

DC Circuits (CETT 1403)



Credit: 4 semester credit hours (3 hours lecture, 4 hours lab)

Co-requisite: MATH 1332

Course Description

A study of the fundamentals of direct current including Ohm's law, Kirchhoff's laws and circuit analysis techniques.

Required Textbook and Materials

1. Electronics Fundamentals 8th edition by Thomas L. Floyd
 - a. ISBN-10: 0135072956 | ISBN-13: 9780135072950
2. Notebook
3. Calculator
4. Pencil

Course Objectives

Upon completion of this course, the student will be able to:

1. Apply safety techniques while working on and troubleshooting various circuits and components.
2. Interpret color codes and other descriptors used in electronics.
3. Identify various sources of electricity in DC circuits.
4. Interpret characteristics of voltage, current, resistance and power in DC circuits.
5. Measure voltage, current and resistance in DC circuits using appropriate measuring devices.
6. Analyze DC circuits using appropriate mathematical formulas such as Ohm's Law, Kirchhoff's Law, and the power formula.
7. Troubleshoot various DC circuits using schematic diagrams.

Course Outline

Chapter 1 Quantities and Units

1. Scientific and Engineering Notation
2. Units and Metric Prefixes
3. Metric Unit Conversions
4. Measured Numbers
5. Electrical Safety

Chapter 2 Voltage, Current, and Resistance

1. Atoms

2. Electrical Charge

3. Voltage
4. Current
5. Resistance
6. The Electric Circuit
7. Basic Circuit Measurements

Chapter 3 Ohm's Law, Energy, and Power

1. Ohm's Law
2. Application of Ohm's Law

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3. Energy and Power
 4. Power in an Electric Circuit
 5. The Power Rating of Resistors
 6. Energy Conversion and Voltage Drop in a Resistance
 7. Power Supplies
 8. Introduction to Troubleshooting
- Chapter 4 Series Circuits
1. Resistors in Series
 2. Total Series Resistance
 3. Current in a Series Circuit
 4. Application of Ohm's Law
 5. Voltage Sources in Series
 6. Kirchhoff's Voltage Law
 7. Voltage Dividers
 8. Power in Series Circuits
 9. Voltage Measurements
 10. Troubleshooting
- Chapter 5 Parallel Circuits
1. Resistors in Parallel
 2. Total Parallel Resistance
 3. Voltage in a Parallel Circuit
 4. Application of Ohm's Law
 5. Kirchhoff's Current Law
 6. Current Dividers
7. Power in Parallel Circuits
 8. Troubleshooting
- Chapter 6 Series-Parallel Circuits
1. Identifying Series-Parallel Relationships
 2. Analysis of Series-Parallel Resistive Circuits
 3. Voltage Dividers with Resistive Loads
 4. Loading Effect of a Voltmeter
 5. The Wheatstone Bridge
 6. Thevenin's Theorem
 7. The Maximum Power Transfer Theorem
 8. The Superposition Theorem
 9. Troubleshooting
- Chapter 7 Magnetism and Electromagnetism
1. The Magnetic Field
 2. Electromagnetism
 3. Electromagnetic Devices
 4. Magnetic Hysteresis
 5. Electromagnetic Induction
 6. Applications of Electromagnetic Induction

Grade Scale

- 90 – 100 = A
80 – 89 = B
70 – 79 = C
60 – 69 = D
0 – 59 = F

Course Requirements

1. Work in lab to complete projects assigned.
2. Listen to lectures and take notes.
3. Take quizzes and tests

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability

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requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the online resource:

<http://www.lit.edu/depts/stuserv/special/defaults.aspx>

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office.

Course Schedule

Week	Topic	Reference
1	Course introduction and policies <ul style="list-style-type: none">LectureLab: Multisim on computers	Handouts
2	Electronics Math <ul style="list-style-type: none">LectureLab: Safety ProceduresExam One	Chapter 1
3	Voltage <ul style="list-style-type: none">LectureLab: Chapter Exercises	Chapter 2
4	Current, Resistance <ul style="list-style-type: none">LectureLab: Chapter Exercises	Chapter 2
5	Ohm's Law <ul style="list-style-type: none">LectureLab: Chapter Exercises	Chapter 3
6	Energy, Power <ul style="list-style-type: none">LectureLab: Chapter ExercisesExam Two	Chapters 3
7	Series Circuits <ul style="list-style-type: none">LectureLab: Chapter Exercises	Chapters 4
8	Series Circuits <ul style="list-style-type: none">LectureLab: Chapter Exercises	Chapter 4
9	Series Circuits <ul style="list-style-type: none">LectureLab: Chapter ExercisesExam Three	Chapter 4
10	Parallel Circuits <ul style="list-style-type: none">Lecture	Chapter 5

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Week	Topic	Reference
11	<ul style="list-style-type: none">• Lab: Chapter Exercises Parallel Circuits	Chapter 5
12	<ul style="list-style-type: none">• Lecture• Lab: Chapter Exercises Parallel Circuits	Chapter 5
13	<ul style="list-style-type: none">• Lecture• Lab: Chapter Exercises Series Parallel Circuits	Chapter 6
14	<ul style="list-style-type: none">• Lecture• Lab: Chapter Exercises Series Parallel Circuits	Chapter 6
15	<ul style="list-style-type: none">• Lecture• Lab: Chapter Exercises Series Parallel Circuits	Chapters 6
16	<ul style="list-style-type: none">• Lecture• Lab: Chapter Exercises• Exam Five Magnetism and Electromagnetism	Chapters 7