AC ELECTRICAL CIRCUITS  
Course Syllabus

Course Number: TRGA-1203  
OHLAP Credit: No
OCAS Code: None
Course Length: 42 Hours
Career Cluster: Transportation, Distribution & Logistics
Career Pathway: Aviation Maintenance Technology
Career Major(s): General Aviation

Pre-requisite(s):

Course Description: Students will continue their study of electricity. The student will measure capacitance and inductance, calculate and measure electrical power, voltage, current, resistance and continuity with the use of electrical meters.

Textbooks:
Dale Crane, Dictionary of Aviation Terms, Aviation Supplies and Academics, 1997
FAA, FAR Handbook for Aviation Maintenance Technicians, Jeppesen, Sanders, Inc.. 2001
FAA, Standards for Aviation Maintenance Handbook, Jeppesen, Sanders, Inc.. 1985

Course Objectives:

A. Lesson: AC ELECTRICAL CIRCUITS SAFETY AND TERMS
1. List and practice safety precautions related to electrical circuits.
2. Define terms related to AC electricity.
3. Identify basic AC electrical symbols. (Level 3) (App. B,A,5)

B. Lesson: AC VALUES
1. Discuss the relationship between AC values.
2. Label AC values.

C. Lesson: RESISTIVE AC CIRCUITS
1. § Solve problems to determine values in an AC resistive circuit. (Level 3) (App. B,A,4,5)
2. § Determine power in an AC resistive circuit. (Level 3) (App. B,A,4,5)

D. Lesson: OSCILLOSCOPES
1. Discuss the operation of an oscilloscope.
2. Describe the construction of an oscilloscope.
3. Demonstrate use of an oscilloscope.

E. Lesson: INDUCTIVE AC CIRCUITS
1. Differentiate between inductance, reactance, and inductive reactance in an inductive AC circuit. (Level 2) (App. B,A,1)
3. Analyze an AC inductive circuit. (Level 3) (App. B,A,1,2,3,5)
4. Define phase relationships between voltage and current in an AC inductive circuit.
F. **Lesson: TRANSFORMERS**
1. Discuss mutual inductance.
2. Determine relationships between turns, ratio, voltage ratio, and current ratio.
3. Calculate primary and secondary values.
4. Discuss the three types of power loss.

G. **Lesson: CAPACITIVE AC CIRCUITS**
2. Calculate values in an AC capacitive circuit. (Level 2) (App. B,A,1,2)
3. Analyze an AC capacitive circuit. (Level 2) (App. B,A,1)
4. Define the phase relationship between voltage and current in an AC capacitive circuit.

H. **Lesson: RESISTIVE INDUCTIVE (RL) CIRCUITS**
1. Discuss the interrelationship of resistance and inductive reactance.
2. Define impedance.
3. Calculate all values in an RL circuit. (Level 3) (App. B,A,1,5)

I. **Lesson: RESISTIVE CAPACITIVE (RC) CIRCUITS**
1. Discuss the interrelationship of resistance and capacitive reactance.
2. Calculate all values in an RC circuit. (Level 3) (App. B,A,1,5)
3. Analyze an RC circuit (Level 2) (App. B,A,1)

J. **Lesson: RESISTIVE, INDUCTIVE, CAPACITIVE (RLC) CIRCUITS**
1. Discuss the interrelationship of resistance, inductive and capacitive reactance.
2. Calculate all values in an RLC circuit. (Level 3) (App. B,A,1,5)
3. Analyze an RLC circuit. (Level 2) (App. B,A,1)

**Teaching Methods:** The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

**Grading Procedures:**
1. Students are graded on theory and shop practice and performance.
2. Each course must be passed with seventy (70%) percent or better.
3. Grading scale: A=90-100%, B=80-89%, C=70-79%, F=0-69%.

**Available Certifications/College Credit**
The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

**College Credit Eligibility:** The student must maintain a grade point average of 2.0 or better.