



**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 Technology

**Division** – Bus. and Technology

**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** –  $3+(3*1/2) = 4.5$

**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/Corequisites** - Credit for CETT 1403, concurrent enrollment or credit for MATH 1316

**Approvals** – the contents of this document have been reviewed and are found to be accurate.

Prepared by <i>David Keeton</i>	Signature <i>[Signature]</i>	Date 9-24-07
Department Head <i>David Keeton</i>	Signature <i>[Signature]</i>	Date 9-24-07
Division Chair	Signature <i>Stephanie Dees</i>	Date 11/8/07
Vice President <i>Dr. Ty Pate</i>	Signature <i>Ty Pate</i>	Date 11/12/07



**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 bandpass and bandstop filters.
- Examine the pulse response of RC and RL circuits.

**II. Course Learning Outcomes**

<b>Course Learning Outcome</b>	<b>Method of Assessment</b>
Demonstrate appropriate use of test equipment.  Identify various sources of electricity in AC circuits; analyze AC circuits using appropriate mathematical formulas.  Troubleshoot various AC circuits using schematic diagrams.  Apply and interpret basic principles of magnetism	Assessed in Capstone Experience: ELMT 2330 Final Project course.

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

An appropriate electronics text covering A.C. circuits. Example-Foundation of Electronics by Meade 4th 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, breadboarding 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, physical soldering exams, 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%

**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**  
Attach the following:

- Program SCANS Matrix
- Course SCANS Competencies Checklist

Program: Electronics Technology								Credential: AAS Degree	
LIST OF ALL COURSES REQUIRED AND IDENTIFIED COMPETENCIES									
Competencies								Course Number	Course Title
1	2	3	4	5	6	7	8		
X			X	X	X	X	X	CETT 1321	Electronic Fabrication
X	X	X	X	X	X	X	X	CETT 1403	D. C. Circuits
X	X	X	X	X	X	X	X	CETT 1425	Digital Fundamentals
X	X	X	X	X	X	X	X	CETT 1405	A. C. Circuits
X	X	X	X	X	X	X	X	CETT 1449	Digital Systems
X	X	X	X	X	X	X	X	CETT 1331	Technical Programming
X		X	X	X	X	X	X	CETT 1341	Solid State Circuits
X	X	X	X	X	X	X	X	CETT 1445	Microprocessors
X	X	X	X	X	X	X	X	CETT 1457	Linear Integrated Circuits
X	X	X	X	X	X	X	X	EECT 2439	Communication Circuits
X	X	X	X	X	X	X	X	ELMT 1301	Programmable Logic Controllers
X	X	X	X	X	X	X	X	ELMT 2330	Final Project
X		X	X	X	X	X	X	ELMT 2433	Industrial Electronics
X	X	X	X	X	X	X	X	EECT 1303	Introduction to Telecommunications
X	X		X	X	X			ENGL 1301	English
X		X	X	X	X			MATH 1314	College Algebra
X	X		X	X	X			ENGL 2311	Technical Report Writing
X		X	X	X	X			Math 1316	Trigonometry
X			x	x	x			Elective	Social Behavioral Science
X			X	X	X			Elective	Humanities/Fine Arts
								<b>COMPETENCY REFERENCES</b>	
								8 B BASIC USE OF COMPUTERS	
								7 B WORKPLACE COMPETENCIES	
								6 B PERSONAL QUALITIES	
								5 B THINKING SKILLS	
								4 B SPEAKING AND LISTENING	
								3 B ARITHMETIC OR MATHEMATICS	
								2 B WRITING	
1 B READING									