



**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 four 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: No text at this time. Manufacturer literature is used.

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 (5/21/2018)** – 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 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. 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.
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.
- 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.

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.

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	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	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 noted. Successful completion means that your work meets the 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 creates 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.

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 score is for your benefit, and does not impact your score for the course. 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. You should demonstrate confidence and ability. Scoring of the final project is objective, and is based on a checklist which you will have before evaluation begins.

Each project will have multiple measurable objectives. If you do not meet more than 60% of the outcomes, your score for the course is an "F". If you meet 60% of the outcomes, your score for the course is an "D". If you meet 70% outcomes, your score for the course is an "C". If you meet 80% outcomes, your score for the course is an "B", and lastly if you meet more than 90% of the outcomes your score for the course is an "A". Your demonstrated ability at the end of the course will determine your grade.

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. Take your time, and review your work prior to calling for evaluation. Time extensions are not allowed with the exception of accommodations made as part of the educational accommodation policy mentioned previously in this document.

- 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. Modified syllabi are available through Blackboard.
- B. As a student enrolled in a Technology & Workforce program, you may 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**

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

- Your email will be added to a mailing list which we use when we receive job information. Please provide accurate contact information. Also provide a resume if you would like for us to send it out. Print

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 _____

Opt-Out of mailing list emails? Yes No

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)