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. <u>**INSTRUCTIONAL PROCEDURES:**</u>

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. <u>**COURSE REQUIREMENTS AND POLICIES:**</u>

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** – 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. (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 of 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

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 which also consists of a written exam and a demonstration of skills. Additional assignments and quizzes will be delivered through Blackboard during the course of the semester.

VII. <u>EVALUATION AND GRADING:</u>

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 exected. Time extensions are not allowed with the exception of accomodations made as part of the educational accomodation 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 drectly 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**

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)