



**Angelina College  
Technology and Workforce Division  
ELPT 1411 Basic Electrical Theory  
Instructional Syllabus**

**I. BASIC COURSE INFORMATION:**

**A. Course Description:**

Four hours credit. Basic theory and practice of electrical circuits. Includes calculations as applied to alternating and direct current. Students will be able to explain atomic structure and basic values such as voltage, current, resistance, and power; determine electrical values for combination circuits in direct current (DC) and alternating current (AC) containing resistance, inductance, and capacitance; summarize the principles of magnetism; calculate voltage drop based on conductor length, type of material, and size; and utilize electrical measuring instruments. Three lecture and two lab hours each week. Lab fee.

**B. Intended Audience:**

Freshmen

**C. Instructor: David Turbeville**

Office Location: TW-111

Office Hours: Monday 9-11am, Tuesday 11-1230pm, Wednesday 11-1230pm, Friday 8 - 9am

Phone: (936) 633-5248

E-mail Address: dturbeville@angelina.edu

**II. INTENDED STUDENT OUTCOMES:**

**A. Core Objectives Required for this Course**

- 1. Critical Thinking:** to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.
- 2. Communication:** to include effective development, interpretation and expression of ideas through written, oral and visual communication.
- 3. Empirical and Quantitative Skills:** to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

**B. Course Learning Outcomes for all Sections**

1. Explain atomic structure and basic values such as voltage, current, resistance and power.
2. Determine electrical values for combinational circuits in direct current (DC) and alternating current (AC) containing resistance, inductance, and capacitance.
3. Summarize the principles of magnetism.
4. Calculate voltage drop based on conductor length, type of material, and size.
5. Utilize electrical measuring instruments.

**III. ASSESSMENT MEASURES**

**A. Assessments for the Core Objectives:**

- 1. Critical Thinking:** Students will complete a final circuit design problem, requiring students to develop an electrical circuit for a specific purpose. A standard rubric is used to assess this objective.
- 2. Communication:** Students are required to develop a presentation to demonstrate operation of their final circuit design problem. A standard rubric is used to assess this objective.
- 3. Empirical and Quantitative Skills:** Students will solve DC and AC circuit analysis problems in the form of embedded questions on the final exam. A standard rubric is used to assess this objective.



## **B. Assessments for Course Learning Outcomes**

1. Students will construct various circuits using diagrams and components. Performance is assessed for function and documentation using a checklist.
2. Students will perform various measurements on functional circuits to develop skills using test equipment. Performance is assessed for accuracy and documentation using a checklist.
3. Students will troubleshoot non-functional circuits using a Multimeter and Oscilloscope, with the goal of locating and correcting circuit problems. Performance is assessed on documentation, time required to complete the work, and ability to solve circuit problems independently.

## **IV. INSTRUCTIONAL PROCEDURES:**

This course is being delivered in a hybrid format. This means is that some instruction or activities are delivered outside of the classroom. Content delivered outside of the classroom may include, video, audio, images and links to external websites. Students are encouraged to consult with their instructor if additional instruction is needed.

Lab activities are required in this course. Attendance during the on-campus part of a hybrid course is mandatory. Completion of in-class work is also mandatory.

## **V. COURSE REQUIREMENTS AND POLICIES:**

### **A. Required Textbooks and Recommended Readings, Materials and Equipment**

Text - Ugly's Electrical References 2017, ISBN 978-1-2841-1936-7 Copyright 17

Equipment:

1. 3M Safety Glasses (11326-00000-20)
2. EMT Tool Kit # M2O39875RV1
3. Texas Instrument TI-30X IIS Scientific Calculator

### **B. Course Policies – This course conforms to the policies of Angelina College as stated in the Angelina College Handbook.**

1. **Educational Accommodations** – If you have a disability (as cited in Section 504 of the Rehabilitation Act of 1973 or Title II of the Americans with Disabilities Act of 1990) that may affect your participation in this class, you may fill out the Educational Accommodations application within your AC Portal, under the “Student Services” tab. A Student Success team member will contact you once the application is received. At a post-secondary institution, you must self-identify as a person with a disability in order to receive services; for questions regarding the application process you can visit the Office of Student Success and Inclusion in the Student Center (205A); text 936.463.8078; or email [access@angelina.edu](mailto:access@angelina.edu). To report any complaints of discrimination related to a disability, you should contact Mr. Steve Hudman, Dean of Student Affairs, in Room 101 of the Student Center. You may also contact Dean Hudman by calling (936) 633-5292 or by emailing [shudman@angelina.edu](mailto:shudman@angelina.edu). (Revised 5/22/2018)
2. **Attendance** – Attendance is required as per Angelina College Policy and will be recorded every day. Any student with three (3) consecutive absences or four (4) cumulative absences may be dropped from the class. Records will be turned in to the academic dean at the end of the semester. Do not assume that non-attendance in class will always result in an instructor drop. **You must officially drop a class or risk receiving an F.** This is official Angelina College Policy.



### 3. Additional Policies Established by the Instructor

- Cell phones are very distracting. Use them to accelerate your learning, not to distract you from it. As a courtesy to everyone, phones should be set to vibrate or silent. Step out of class if you have to take a call.
- The EMT Tool Kit contains professional quality tools, and is required for this and all classes that have a lab. It is available through the AC Bookstore.
- No food in the class or lab. A drink only if it has a tight-fitting lid. If you spill it, clean it up.
- I use a sign-in sheet to document attendance. If you forget to sign in, you are absent.
- Each student must demonstrate individual ability to construct, operate or modify a project in order to pass this course.
- In an effort to promote a more professional learning environment, students must wear proper attire. No open-toed shoes, no shorts are allowed. Conductive jewelry should also be removed while working around energized conductors. Handling conductors energized above 48V is never allowed.
- Because safety is valued in the workplace, if you choose to ignore the safety guidelines of the class, I must drop you from class. Please adhere to our safety guidelines.

### VI. COURSE OUTLINE: Description of the Course Activities including due dates, schedules, and deadlines.

At a minimum, there will be a midterm exam consisting of a written exam as well as a demonstration of skills. In addition, there will be a final exam consisting of a demonstration of skills. Additional assignments and quizzes will be completed in class during the course of the semester.

### VII. EVALUATION AND GRADING:

Our goal is for you to become proficient with the tools and equipment needed to be successful. Please be on time for class, and stay until class is over. When you finish an assignment, repeat it to reinforce technique and familiarity. Use your time wisely.

To an potential employer, your grade has meaning. Employers expect that a college graduate is ready to work safely, be on time, and be proficient with the equipment and software used on the job. They expect that you can perform with confidence, and can solve technical problems with limited assistance.

A	Mastery	(Scores 90% or higher on the final project)
B	Very Capable	(Scores 80-90% on the final project)
C	Capable	(Scores 70-80% on the final project)
D	Limited ability	(Scores 60-70% on the final project)
F	Unable to Perform	(Scores below 60% on the final project)

You will work on assignments that build skill and develop problem solving ability. As you complete assignments, your instructor will evaluate your work and provide feedback. The successful completion of each assignment is recorded. Successful completion means that your work meets all requirements for the assignment. Goals may include neatness, proper labeling, demonstrated ability to describe your work, making sure that your project functions correctly, demonstrated safe work practice, and other goals as defined by your instructor. The evaluation checklist will be made available prior to evaluation. You may need to repeat your work until you successfully complete the assignment.

Successfully completing each assignment generates a score of "C". If you are unable to complete an assignment, your score drops to "D". If you are unable to successfully complete more than one assignment you will be dropped for poor performance. Demonstrated ability and confidence is our goal.

A midterm project will be given and assessed in class. The purpose of the midterm is to give you feedback on your abilities, so that you can determine if you should continue with the course. The midterm assessment is for your benefit, but does not impact your overall score for the course. If you do poorly on the midterm, you should consider dropping the course before you are unable to do so.



As the class comes to an end, it is your turn to show your instructor what you can do. Treat the final project as a job interview. You should demonstrate confidence and ability. By completing each assignment, and by practicing your skills, you should be confident in your abilities, and should have no problem scoring well in the course. Scoring of the final project is objective, and is based on a checklist which you will have before evaluation begins. The final project is completed individually, and without assistance. A grading rubric is made available when the final project becomes available.

Your score for this course is based solely on your performance on the final project. Scoring is based on demonstrated ability, which may include calculations, wiring, troubleshooting and demonstration of system operation. Your instructor will assess your work based on the rubric, only after you have verified that your work meets the required outcomes. Once you ask your instructor to assess your work, you cannot make changes or corrections. Be sure that you are finished before you ask your instructor to evaluate your work. Read all instructions carefully and be sure that you understand what is expected. Time extensions are not allowed with the exception of accommodations made as part of the educational accommodation policy mentioned previously in this document.

While this grading system may seem unreasonable, your grade reflects your ability and employers expect that you will be able to function with minimal assistance. Your score for the course is directly tied to your ability. Use your time wisely in class.

- A. The instructor may modify the provisions of the syllabus to meet individual class needs by informing the class in advance as to the changes being made.
- B. As a student enrolled in a Technology & Workforce program, you will encounter certain risks while you are in a classroom, laboratory experience, or in a clinical or practicum setting. In the event that you sustain an injury and/or require any medical testing or care, all resulting medical expenses (hospital, ambulance, or physician fees), are your financial responsibility and not the responsibility of Angelina College or the clinical/practicum site.
- C. Effective August 27, 2012 Angelina College prohibits the use of tobacco products on campus, except in your personal vehicle. This measure was approved by the College Board of Trustees, and includes smoking and smokeless tobacco products.
- D. All Students must complete the “workplace skills” online coursework through Aztec Software prior to applying for graduation. This material was requested by our advisory committee members, who represent many of the employers in our area. These training topics are found at **[nextgen.aztecsoftware.com](http://nextgen.aztecsoftware.com)**

When you apply to graduate, your instructor will check that you have completed the training before approving your request to graduate. The topics are helpful, and fairly simple. They can be completed at your convenience.



## **ELPT 1411**

**This course focuses on basic skills including building circuits, testing and troubleshooting. Projects and Applications get more involved as the semester progresses. Our goal is to be able to work safely and Confidently with electrical components and instruments.**

### **Project Timeline**

- Week 1 Orientation and basic concepts.**
- Week 2 Focus on components and schematic diagrams.**
- Week 3 Build simple DC Circuits. These circuits give practice wiring.**
- Week 4 Measuring with the Meter.**
- Week 5 Project 1 Development**
- Week 6 Project 1 Demonstration and Evaluation**
- Week 7 Project 2 Development**
- Week 8 Project 2 Demonstration and Evaluation**

**Week 8 marks the midterm for the semester. If you are struggling and feel that you cannot complete the course, you may consider dropping before the last day to drop with a “W”.**

- Week 9 AC Circuit concepts and components.**
- Week 10 Project 3 Development**
- Week 11 Project 3 Demonstration and Evaluation**
- Week 12 Project 4 Development**
- Week 13 Project 4 Demonstration and Evaluation**
- Week 14 Final Project Development**
- Week 15 Final Project Development**
- Week 16 Final Project Demonstration and Evaluation**



## Student Information Form

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Student ID: \_\_\_\_\_ Major: \_\_\_\_\_

Personal Email Address: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Cell Phone: \_\_\_\_\_

Home Phone: \_\_\_\_\_

Work Phone: \_\_\_\_\_

### ADDITIONAL CONTACT PERSONS

1. Permanent Contact Person: \_\_\_\_\_

Parent  Spouse  Friend  Other \_\_\_\_\_

Cell Phone: \_\_\_\_\_

Home Phone: \_\_\_\_\_

Work Phone: \_\_\_\_\_

2. Permanent Contact Person: \_\_\_\_\_

Parent  Spouse  Friend  Other \_\_\_\_\_

Cell Phone: \_\_\_\_\_

Home Phone: \_\_\_\_\_

Work Phone: \_\_\_\_\_