Circuit Analysis I

**EET 110**

# Course Syllabus

# Fall 2021

Instructor: Dr. Hamid Allamehzadeh

Office: COB 161

Office Phone: 562-2073

Office Hours: MW 11.00-11:50 AM, TR 8:30-9:30 AM, TR 10:50-11:50 AM, F by appointment. Office hours are through zoom or other software

Time: MW 9:00-9:50 AM

Location: COB 156

Course Description:

This course presents the concept of loop equations for series, parallel, and series-parallel circuits involving DC power supplies. The course also introduces Analog circuit simulation, network reduction principles, and various approaches for problem solving.

Course purpose:

This course will focus mostly on resistive DC circuits. Students will become familiar with Ohm’s law, Kirchhoff’s laws, and various series and/or parallel circuits including usage of Network Theorems like Superposition Theorem, Nodal and Mesh Analysis Techniques, and Thevenin Theorem in circuit analysis and reduction.

Course Objectives:

To develop an understanding of circuit analysis that will enable students to:

1. Define and explain resistance, voltage, current, energy, and power.
2. Explain Ohm’s law and apply it to series, parallel, and series-parallel circuits.
3. Have a clear concept of Kirchhoff’s current and voltage laws and their applications in circuit reduction.
4. Have a clear understanding of Network Theorems including Superposition Theorem, Nodal and Mesh Analysis Techniques, and Thevenin Theorem.
5. Use the above Network Theorems to analyze and simplify any types of DC circuits.

Instructional Methods:

This course will consist of lectures, class discussions, projects (or labs), individual / group activities, student presentations, and review of daily assignments.

In this course labs and assignments are aimed at helping students with (1) hands-on experience; (2) allowing students to use their minds well; and (3) providing a framework for decision making regarding the outcome of the laboratory experiments, or projects. I believe in academic excellence and encourage all of you to do your best, while I am providing a creative, supportive detailed and warm ambience in the classroom.

**Required:**

**Textbook**: Principles of Electric Circuits (By Thomas L. Floyd, Tenth Edition)

**Laboratory Manual**: Experiments in Basic Circuits theory and applications (By David Buchla, 10th Ed.)

**Equipment package** listed to complete all laboratory assignments

Recommended Book: Introductory Circuit Analysis (By Robert L. Boylestad, 12th Edition)

Prerequisite Math 104 (May be taken concurrently)

Grading: TESTS 80% (20%, 20%, and 30%)

LABS 15%

H.W. 15%

A = 90 - 100%

B = 80 - 89%

C = 70 - 79%

D = 60 - 69%

Notes:

1. Academic Integrity: Students are responsible for achieving academic and course goals and objectives as prescribed by the instructor and for demonstrating attainment in an honest manner. Any dishonesty in homework will result in receiving grade F for the course or losing the total points for that specific homework. Cheating in Exam results in automatic grade F in the course and possible expulsion from the university.

2. Attendance: Every student who is registered for the course must attend the class periods. Any failure in attendance will result in 5 points deduction per hour, and change in the grade by one letter for 3 hours absences.

Chapter Problems:

Students will solve selected problems that are representative of each chapter, and assigned weekly. Each assignment must be turned in at the beginning of the class, and it will be graded and returned to the class. The due dates will be announced both in class and on Blackboard.Homework should be neat and legible. Make sure to write your name, the course number and assignment number on the top of the first page. All answers should be given in three significant figures.

Laboratory Assignments:

During this course each student will complete a set of laboratory assignments related to the materials covered in the course. These assignments should provide students with hands-on experience and benefit them for future work. These assignments will also be graded, and returning to the class. The due dates will be announced both in class and on Blackboard.

I encourage all students who live in Portales/ Clovis area to come to class and try to conduct their lab assignments in the EET laboratory (COB 154) at ENMU. However, the students who take this course online may also complete their laboratory assignments by

1. Conducting their labs in the EET Laboratory on campus (COB 154) if they live in Portales-Clovis area. The EET lab is open on Fridays from 9:00am-5:00 pm (full-day) with TAs in the lab. Monday-Thursday the EET lab is open at least 4 hours a day. Students also can complete their labs by appointment on Monday-Thursday.
2. Creating a simple laboratory at home by purchasing some basic instruments like Digital Multimeter (DMM), breadboard, inexpensive analog or digital oscilloscope, function generator and electronic parts and conducting their experiments at home and fax or email their results to me.

I made an agreement with an electronic company to package all the necessary equipment and parts for EET 110 L and on-line students would be able to order it either through Circuit Specialist Company or ENMU bookstore. On-line EET 110 students need to purchase the packet (If they do not have equipment at home to conduct their labs) and charge it to their Financial Aids account. The packet contains one triple output bench power supply (2x, 30V/5A), one Multimeter, One breadboard, and all the necessary parts to conduct your EET 110 labs. I recommend that all the online EET 110 students to purchase the packet. You may purchase the package directly from the company or through ENMU bookstore. Students are responsible for reading the equipment manuals and operating them properly. ENMU is not liable for mishandling equipment or any hazard caused by the equipment. Call me if you need help in operating them.

Like face-to-face EET 110 students, online EET 110 students need to complete their lab assignments; therefore, they need equipment and parts at home to complete their labs. I made a special arrangement with Circuit Specialist Company to put an educational package together for online EET 110 students. You may order the package through them or buy the equipment and parts from other vendor to complete you lab assignments.  The equipment and parts in this kit will be used in completing other EET courses lab assignments.

As Kathleen (Circuit specialist sales person) indicated:

All your students have to do is search for EET110L and click on the kit. It has a description of all the items. I also made sure to give you free shipping. 

[EET110L](https://linkprotect.cudasvc.com/url?a=https%3a%2f%2fwww.circuitspecialists.com%2fdevry-intro-to-engr-design.html&c=E,1,ASxJd_z3LHZTA00oF03lV0xyWmGJ3K5UteMofq_fy0MTZa-4qjyV9Peou-e605sw49jQ47txauh8USo4bLIfsDBfRNnXuUKybQlYJDNiH4qxCn0I&typo=1)-Here is the link. They can also find it by going to [circuitspecialists.com](https://linkprotect.cudasvc.com/url?a=http%3a%2f%2fcircuitspecialists.com&c=E,1,AFoTHAlpRZQ6nhiKFl6C9hm6Shj7dJz2Q_SCILDfgmn_GfRIHc5HxgjCb0vsaFPQRRZGAsuXrUb0DslzDyhn4C5zco0AMPDvKHzxKlIe6j7JsTNrE42MMBuw&typo=1) and typing the name in the search box.

Best,

Kathleen Falcone

Purchasing | Circuit Specialists

1-800-528-1417  
[www.circuitspecialists.com](https://linkprotect.cudasvc.com/url?a=http%3a%2f%2fwww.circuitspecialists.com%2f&c=E,1,xjEow3CwVXx-B3_xcud7yzfHOOnwujKqridyedNarn9Gk4T_sfDQvbEd7Qvs5UgxA7-bNka_z2-wdn8sF7-c_xtoNa_Kk4ruDHWDPB2lFbdf9kPi&typo=1)

1. Conducting their laboratory assignments at local college or university laboratory and fax or email me the results.

Major study units:

1. Quantities and Units (chapter1)
2. Voltage, Current, and Resistors (Chapter2)
3. Ohm's law (Chapter3)
4. Energy & Power (Chapter4)
5. Series circuits (Chapter5)
6. Parallel Circuits (Chapter6)
7. Series-Parallel circuits (Chapter7)
8. Circuit Theorems and Conversions (Chapter8)
   1. Superposition Theorem
   2. Thevenin’s and Nortan’s Theorems
   3. Maximum Power Transfer
9. Branch, Mesh, and Nodal Analysis (Chapter9)

Course Outline:

August 18

1. Quantities and Units (Chapter1)
   1. Units of measurements and Metric system
   2. Engineering notations and conversion units

Try to understand & complete Lab 1 of Laboratory Manual (do not turn in)

Read Chapter 1

August 23, 25 (Chapter 2)

1. Voltage, Current, and Resistance
   1. Atomic structure
   2. Electric Charge, voltage, and current
   3. Electric circuits and safety
   4. Type of resistors, power resistors, variable resistors

Homework: Chapter 2: problems 3, 4, 6, 8, 13, 21,22,23,39 (due date: September 1)

Read Lab 2 of Laboratory Manual

August 30, September 1

1. Ohm's law (Chapter 3)
   1. Calculation of voltage, current and resistance in electric circuits using

V = IR mathematical relationship

Homework: Chapter 3: Problems 7, 15,26,30,33 (Due date: September 8)

Complete Lab 3 of Laboratory Manual

September 8

1. Energy and Power (Chapter 4)
   1. Definitions and units of energy and power
   2. Power in an electric circuits
   3. Power supplies and batteries

Homework: Chapter 4: problems 6, 7, 8, 12, 17, 20, 22, 28, 30, 31, 35 (Due date: September 15)

Complete Lab 4 of Laboratory Manual

September 13, 15, 20, 22 (Chapter 5)

1. Series circuits
   1. Total Resistance in series
   2. Kirchhoff’s voltage law
   3. Total power in a series circuit
   4. Analyzing series circuits using Ohm’s law and Kirchhoff’s law
   5. Voltage-divider law

Homework: Chapter 5: problems 8, 19,20,23,24,29,32,34 (Due Date September 29)

Complete Lab 5 & 6 of Laboratory Manual

September 27, 29, October 4, 6

1. Parallel Circuits (Chapter 6)
   1. Total Resistance in parallel
   2. Kirchhoff’s current law
   3. Total power in a parallel circuit
   4. Analyzing parallel circuits using Ohm’s law and Kirchhoff’s law
   5. Current-divider rules and current sources in parallel

Homework: Chapter 6: problems 11, 18, 19,24,26,28,29,32,36 Due Date : October 13

Complete Lab 7 & 9 of Laboratory Manual

October 4 EXAM I

October 11, 13, 18, 20 (Chapter 7)

1. Series-parallel circuits
   1. Analysis of series-parallel circuits
   2. Analysis of Ladder networks
   3. Loading effect of voltmeter in a circuit
   4. Wheatstone Bridge

Homework: Chapter 7: problems 16, 21, 23, 30, 50, 51, 42, 23 (Due Date: October 27)

Complete Lab 10 of Laboratory Manual

October 25, 27, November 1, 3, 8, 10 (chapter 9)

1. Branch, Loop, and Nodal Analysis
   1. Simultaneous equations in Circuit Analysis
   2. Branch current method
   3. Mesh current method
   4. Nodal voltage method
   5. Pspice software in circuit analysis

Homework: Chapter 9: problems 11, 12, 14, 15, 17,18, 20, 21, 28, 29, 31 Due Date November 17

Complete the Lab provided by the instructor (handout)

November 17: EXAM II

November 15, 17, 22, 29 (Chapter 8)

7. Circuit Theorems and Conversions

-Source Conversions

-Superposition Theorem

-Thevenine Theorem

-Maximum Power Transfer

Homework: Chapter 8: problems 2, 6, 11, 18, 32, 36 (Due Date: December1)

Complete Labs provided by the instructor (handout)

December 1

Review for final exam and labs

FINAL EXAM: Monday December 7 from 8:00-10:00 am ( a new schedule might be set by Distant Ed. Staff).

All exams including the final exam is a pencil and paper exam; Due to the pandemic students complete their exams through blackboard. The instructor will go over the procedures for all exams before the exams. Students need a scientific calculator for engineering computation part of the exam. For each exam, students are allowed to use a formula sheet of 81/2 x11 and write necessary formulas on one side of the paper. Due to the pandemic, the final exam will be proctored through zoom on the same day the final exam is scheduled for the course.

# Academic Integrity Policy

Plagiarism and Cheating of any kind on an examination, quiz, or assignment will result at least in an "F" for that assignment (and may, depending on the severity of the case, lead to an "F" for the entire course) and may be subject to appropriate disciplinary action. See the Student Handbook for further information. I will assume for this course that you will adhere to the academic creed of this University and will maintain the highest standards of academic integrity. In other words, don't cheat by giving answers to others or taking them from anyone else. I will also adhere to the highest standards of academic integrity, so please do not ask me to change (or expect me to change) your grade illegitimately or to bend or break rules for one person that will not apply to everyone. Plagiarism is a serious offense. When in doubt, please cite your sources! Please refer to the Catalog for information concerning plagiarism; action can include, but is not limited to failure of the assignment; failure of or a reduced grade for the course; suspension or dismissal from your program of study.

# Disability Statement

If you have or believe you have a disability, you may contact the Accessibility Resources and Testing Center to coordinate reasonable classroom accommodations, access to technology, or other academic assistance. The Accessibility Resources and Testing Center serves students with a wide range of disabilities including but not limited to medical or health impairment, vision or hearing disability, physical disability, learning disabilities, attention deficit disorder, or mental health impairment. All information will be treated confidentially.

Accommodations are not retroactive. They begin only after:

* Appropriate documentation has been received and accepted by the Coordinator of Disability Services
* Letters of Accommodation (LOA) have been prepared
* You have delivered your Letters of Accommodation to your instructors

Appropriate academic accommodations may then be provided for you. You may contact the Accessibility Resources and Testing Center in room 186 Student Academic Services building, phone 575.562.2280.

# FERPA and Privacy

As a student, your educational records are considered confidential. Under FERPA (Family Educational Rights and Privacy Act), your records are confidential and protected. Under most circumstances your records will not be released without your written and signed consent. However, some directory information may be released to third parties without your prior consent unless a written request to restrict this is on file. You can learn more about student rights to privacy at enmu.edu/FERPA.

In this course, we will be working with third party applications online (i.e. wikis, blogs, and other Web 2.0 applications). The different proprietors of these sites may or may not have privacy guarantees and the FERPA policy at ENMU does not apply to these sites. It will be your responsibility to read the privacy documentation at each site. There are many other options to protecting your information at these sites. If you have filed the paperwork and are classified as protected under the ENMU FERPA qualifications, it will be acceptable for you to use an alias when using the Web 2.0 sites required for this course. If you still have concerns, please e-mail me as soon as possible to discuss your options.

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**Title IX**

ENMU is committed to fostering a safe, productive learning environment and we comply with all aspects related to Title IX of the Educational Amendments of 1972 and 34 C.F.R. Part 106. Title IX prohibits sex discrimination to include sexual misconduct defined as harassment, domestic and dating violence, sexual assault, and stalking.

Incidents of harassment or assault can be reported to the Title IX Coordinator at (575)562-2991 or [titleix.coordinator@enmu.edu](mailto:titleix.coordinator@enmu.edu) . Reports can also go to the ENMU Police Department by calling 575-562-2392. If you wish to receive fully confidential support and victim’s advocacy you can contact Arise Sexual Assault Services at (575)226-7263.

# Confidentiality and Mandatory Reporting

# As an instructor, one of my responsibilities is to help create a safe learning environment on our campus.  I also have a mandatory reporting responsibility.  I am required to share information regarding sexual misconduct or information about a crime that may have occurred on ENMU’s campus with the Title IX Coordinator and/or the ENMU Police. Students may speak to someone confidentially by contacting Arise at (575)226-7263.