/ELECTRONIC TECHNICIAN/TECHNOLOGY

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AUTHOR: W. FILIPOWICH

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DATE: DEC. 15, 1991

PREVIOUS OUTLINE DATED: NOV. 1987

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APPROVED: \_\_\_\_\_

DEAN

*L. P. Crozette*

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DATE

*02/01/02*



ELECTRONIC CIRCUITS  
COURSE NAME

ELN109-5  
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TOTAL CREDIT HOURS 5

PREREQUISITE(S): ELN100-6 ELECTRONIC FUNDAMENTALS

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**I. PHILOSOPHY/GOALS:**

This course is intended to provide a solid background in fundamentals that is necessary for the study of more specialized aspects of electronics. The student will expand his knowledge gained in Electronic Fundamentals 1 (ELN100) with the continuation of amplifier analysis. Theoretical and practical analysis of voltage and power amplifiers, including equivalent circuits, coupling methods, classes of operation, will be covered as well as BJT, JFET, MOSFET and OPAMP devices. Related lab work with emphasis on testing, troubleshooting and circuit analysis.

**II. STUDENT PERFORMANCE OBJECTIVES:**

Upon successful completion of this course the student will:

- 1) become familiar with solid state devices such as BJT's, FET's and OPAMPS.
- 2) be able to analyze, construct, test and troubleshoot various amplifier circuits using theoretical and practical methods, using various test equipment.

**III. TOPICS TO BE COVERED:**

- 1) Small-signal (voltage) amplifiers
- 2) Cascaded and power amplifiers
- 3) Field effect transistors (FET's)
- 4) Operational amplifiers
- 5) Introduction to an AM receiver

IV. LEARNING ACTIVITIES

a) Small-signal Transistor Amplifiers

1. Review

b) Cascaded and Power Amplifiers

1. Amplifier Coupling Methods
2. Analysis of Direct Coupled Amplifiers
3. Classes of Operation
4. Power and Efficiency Calculations
5. AC Analysis of Class A and Class B Power Amplifiers
6. h Parameters
7. Decibels and Power Gain
8. Frequency Effects

c) Field Effect Transistors

1. Principles of Operation of JFET and MOSFET
2. Characteristic curves and parameters
3. Biasing Techniques
4. Common-Source and Common-Drain Circuit Analysis
5. Fet applications

d) Operational Amplifiers

1. Differential Amplifier - operation and Analysis
2. Operational Amplifier
  - operation
  - characteristics
  - parameters
  - linear inverting and non-inverting amplifiers
  - band width
3. Feedback

e) AM Receiver

1. Block Diagram
2. Circuit Operation and Waveform Analysis

REQUIRED RESOURCES

Text - Paynter  
Chapter 7, 8

Chapter 9

Chapters 10, 11

Chapters 12, 13, 14

- 3. Alignment
- 4. Troubleshooting

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V. **EVALUATION METHODS: (INCLUDES ASSIGNMENTS,  
ATTENDANCE REQUIREMENTS, ETC.)**

Assessments will consist of major tests and quizzes for approximately 65% of the overall mark.

Practical tests, lab quizzes, lab book and general lab assessment will make up approximately 35% of the overall mark.  
**(LAB ATTENDANCE IS COMPULSORY)**

The student must successfully pass both portions to achieve a passing grade.

The following grades will be assigned to students in post-secondary programs:

- A+ Consistently outstanding (90%)
- A Outstanding achievement (80% to 89%)
- B Consistently above average achievement (66% to 79%)
- C Satisfactory or acceptable achievement in all areas subject to assessment (55% to 65%)
- R Repeat -- the student has not achieved the objectives of the course and the course must be repeated
- X A temporary grade, limited to situations with extenuating circumstances, giving a student additional time to complete course requirements

VI. **REQUIRED STUDENT RESOURCES**

- 1) Text - Introductory Electronic Devices and Circuits (2nd ed) by Paynter (Prentice-Hall)
- 2) Lab Manual - Paynter
- 3) Protoboard, tools and supplies as required

VII. **SPECIAL NOTES**

Students with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Our instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.