JEFFERSON COLLEGE
COURSE SYLLABUS

ETC104
AC Circuits
5 Credit Hours

Prepared By: John McDaniel
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ETC104 AC Circuits

I. CATALOGUE DESCRIPTION

A. Prerequisite: ETC103 DC Circuits

B. Credit Hour Award: 5

C. AC Circuits is a study of time constants, alternating current theory, waveform parameters, reactive components, circuit analysis techniques, transformers, resonance, filters, and equipment and procedures common to the analysis of AC circuits. (F,D)

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

<table>
<thead>
<tr>
<th>Demonstrate knowledge and understanding of the concepts and laws related to the study of magnetism, electromagnetism, inductance, capacitance, and time constants</th>
<th>Evaluate by written exams, quizzes and observation of lab performance</th>
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<tr>
<td>Demonstrate knowledge and understanding of the concepts and laws related to the study of voltage, current, impedance, and power in AC circuits</td>
<td>Evaluate by written exams, quizzes and observation of lab performance</td>
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<td>Demonstrate ability to identify and schematically represent common AC components and circuits</td>
<td>Evaluate by written exams, quizzes and observation of lab performance</td>
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<td>Demonstrate skill in constructing series, parallel, and complex series/parallel AC circuits from a schematic diagram.</td>
<td>Evaluate by observation of lab performance</td>
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<td>Demonstrate knowledge and skill in the use of test equipment commonly associated with AC circuit analysis</td>
<td>Evaluate by written exams, quizzes and observation of lab performance</td>
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<td>Demonstrate ability to successfully analyze and troubleshoot AC components and circuits</td>
<td>Evaluate by written exams, quizzes and observation of lab performance</td>
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III. OUTLINE OF TOPICS

A. Unit 1 - Introduction to AC Circuits
   1. Alternating Current
   2. Generating AC Electricity
3. Non-Sinusoidal Waves
4. Resistance in AC circuits
5. Introduction to AC post-test (theory)

B. Unit 2 – AC Test Equipment Introduction to Oscilloscopes
   1. Oscilloscope use
   2. Oscilloscope use with function generator
   3. Introduction to the function generator
   4. Function generator use

C. Unit 3 – Induction and RL Circuits
   1. Introduction to inductors
   2. Inductor identification RL series circuits
   3. RL series circuit operation
   4. RL parallel circuits
   5. RL parallel circuit operation
   6. RL filters

D. Unit 4 – Capacitance and RC Circuits
   1. Introduction to capacitors
   2. Capacitor identification RC series circuits
   3. RC series circuit operation
   4. RC parallel circuits
   5. RC parallel circuit operation
   6. RC filters

E. Unit 5 – RC Time Constants and Transients
   1. RC and RL time constants
   2. RC time constants operation
   3. RC circuit transient analysis

F. Unit 6 - Resonance
   1. Capacitive/inductive reactance and LCR circuits
   2. Series resonance
   3. Series resonant circuits
   4. Parallel resonance
   5. Parallel resonant circuits

IV. METHOD(S) OF INSTRUCTION

A. NIDA Electronics Training Software

B. Lab Exercises

C. Class Lecture
V. REQUIRED TEXTBOOK(S)


VI. REQUIRED MATERIALS

A. Paper
B. Pens
C. Pencils
D. Scientific Calculator

VII. SUPPLEMENTAL REFERENCES

Class Handouts

VIII. METHODS OF EVALUATION

A. Attendance
B. Exams
C. Lab Exercises
D. Homework

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-797-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website http://www.jeffco.edu).
XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.