



**Angelina College  
Technology and Workforce Division  
ELPT 2419 Programmable Logic Controllers  
Instructional Syllabus**

**I. BASIC COURSE INFORMATION:**

**A. Course Description:**

Four hours credit. Identify and describe digital logic circuits and explain numbering systems; explain the operation of programmable logic controllers; convert ladder diagrams into programs; incorporate timers and counters utilizing programmable logic controllers; and execute and evaluate programs. Prerequisite: ELPT 1411. Two lecture and three lab hours each week. Lab fee.

**B. Intended Audience:**

Intermediate

**C. Instructor: David Turbeville**

Office Location: TW-111

Office Hours: TBA

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. Teamwork:** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

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

1. Identify and describe digital logic circuits.
2. Explain numbering systems.
3. Explain the operation of programmable logic controllers.
4. Convert ladder diagrams into programs.
5. Incorporate timers and counters utilizing programmable logic controllers.
6. Execute and evaluate programs.

**III. ASSESSMENT MEASURES**

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

- 1. Critical Thinking:** Students will design a complete PLC-based control system, requiring students to understand system operation, develop a wiring diagram, develop a control diagram and a ladder logic program. A standard rubric is used to assess this objective.
- 2. Communication:** Students are required to develop a presentation to discuss the operation of their PLC-Based control system. A standard rubric is used to assess this objective.
- 3. Teamwork:** Students will work together in small groups to develop their unique final design project. A standard rubric is used to assess this objective.



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

1. Students will identify and describe digital logic circuits through questions included in the midterm exam. Performance is assessed through a rubric. .
2. Students will demonstrate knowledge of numbering systems through questions included in the midterm exam. Performance is assessed through a rubric.
3. Students will demonstrate knowledge of programmable logic controller operation through questions included in the midterm exam. Performance is assessed through a rubric.
4. Students will demonstrate the ability to convert ladder diagrams into programs through the completion of a final design project. Performance is assessed using an operational checklist.
5. Students will demonstrate the ability to incorporate timers and counters utilizing programmable logic controllers through the completion of a final design project. Performance is assessed using an operational checklist.
6. Students will demonstrate the ability to execute and evaluate programs through the completion of a final design project. Performance is assessed using an operational checklist.

## **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, Materials and Equipment**

Textbook: Programmable Logic Controllers, Publication # 798, Schoolcraft Publishing.

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. **Academic Assistance** – (08 JAN 2018) 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 should see Maria Lopez or Steve Hudman in room 200 of the Student Center. At a postsecondary institution, you must self-identify as a person with a disability; Ms. Lopez and Mr. Hudman will assist you with the necessary information to do so. To report any complaints of discrimination related to 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 phone at (936) 633-5292 or by email [shudman@angelina.edu](mailto:shudman@angelina.edu).
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. Restrict your use of them during class. Step out of class if you have to take a call.
- 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.
- Handling conductors energized above 48V is not allowed.
- 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.
- Food is not allowed in class or lab. Drinks with a lid are allowed, but liquids create a slip and shock hazard.
- I use a sign-in sheet to document attendance. If you forget to sign in or out, you are absent.
- If a team project is assigned, each student must demonstrate ability to construct, operate or modify the project.

### 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 succeed in this career field. 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 as wisely as possible.

To an employer, your grade has meaning. Employers expect that a college graduate is ready to work safely, be on time, and be familiar with tools and equipment used in industry. They will also expect that you can demonstrate ability and confidence, and can solve technical problems with limited assistance.

A	Expert	(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	Avoid	(Scores below 60% on the final project)

We 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 an exercise several times to successfully complete it.

Successfully completing each assignment will maintain a score of "C". If after repeated attempts to be successful, you cannot complete a project, your score drops to "D". If you are unable to successfully complete more than one project you will be dropped for poor performance. Demonstrated ability and confidence is the goal of our coursework. Everyone has a "C" score during the learning portion of the semester.

A midterm project and written exam 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 score is for your benefit, and does not impact the score that you have earned by completing assignments. If you do poorly on the midterm, it may be cause for concern.

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. Scoring of the final project is objective, and based on a checklist which you will have before evaluation begins. Each project will have ten objectives. If you do not meet more than 6 of the outcomes, your score drops to an "F". If you meet 6 of the outcomes, you will earn a "D". If you meet 7 outcomes, you earn a "C". If you meet 8 outcomes, you earn a "B", and lastly if you meet 9 or 10 outcomes you have earned an "A". Your demonstrated ability will determine your score for the class. You will have time to review your work based on the evaluation checklist prior to asking for instructor review. Once instructor review begins, errors cannot be corrected. While this may seem unreasonable, your grade reflects your ability and employers expect that you will be able to function with minimal assistance.

- 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.



## Student Information Form

- We may need to contact you after graduation for job notices. Please provide accurate contact information.
- Please provide an updated resume upon completion of your degree plan.

Date \_\_\_\_\_

Name \_\_\_\_\_

Student ID# \_\_\_\_\_

Major \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

Home phone \_\_\_\_\_

Best time to call Morning Afternoon Evening

Work phone \_\_\_\_\_

Can we call you here? (Yes or No)

Cell phone \_\_\_\_\_

Ok to text you? (Yes or No)

E-Mail \_\_\_\_\_

Can we contact you through social media? \_\_\_\_\_ (Yes or No)

***Please list names & addresses where we may contact you within the next five years.***

Permanent Contact Person \_\_\_\_\_ **(Parent, Aunt, Sister, Brother, Friend)**

Address \_\_\_\_\_

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

Home phone \_\_\_\_\_

Cell phone \_\_\_\_\_

Ok to text? (Yes or No)

Permanent Contact Person \_\_\_\_\_ **(Parent, Aunt, Sister, Brother, Friend)**

Address \_\_\_\_\_

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

Home phone \_\_\_\_\_

Cell phone \_\_\_\_\_

Ok to text? (Yes or No)