SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON

COURSE OUTLINE

Course Title: NETWORK ANALYSIS

Code No.: ELR309 Semester: 5

Program: ELECTRICAL/ELECTRONICS ENG. TECHNOLOGY

Author: Doug Faggetter

Date: Sept. 1999 Previous Outline Date: April 1998

Approved: _____ _____
Dean Date

Total Credits: 8 Prerequisite(s): ELR109, MTH551
Length of Course: 16 Total Credit Hours: 128

I. COURSE DESCRIPTION:

An in-depth study of electric circuits using network theorems, differential equations and Laplace transforms.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course the student will demonstrate the ability to:

1) Analyze a resistive circuit using Nodal analysis and Mesh analysis.

Potential Elements of the Performance:
- Using a matrix solution of the network equations, determine the voltage and current in the elements of a resistive circuit.

2) Analyze a First-Order circuit.

Potential Elements of the Performance:
- Write and solve a differential equation for a network with resistors and a capacitor.
- Write and solve a differential equation for a network with resistors and an inductor.

3) Analyze a Second-Order circuit using differential equations.

Potential Elements of the Performance:
- Write and solve a differential equation for a Second-Order circuit with resistors, inductors and capacitors.
- Solve the differential equation for a Second-Order circuit with excitation by initial conditions, excitation by a source and excitation by initial conditions and a source.
- Write complementary, particular and complete solutions.
- Solve for the under-damped case, critically-damped case and over-damped case.

4) Analyze a First-Order circuit using Laplace transforms.

Potential Elements of the Performance:
- Define the Laplace transform.
- Analyze a circuit with a transformed network if excited by only initial conditions.
- Analyze a circuit by transforming the differential equation if the circuit is excited by a source.

III. TOPICS:

1) Basic Circuit Laws

2) Resistive Networks

3) Capacitors and Inductors

4) First-Order Circuit Analysis

5) Second-Order Circuit Analysis

6) Laplace Transform Circuit Analysis

IV. REQUIRED RESOURCES/TEXTS/ MATERIALS:

Course Notes Package

V. EVALUATION PROCESS/GRADING SYSTEM

The grading weight will be:
Theory 100%

The grading system will be as follows:

A+	90% - 100%	Outstanding Achievement
A	80% - 89%	Above Average Achievement
B	70% - 79%	Average Achievement
C	60% - 69%	Satisfactory Achievement
R	below 60%	Repeat

VI. SPECIAL NOTES:

- Special Needs
  If you are a student with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717, 491 so that support services can be arranged for you.

- Retention of Course Outlines
  It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions.

- Substitute Course Information is available at the Registrar’s Office.

VII. PRIOR LEARNING ASSESSMENT

Students who wish to apply for advanced credit in the course should consult the instructor.