COURSE INFORMATION FORM

DISCIPLINE: ETEC
COURSE TITLE: AC Circuit Analysis

CR.HR  4  LECT HR.  3  LAB HR.  2  CLIN/INTERN HR.  CLOCK HR.

CATALOG DESCRIPTION

This course covers AC circuits, complex numbers, inductance, capacitance, RL and RC circuits, RC time constants and transients, resonance, transformers, relays and switches. Introduction to Solid State Principles and filters as they relate to electrical and electronic power supplies.

PREREQUISITES

MATH 130 or higher or concurrent enrollment

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)

Upon completion of this course, the student will be able to:

1. Identify an AC circuit
2. Calculate resistance in an AC circuit
3. Determine inductor values
4. Analyze RL series and parallel circuits
5. Determine capacitance values
6. Analyze RC series and parallel circuits
7. Calculate RC time constants
8. Identify RC circuit transients
9. Analyze RLC series and parallel circuits
10. Determine resonance in series and parallel circuits
11. Demonstrate an understanding of transformer operation
12. Describe the operation and significant differences between DC and AC of relays and switches
13. Demonstrate electrical safety precautions
14. Demonstrate an understanding of complex numbers
15. Describe the operation of magnetic amplifiers with the application of DC and AC in the same transformer core
16. Explain solid state power supply operation
GENERAL EDUCATION OUTCOMES (ESO)
Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

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<th>Outcomes</th>
<th>ESO</th>
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PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

The student will demonstrate:

1. the ability to apply foundational skills in an engineering technology setting, safely and to industry guidelines.
2. the ability to think critically and apply problem solving skills.
3. the ability to exhibit competence in entry level skills of technical profession in engineering technology.

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes may be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

Quizzes (1-16)
Practice Exercises (1-12, 14)
Lab Experiments (3-12)
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Alternating Current and Voltage
   a. Advantages to using AC
   b. AC Waveforms, characteristics and calculations

II. AC Test Equipment
   a. Scope meters
   b. Meggers

III. Inductance and RL Circuits
    a. Inductors
    b. RL series circuits
    c. RL parallel circuits

IV. Capacitance and RC Circuits
    a. Capacitors
    b. RC series circuits
    c. RC parallel circuits

V. Resistive-Inductive-Capacitive Circuits
   a. RLC series circuits
   b. RLC parallel circuits
   c. Filters

VI. Resonance
    a. Capacitive/Inductive and LCR
    b. RLC Series and Parallel Circuits
    c. Series Resonance
    d. Parallel Resonance

VII. Transformers
    a. Single Phase
    b. Three Phase

VIII. Relays and Switches
    a. Introduction to Solid-State Principles PN Junction
IX. Power Supply Principles including
a. Transformation,
b. Rectification and Filtering