

1-2015

## ETEC 105.50K: DC Circuit Analysis

Wally Higgins

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### Recommended Citation

Higgins, Wally, "ETEC 105.50K: DC Circuit Analysis" (2015). *Syllabi*. 2949.  
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The University Of Montana - Missoula  
Missoula College  
Department of Applied Computing and Electronics  
**Course Syllabus**

**ETEC 105 50 – SP15 - Higgins DC Circuit Analysis**

Credits: 4

**Meetings:**

Asynchronous Online  
Final exam is online during finals week

**Faculty Contact:**

Wally Higgins, Instructor  
Office Hours: 12:00 – 1:00pm MW  
12:00 – 12:30 TR or by appt.  
Final Exam: Online during Finals week

Email: wally.higgins@umontana.edu  
Phone: 406-243-7922

Office: Griz House 8 - F

**Course Description:**

Study of current flow, direct current circuits, and concepts of power. The introduction of currents and impedances using circuit analysis and problem solving techniques.

**Course Overview:**

This course introduces the concepts of electricity, direct current (dc) flow and resistive electrical circuits. It covers scientific notation and metric conversions; electrical components and their schematic symbols; the electrical quantities of resistance, voltage, current, power, magnetism and electro-magnetism plus their units of measurement; Ohm's law, Watt's law, and other circuit theorems. The analysis of series, parallel and series-parallel circuits with text and Multisim circuit simulation software will be covered in this course. Capacitive, inductive, filter electrical circuits and transformers will be covered in the ETEC106 course offered in the Autumn 2015 semester.

**Please note the course requires the purchase and downloading to your personal pc of the Multisim Software to perform the assigned lab experiments from the lab manual accompanying the Floyd text. This software is a onetime purchase and will be used with the ETEC 106 course as well. Instructions for this purchase requirement will be provided and assistance with starting it up on your pc will be available as well. A link to Multisim provided below. Note: an Apple version was not available as of Autumn 2013. There is an iCircuit app for Apple which is an acceptable alternative and works well.**

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 12:00 – 1:00pm MW and 12-12:30pm on T & R in Room F of Griz House 8F. Phone number is 406-243-7922.

**Course Objectives:**

Upon completion of this course students will:

- Use scientific notation to represent numeric values.
- Use metric notation to represent measured and calculated electrical values.
- Describe the characteristics of electrical current flow.
- Identify the value of passive components by color code and other markings.

- Use Ohm's law and Watt's law to calculate values of voltage, current, resistance, and power in an electrical circuit.
- Describe the characteristics of resistors and resistor applications.
- Identify and design series, parallel, and series-parallel electrical circuits.
- Use circuit theorems and conversions in circuit design and analysis.
- Describe the principles of magnetism and electromagnetism. (Start in DC and continue in AC.)

The following will be covered in the AC Circuit Analysis ETEC 106

- 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.

**Required Materials:**

Principles of Electronic Circuits; Ninth Edition; Thomas Floyd; Pearson Prentice Hall; 2010  
(This text is bundled with the lab manual so make certain you acquire both).

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

Multisim circuit simulation software: Here is a link for its purchase and download:

<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/VPSA/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
9. Magnetism and Electromagnetism (studied in the end of DC and start of AC course)

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

10. Alternating Current and Voltage
11. Capacitors
12. Inductors
13. Transformers
14. RC Circuit Analysis
15. RL Circuit Analysis
16. RLC Circuits and Resonance
17. Filters