



**Purpose:** It is the intention of this Administrative-Master Syllabus to provide a general description of the course, outline the required elements of the course and to lay the foundation for course assessment for the improvement of student learning, as specified by the faculty of Wharton County Junior College, regardless of who teaches the course, the timeframe by which it is instructed, or the instructional method by which the course is delivered. It is not intended to restrict the manner by which an individual faculty member teaches the course but to be an administrative tool to aid in the improvement of instruction.

**Course Title -** A.C. Circuits

**Course Prefix and Number -** CETT 1405

**Department –** Electronics Eng. Tech.

**Division -** Technology and Business

**Course Type:** (check one)

- Academic General Education Course (from ACGM – but not in WCJC Core)
- Academic WCJC Core Course
- WECM course (This course is a Special Topics or Unique Needs Course: Y  or N )

**Semester Credit Hours # : Lecture hours # : Lab/Other Hours #**    **4:3:3**

**Equated Pay hours for course –** 4.5

**Course Catalog Description -** A study of the fundamentals of alternating current including series and parallel AC circuits, phasors, capacitive and inductive networks, transformers, and resonance. Sinusoidal steady state circuit analysis using complex numbers, inductance, capacitance, RL and RC time constants, transformers, resonance, filters, and frequency response. Laboratory realization of lecture topics.

List Lab/ Other Hours
Lab Hours 3
Clinical Hours
Practicum Hours
Other (list)

**Prerequisites/Co Requisites -** CETT 1403 and credit for or concurrent enrollment in MATH 1316

**Prepared by** David Kucera

**Date** 05/20/15

**Reviewed by Department Head** David Kucera

**Date** 05/20/15

**Accuracy verified by Division Chair** David Kucera

**Date** 05/20/15

**Approved by Dean or Vice President of Instruction** Leigh Ann Collins

**Date** 12/3/15



**I. Topical Outline** – Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, clinical or other non-lecture instruction):

The following performance will be expected of any student completing this course with a passing grade. There is no absolute time limit on the performance of these objectives, unless noted, but the grade received by the student will depend, in part, on the relative speed and precision of the student's performance in these tasks. Where subjective evaluations are indicated, the instructor will make these judgments based on his or her knowledge of the skills required to place a graduate with the expectation of successful on-job performance.

The student will be expected to perform the following tasks in written examination or laboratory demonstration:

- Recall the names and units associated with the sine wave.
- Write the instantaneous equation of AC voltage and current for a resistive, inductive, and capacitive load.
- Compute the effective values of periodic wave forms.
- Explain the lack of power dissipation by reactive components.
- Compute the inductive and capacitive reactance of various inductors and capacitors operating at various frequencies.
- Determine the effective and average values of various waveforms.
- Compute the average power dissipated by a resistive load.
- Write complex numbers in both rectangular and polar form.
- Transform complex number forms between rectangular and polar.
- Perform arithmetic operations with complex numbers
- Determine quality factor and bandwidth for series and parallel resonant circuits.
- Differentiate between the characteristics of series and parallel resonant circuits.
- Analyze AC complex impedance circuits utilizing network analysis techniques.
- Differentiate between band pass and band stop filters.
- Examine the pulse response of RC and RL circuits.

**II. Course Learning Outcomes**

<b>Course Learning Outcome</b>	<b>Methods of Assessment</b>
<p><b>Upon successful completion of this course, students will:</b></p> <ul style="list-style-type: none"> <li>• 1. Operate test equipment.</li> <li>• 2. Identify various sources of electricity in AC circuits</li> <li>• 3. Analyze AC circuits using appropriate mathematical formulas.</li> <li>• 4. Troubleshoot various AC circuits using schematic diagrams.</li> <li>• 5. Apply and interpret basic principles of magnetism</li> </ul>	<p><b>Outcomes 1,2,3,4,5 will be assessed by:</b></p> <ul style="list-style-type: none"> <li>• Exams</li> <li>• Homework</li> <li>• Labs</li> <li>• Quizzes</li> <li>• Reassessed in Capstone Experience: CETT 2349 Final Project course</li> </ul>

**III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.**

An appropriate electronics text covering A.C. circuits. Example-Electronics Principles by Floyd 9<sup>th</sup> edition.

Calculator – scientific with Sine, Cosine, Tangent capabilities..

**IV. Suggested Course Maximum – 30 Lecture 15 laboratory**

**V. List any specific spatial or physical requirements beyond a typical classroom required to teach the course.**

Lecture facilities for 30 students. Laboratory facilities for 18 students must include 9 bench positions each with a digital meter, logic probe, 20 MHz oscilloscope and probes, bread boarding facility with power supply and signal generator, and a stock of basic AC circuit components.

**VI. Course Requirements/Grading System – Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course**

Evaluation of Performance:

Course grades will be determined by the percentage of course objectives for which the student can demonstrate mastery and by attendance as stated in the Departmental Policy sheet provided to the student. Mastery of course objectives will be determined by written examinations, an attendance grade as described in the Departmental Policy handout, a daily work grade which will include graded homework, graded laboratory work, and a comprehensive final exam.

Approximate Grade Evaluation Summary:

Major tests	60%
Attendance	10%
Lab reports, homework, and quizzes	15%
Comprehensive Final examination	15%

**Grade Scale:**

90 to 100:	A
80 to 89:	B
70 to 79:	C
60 to 69:	D
0 to 59:	F

**VII. Curriculum Checklist**

- **Academic General Education Course** (from ACGM – but not in WCJC Core)  
No additional documentation needed

- **Academic WCJC Core Course**  
Attach the Core Curriculum Checklist, including the following:

- Basic Intellectual Competencies
- Perspectives
- Exemplary Educational Objectives

- **WECM Courses**  
If needed, revise the Program SCANS Matrix & Competencies Checklist.