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Spring 1-2016

### ETEC 106.01K: AC Circuit Analysis

Wally L. Higgins

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The University Of Montana - Missoula  
College Of Technology  
Department of Applied Computing and Electronics  
Course Syllabus

**EETC 106-SP16-Higgins AC Circuit Analyses**

Credits: 3

Term: Spring 2016

**Meetings:**

Monday and Wednesday 1:00-2:00 pm and Thursday 1:00-3:00 pm in HB06

**Faculty Contact:**

Wally Higgins, Instructor - wally.higgins@umontana.edu Phone: 406-243-7922  
Office Hours: MW 11:00-12:00; T 10:30-11:00 & 2:30-3:00pm and by Appt. Office: Grizhouse 8  
Final Exam: Tuesday 5/10 3:20pm-5:20pm

**Course Description:**

The study of Alternating Current as a continuation of the EETC 105 (195T) Direct Current course (Pre-req). We will continue with the same text book, lab manual and use the Multisim simulation program if available. We will review what you learned in EETC 105 and proceed to Electromagnetism, AC Current and Voltage, Capacitance, Induction, Transformers and further topics in the text as time allows.

**Course Overview:**

This course introduces the concepts of Alternating Current and Voltage. We will take a look back at Resistive series-parallel circuits then proceed to Electromagnetism, Capacitors, Inductors and Transformers. We will also look at some basic filter (RL & RC) electrical circuits if possible.

Although not defined as a pre-requisite, the ability to perform basic algebra (Math 90 or higher is a pre-requisite) will be an essential component for a student to be successful in this course!

The online Moodle course shell includes PowerPoint presentations and short video presentations (webcasts) to supplement reading materials. An internet connection with reasonable (DSL) bandwidth is recommended. If you haven't worked in Moodle please review the UMOonline 101 link on the right hand side of the class home page.

This course is being taught by Wally Higgins who is available via email and in-person on MW from 11:00 – 12:00pm; T 10:30-11am & 2:30-3:00pm or by appt. in Room F of Grizhouse 8 Phone 406-243-7922.

**Course Objectives:**

Upon completion of this course students will be able to:

- Describe the principles of magnetism and electromagnetism.
- Describe the characteristics of capacitors and inductors, and identify and design capacitor and inductor circuits.
- Describe the characteristics of transformers, and identify and design transformer circuits.
- Describe the characteristics of simple passive filters, and identify and design simple passive filter circuits.
- Be prepared to proceed to the hands-on EET113 lab course.

**Required Materials:**

Principles of Electronic Circuits; Ninth Edition; Thomas Floyd; Pearson Prentice Hall; 2010

Scientific Calculator (recommend T1 84-Titanium, TI 86, or TI 89)

Multisim circuit simulation software: Here is a link for its purchase and download. (Not required but handy)

<http://www.studica.com/us/en/National-Instruments/multisimstudentedition.html>

**Evaluation Procedures:**

Grades will be assessed as follows:

<u>Assessment Area:</u>		<u>Grading Scale:</u>	
Homework Assignments	25%	90-100%	A
Exams	50%	80-89%	B
Lab Manual assignments	25%	70-79%	C
		60-69%	D

**Academic Conduct:**

Academic honesty is expected of all students. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at:

<http://www.umt.edu/SA/VP/SA/index.cfm/page/1321>

Using the Web to research materials and concepts is an integral part of learning in the twenty-first century. Studying with other students is a productive method of learning. A certain amount of collaborating on concepts with other students and using resources found on the Internet in an assignment is recommended. Copy and paste is not acceptable. It is expected that each student will input his/her assignment into the computer, and each student must be able to explain any assignment turned in. Collaboration on exams is strictly forbidden.

**Dropping and Adding Courses or Changing Sections, Grading or Credit Status:**

University Policy for dropping courses or requesting grading/credit status changes can be found in the catalog or on the web <http://www2.umt.edu/catalog/acpolpro.htm#adding>. All students should be familiar with the policy.

**Disability Accommodations Policy:**

Students with documented disabilities will receive appropriate accommodations in this course when requested in a timely manner. Please be prepared to provide a letter from the DSS Coordinator and a description of the requested accommodation to the instructor.

**Exam, Quiz, and Homework Assignment Policy:**

All quizzes and homework assignments are to be completed on-time. Late assignments will be accepted at the instructor's discretion. Exams are only to be completed on the assigned date. Rescheduling of an exam will be approved at the discretion of the instructor and only in extraordinary situations.

**Technical Support for Online Students:**

Technical support is available through <http://umonline.umt.edu> and by telephone at 406.243.4357 for the IT Central Help Desk and 406.243.6394 for Moodle specific questions.

### **Topic Outline for EET 105 DC Circuit Analysis**

1. Quantities and Units
2. Voltage, Current and Resistance
3. Ohm's Law
4. Power and Energy
5. Series Circuits
6. Parallel Circuits
7. Series Parallel Circuits
8. Circuit Theorems and Conversions

### **Topics Outline for EET106 AC Circuit Analyses**

Short review of DC Circuits Chpts.1-8

9. Magnetism and Electromagnetism ()
10. Alternating Current and Voltage
11. Capacitors
12. Inductors
13. Transformers
14. RC,RL,RLC and Filters Circuit Analysis (\*as course flow allows)