

Electrical Troubleshooting (ELTN 1443)



Credit: 4 semester credit hours (3 hours lecture, 2 hours lab)

Prerequisite/Co-requisite: INMT 1305

Course Description

Instruction in the maintenance, theory of operation, troubleshooting, and repair of circuits of various residential, commercial, and industrial electrical systems.

Required Textbook and Materials

1. *Audel Millwrights & Mechanics Guide*, Davis & Nelson. 5th edition
 - a. ISBN number is 0-7645-4171-4
2. Equipment to be furnished by students:
 - a. Hard Hat (red)
 - b. Hearing protection (Ear plugs or Muffs 29 NRR+)
 - c. Fire retardant clothing (Nomex or equal)
 - d. Safety Glasses (Z87+)
 - e. Gloves (leather or equal)
 - f. Shoes or Boots (substantial leather or equal w/heels-no open toes)

Course Objectives

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

1. Use multimeters to perform tests on electrical equipment
2. Discuss various types of circuits and electrical systems
3. Demonstrate the proper way to test transformers and motors identify a short circuit, open circuit, and a closed circuit
4. Troubleshoot electric motors and control circuits.

Course Outline

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|------------------------------------|---|
| I. Introduction and safety | IV. Circuit specification- AC and DC |
| A. Introduce the Faculty | A. Define AC |
| B. Discuss basic electrical safety | B. Define DC |
| II. Terminology | V. Amperage and voltage testing instruments |
| A. Discuss basic terminology | A. Explain Voltage and Amperage |
| B. Demonstrate props | B. Test on a DC sys. |
| III. Electrical Code | VI. Electrical systems, voltage ranges and safety |
| A. Discuss the electrical Code | A. Explain AC and DC Systems |
| B. Discuss code of Beaumont | |

Approved 11/201

ELTN 1443
Course Syllabus

- B. Explain voltage and safety
- VII. Transformers and motors
 - A. How transformers work
 - B. How motors work
- VIII. Circuit condition, Lockout / Tagout
 - A. Explain LO/TO
 - B. Demonstrate LO/TO
- IX. Electrical trouble shooting
- A. Explain troubleshooting
- B. Demonstrate troubleshooting
- X. Work permits
 - A. Explain need of permits
 - B. Explain authority of permits
- XI. Inspection and testing –safety
 - A. Inspect Circuit
 - B. Test a permitted circuit

Grade Scale

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

Course Evaluation

Final grades will be calculated according to the following criteria:

Major test	75%
Class participation	25%

Course Requirements

1. The Student will be introduced to Electricity
2. Set up tools for safe work
3. Demonstrate the differences of AC/DC voltage
4. Use AC/DC testing instruments
5. Connect up wiring
6. Work above ground level

Attendance Policy

1. Students in 2 day class are allowed 2 absences.
2. Absence excused or unexcused is counted 6 pts. off final grade.
3. More than 2 unexcused absences can result in an “F” in the course.
4. Being tardy 3 times equals 1 absence (2 pts. each).
5. Students in a 1 day class are allowed 1 unexcused absence.(12 pts. off final grade)

Course Policies

Students must possess and present LIT ID to attend class.

1. Students must show Student ID to enter and remain in class or lab.

2. No food, drinks, or use of tobacco products in class or lab.
3. No foul or harsh language will be tolerated.
4. Turn off all Cell Phones during lectures.
5. Headphones may be worn only upon Instructor approval.
6. Do not bring children to class.
7. No Cheating of any kind will be tolerated. Students caught cheating or helping someone to cheat can and will be removed from the class for the semester. Cheating can result in expulsion from LIT.
8. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an 'F' in the course.
9. Proper Dress. **Any intentional display of under garments will not be tolerated and can result in the student being removed from the class. Pants will be worn belted at the waist to allow the student to walk, climb, stoop and bend as required.** It is the student's responsibility to dress for work as if in an industrial environment, long pants, shirts with sleeves, substantial footwear (full leather shoes or boots with heels, composition oil resistant soles, no sandals, flip flops, cloth shoes). Safety glasses and hard hats will be necessary as the class requires.
10. Internet Usage
 - a. Classroom computers have access to the internet.
 - b. Student usage of the internet will be monitored.
 - c. Proper usage of the internet will be allowed. Used for classroom research or as directed.
 - d. Any unauthorized use of the internet will not be tolerated.
 - e. Improper usage of the internet, such as profanity, pornography, gambling, etc... will result in disciplinary action not limited to expulsion from LIT.

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 requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

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
1-12	Course introduction <ul style="list-style-type: none">• Lecture• Lab: Practice	Chapter 22
13/16	A/C Motors <ul style="list-style-type: none">• Lecture• Lab: Practice	Chapter 23

Contact Information:

Varies by Instructor