



## INSTRUCTIONAL PACKAGE

EEM-251

PLC Programming & Troubleshooting

Effective Term

Fall/2023/Spring 2024/Summer 2024

# INSTRUCTIONAL PACKAGE

## Part I: Course Information

Effective Term: Fall 2023/Spring 2024/Summer 2024

COURSE PREFIX: EEM-251

COURSE TITLE: Programmable Controllers

CONTACT HOURS: 7

CREDIT HOURS: 3

### RATIONALE FOR THE COURSE:

This course serves to introduce the student to automated control systems using the Allen-Bradley CompaxLogix L16 Programmable controller (PLC). This course provide the prerequisite Knowledge, skills and abilities (KSAs) required for successful completion of more advanced topics such as PLC Applications, Robotics and Automation Controls 1 and 2, AC /DC drives, and Technical Troubleshooting using the FESTO integrated Modular Production System (MPS).

### COURSE DESCRIPTION:

This course is an introduction to programmable control systems with emphasis on basic programming techniques. A variety of input/output devices and their applications are covered.

### PREREQUISITES/CO-REQUISITES:

( ( ACCUPLACER Reading Comp 056 and ACCUPLACER Sentence Skills 058) or ( New ACCUPLACER Reading Comp 235 and New ACCUPLACER Sentence Skills 235) or ( COMPANION Reading 056 and COMPANION Sentence Skills 058) or ( SAT Critical Reading 380) or ( ACT Reading 14 and ACT English 12) or ( Multiple Measures English 1) or (Credit level [ENG 032](#) Minimum Grade of C\* or Credit level [ENG 100](#) Minimum Grade of C\* or Credit level [ENG 155](#) Minimum Grade of C or Credit level [ENG 155](#) Minimum Grade of TC or Credit level [ENG 101](#) Minimum Grade of C or Credit level [ENG 101](#) Minimum Grade of TC ) ) and (Credit level [MAT 032](#) Minimum Grade of C\* or Credit level [MAT 155](#) Minimum Grade of C or Credit level [MAT 155](#) Minimum Grade of TC or Credit level [MAT 101](#) Minimum Grade of C or Credit level [MAT 101](#) Minimum Grade of TC) or ( ACCUPLACER Elementary Algebra 040 or ACCUPLACER Arithmetic 024 or New ACCUPLACER Arithmetic 220 or New ACCUPLACER Adv Algebra 200 or SAT Mathematics 400 or New SAT Mathematics 350 or ACT Math 13 or Multiple Measures Math

### REQUIRED MATERIALS:

Please visit the Bookstore online site for most current textbook information. Use the direct link below to find textbooks. [BOOKSTORE](#).

H19732 Portable PLC - Allen Bradley CompactLogix L16  
Amatrol First Edition, V4.00

## **TECHNICAL REQUIREMENTS:**

Access to Desire2Learn (D2L), HGTC's learning management system (LMS) used for course materials.

Access to myHGTC portal for student self-services.

College email access – this is the college's primary official form of communication.

## **STUDENT IDENTIFICATION VERIFICATION**

Students enrolled in online courses will be required to participate in a minimum of one (1) proctored assignment and/or one (1) virtual event to support student identification verification. Please refer to your Instructor Information Sheet for information regarding this requirement.

## **CLASSROOM ETIQUETTE:**

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

**NETIQUETTE:** is the term commonly used to refer to conventions adopted by Internet users on the web, mailing lists, public forums, and in live chat focused on online communications etiquette. For more information regarding Netiquette expectations for distance learning courses, please visit [Online Netiquette](#).

## **Part II: Student Learning Outcomes**

### **COURSE LEARNING OUTCOMES and ASSESSMENTS\*:**

**Module 1 Describe the basic functions of programmable controllers**

**Module 2 Describe basic PanelView Plus terminal operations.**

**Module 3 Describe PLC programming operations**

**Module 4 Describe the organization, phases, and documentation of PLC programming**

**Module 5 Describe the operation of PLC motor control circuits and instructions**

**Module 6 Describe the function and operation of PLC Timer and Counter instructions.**

**Module 7 Describe the types, operation, and functions of event driven sequencing instructions**

**Module 8 Describe the function and operation of program control instructions.**

**Module 9 Describe the function and operation of math and data move instructions.**

**Module 10 Describe PanelView Plus Application Editing with FactoryTalk View Studio.**

**Module 11 Describe PanelView Plus Application advanced Editing with FactoryTalk View Studio.**

**Module 12 Describe how to recognize and setup analog inputs.**

**Module 13 Describe how to recognize and setup analog outputs.**

**Module 14 Describe the functions and operation of a variety of variable output applications.**

***\*Students – please refer to the Instructor’s Course Information sheet for specific information on assessments and due dates.***

### **GENERAL EDUCATION OUTCOMES:**

This course fulfills the following General Education Outcomes through the EEM 251 assessment. Upon completion of this course, students will be able to:

- Communicate effectively;
- Think critically;
- Self and professional development.

### **Part III: Grading and Assessment**

#### **EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS\***

Students’ performance will be assessed and the weight associated with the various measures/artifacts are listed below.

#### **EVALUATION\***

Tests/Quizzes	30%
Lab Assignments	30%
Shop Practices	10%
Class Participation	10%
Final Exam	20%
	100%

***\*Students, for the specific number and type of evaluations, please refer to the Instructor’s Course Information Sheet.***

#### **GRADING SYSTEM:**

State the College’s or departmental grading system as delineated in the Catalog. Please note the College adheres to a 10 point grading scale A = 100 – 90, B = 89- 80, C = 79 – 70, D = 69 – 60, F = 59 and below.

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the academic calendar for deadlines for add/drop ([ACADEMIC CALENDAR](#)). You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

## Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. **PURSUANT TO 34 CODE OF FEDERAL REGULATIONS 228.22 - RETURN TO TITLE IV FUNDS, ONCE A STUDENT HAS MISSED OVER 20% OF THE COURSE OR HAS MISSED TWO (2) CONSECUTIVE WEEKS, THE FACULTY IS OBLIGATED TO WITHDRAW THE STUDENT AND A STUDENT MAY NOT BE PERMITTED TO REENROLL.**

### *Attendance for Face-to-Face Courses: (Labs)*

*For a 10 week course (summer) the allowed number of absences for courses meeting twice a week is 4 absences. After missing the maximum number of allowed absences a student will be dropped from the course with a W or a WF.*

**For online and hybrid courses**, check your Instructor's Course Information Sheet for any required on-site meeting times.

### *Online/Hybrid Attendance:*

*Students enrolled in distance learning courses (hybrid and online) are required to participate weekly in an submit an on-line ( Amatrol E-Learning) assignment in order to demonstrate course participation. Students showing no activity in the course for two weeks will be withdrawn due to lack of attendance.*

## Part V: Student Resources



### **The Student Success and Tutoring Center (SSTC)**

The SSTC offers to all students the following **free** resources:

1. **Academic tutors** for most subject areas, **Writing Center support**, and **college success skills**.
2. Online **tutoring** and academic support resources.

3. Professional and interpersonal communication **coaching** in the EPIC Labs.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring, contact the SSTC at [ssc@hgtc.edu](mailto:ssc@hgtc.edu) or self-schedule in the Penji iOS/Android app or at [www.penjiapp.com](http://www.penjiapp.com). Email [ssc@hgtc.edu](mailto:ssc@hgtc.edu) or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the [Online Resource Center](#) to access on-demand resources.



## STUDENT INFORMATION CENTER: TECH Central

TECH Central offers to all students the following free resources:

1. **Getting around HGTC:** General information and guidance for enrollment, financial aid, registration, and payment plan support!
2. Use the [Online Resource Center \(ORC\)](#) including Office 365 support, password resets, and username information.
3. **In-person workshops, online tutorials and more services** are available in Desire2Learn, Student Portal, Degree Works, and Office 365.
4. **Chat with our staff on TECH Talk**, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552.

Visit the [Tech Central](#) website for more information. Live Chat and Center locations are posted on the website. Or please call (843) 349 – TECH (8324), Option #1.



## HGTC LIBRARY:

Each campus location has a library where HGTC students, faculty, and staff may check out materials with their HGTC ID. All three HGTC campus libraries are equipped with computers to support academic research and related school work; printing is available as well. Visit the [Library](#) website for more information or call (843) 349-5268.

## Student Testing:

Testing in an **online/hybrid** course and in **make-up exam** situations may be accomplished in a variety of ways:

- Test administered within D2L
- Test administered in writing on paper

- Test administered through Publisher Platforms (which may have a fee associated with the usage) Furthermore, tests may have time limits and/or require a proctor.

Proctoring can be accomplished either face-to-face at an approved site or online through our online proctoring service. To find out more about proctoring services, please visit the [Online Testing](#) section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

## **Disability Services:**

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may be directed to Beth Havens, Director of Student Development on the Conway Campus Jaime Davis, Counselor/Advisor on the Georgetown Campus or Kristin Griffin, Counselor on the Grand Strand Campus. These individuals will review documentation of the student's disability and, in a confidential setting with the student, develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided.

## **STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:**

Horry-Georgetown Technical College prohibits discrimination and harassment, including sexual harassment and abuse, on the basis of race, color, sex, national or ethnic origin, age, religion, disability, marital or family status, veteran status, political ideas, sexual orientation, gender identity, or pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation in educational programs and/or activities.

### ***Title IX Requirements***

All students (as well as other persons) at Horry-Georgetown Technical College are protected by Title IX—regardless of their sex, sexual orientation, gender identity, part- or full-time status, disability, race, or national origin—in all aspects of educational programs and activities. Any student, or other member of the college community, who believes that he/she is or has been a victim of sexual harassment or sexual violence may file a report with the college's Chief Student Services Officer, campus law enforcement, or with the college's Title IX Coordinator, or designee.

\*Faculty and Staff are required to report incidents to the Title IX Coordinators when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

## **INQUIRIES REGARDING THE NON-DISCRIMINATION/TITLE IX POLICIES:**

**Student and prospective student** inquiries concerning Section 504, Title II, Title VII, and Title IX

and their application to the College or any student decision may be directed to the Vice President for Student Affairs.

**Dr. Melissa Batten, VP Student Affairs**

*Title IX, Section 504, and Title II Coordinator*

Building 1100, Room 107A, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5228

[Melissa.Batten@hgtc.edu](mailto:Melissa.Batten@hgtc.edu)

**Employee and applicant** inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Vice President for Human Resources.

**Jacquelyne Snyder, VP Human Resources**

*Affirmative Action/Equal Opportunity Officer and Title IX Coordinator*

Building 200, Room 205B, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5212

[Jacquelyne.Snyder@hgtc.edu](mailto:Jacquelyne.Snyder@hgtc.edu)