

Administrative Master Syllabus

Course Information

Course Title	AC Circuits
Course Prefix, Num. and Title	CETT 1405 – AC Circuits
Division	Technology and Business
Department	Electronics Engineering Technology
Course Type	WECM Course
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.
Pre-Requisites	CETT 1403
Co-Requisites	None

Semester Credit Hours

Total Semester Credit Hours (SCH): Lecture Hours: Lab/Other Hours	4:3:3
Equated Pay Hours	4.5
Lab/Other Hours Breakdown: Lab Hours	3
Lab/Other Hours Breakdown: Clinical Hours	0
Lab/Other Hours Breakdown: Practicum Hours	0
Other Hours Breakdown	0

Approval Signatures

Title	Signature	Date
Department Head:	David Kucera, Electronics Engineering Technology Program Director	10-26-2023
Division Chair:	David Kucera, Technology & Business Division Chair	10-26-2023
VPI:		

Additional Course Information

Topical Outline: Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and 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 show understanding of the following 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.

Course Learning Outcomes:

Learning Outcomes – Upon successful completion of this course, students will:

1. Operate test equipment, including oscilloscope.
2. Identify various sources of electricity in alternating (AC) circuits
3. Analyze AC circuits using applicable mathematical formulas.
4. Troubleshoot various AC circuits using schematic diagrams.
5. Apply and interpret basic principles of magnetism

Methods of Assessment:

Outcomes 1,2,3,4,5 will be assessed by:

- Exams
- Homework
- Labs
- Quizzes

Required text(s), optional text(s) and/or materials to be supplied by the student:

An appropriate electronics text covering A.C. circuits. Example-Electronics Principles by Floyd 9th edition.
Calculator – scientific with Sine, Cosine, Tangent capabilities.

Suggested Course Maximum:

30 Lecture 20 Laboratory

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

Lecture facilities for 30 students. Laboratory facilities for 20 students must include 10 bench positions each with a digital meter, logic probe, 50 MHz oscilloscope and probes, bread boarding facility with power supply and signal generator, and a stock of basic circuit components.

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. 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%
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

Curriculum Checklist:

- Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.
- Administrative WCJC Core Course.** Attach the Core Curriculum Review Forms
 - Critical Thinking
 - Communication
 - Empirical & Quantitative Skills
 - Teamwork
 - Social Responsibility
 - Personal Responsibility
- WECM Course** -If needed, revise the Program SCANS Matrix and Competencies Checklist