Course Syllabus
Fall 2025
School of Science, Technology, Engineering and Mathematics

Course Name:	**Automation Control: PLC I**
Course & Section Number:	**EET165-054**
Meeting Day(s) & Time(s):	**Thursdays 5:10pm to 8:00pm**
Credits:	**2**
Contact Hours:	**Lecture: 1.5 hours, Lab: 1.5 hours**
Text:	***See Course Materials***
Instructor's Name:	**Dan Wedding PhD** • *Doctor of Philosophy in Engineering, University of Toledo (1999)* • *Master of Science in Engineering Science, University of Toledo (1994)* • *Bachelor of Science in Electrical Engineering, University of Toledo (1992)*
Office Hours & Location:	**By appointment, in class room: DC133 or lab room: ET171**
OCC Phone:	**(567) 661-7552**
OCC Email: **	**Daniel_Wedding@owens.edu**

**Please use only Owens's email for course communications.

Disclaimer: The instructor reserves the right to amend this syllabus as deemed necessary and will communicate such amendment to the students in the course. Please note that while unlikely, there is a possibility courses might need to change the delivery method due to external issues like public health concerns, weather issues, etc. If this happens, the college will communicate any changes via email and/or other communication methods.

Catalog description:
This course covers the operation and fundamental programming techniques of Industrial programmable controllers. Topics include: basic industrial control circuits, I/O modules, programmable controller maintenance, program documentation, PLC to PLC communication, numbering systems, troubleshooting, and the history of programmable controllers. This course includes a weekly, hands -on lab. The lab experiments are designed to verify and reinforce the concepts presented in the lecture.

Prerequisite/Corequisites:

AIM 121 or EET 100 or EET 101 or SKT 181 (must have a "C" or better).

Course Materials:

Text: Frank Petruzella, Programmable Logic Controllers, Sixth Edition, Mc Graw Hill Education, ISBN **9781264163342**

If a **print book, e-book, or access code** is required for class, you can access the Owens Community College e-Campus Bookstore by accessing the online link, called "Find Books" on the course schedule for each course section. See the example below.

OER and Owens Community College Library Resources (Open Educational Resources are free online materials for instructor and student use. Some OER material may be available in print in the Owens Community College Library.)

Inclusive Access (I.A.) Materials are included in the cost of the course to save students money through lower negotiated rates with publishers. Courses containing I.A. materials will have it noted on the online class schedule. If your course includes I.A. digital materials, you will receive an email with subject line, "Your inclusive Access Materials," and it will include any codes or digital links.

The email will come to your Owens Community College email from the Owens e-Campus Bookstore on the first day of class, if not before. Be sure to check your spam (junk email) if you do not find it in your inbox. If the email is not in your inbox or spam folder, contact your instructor immediately. You may also see a folder at the top of your course labelled "Course Materials by eCampus." This folder will contain any needed codes or links to needed materials.

If the I.A. materials also include a printed book or are in print form, the item will be shipped to your address of record automatically based on your enrollment in the course. Please note that some courses do not include printed materials in I.A and those materials would need to be purchased separately using the link on the course schedule. When you access the Find Books link you will see which items in a course are included in I.A.

What You Will Learn in the Course

Course Objectives:

Describe PLC architectures and their applications in industry. Use Ladder Logic to program a PLC. Apply debugging techniques for PLC programs. Describe memory technologies and their use within the PLC. Demonstrate the design and implementation of PLC I/O interface circuitry. Reinforce theoretical knowledge with practical applications.

Student Learning Outcomes:
Students will:

Outcome	Where Assessed
1) describe the architecture of the Allen Bradley SCL500 family of PLC's	Homework Average, Midterm Exam, Final Exam
2) use the Logix500 development platform to write and debug PLC programs.	Homework Average, Lab average
3) interface various devices (LEDs, sensors, motors, etc.) to a PLC's I/O	Midterm Exam, Final Exam
4) Describe the wiring and programming of Analog inputs and Outputs	Final Exam
5) configure and use a communications port of a PLC	Average of Lab Assignments, Midterm

Program Outcomes:
The following program outcomes are assessed in this course

Outcome	Where Assessed
Apply Programmable Logic Controllers in an industrial environment.	Overall Course weighted final grade

Institutional General Education Competencies:
As a student at Owens Community College, you will take General Education courses as part of your degree program. While specific to the General Education courses, will be reinforced in many of your degree program major courses and may be measured in your capstone course(s) and others as identified.

Competency	Where Assessed
Demonstrate sensitivity to others' beliefs and values	Lab collaboration as observed by instructor Labs final grade

Technology, Lab, and File Requirements:
None.

Academic Support

Disability Services Resource Center: If you have a disability or acquire one, you may be entitled to receive reasonable accommodations intended to assure you an equal opportunity to participate in and benefit from the program. To receive more information or to register for accommodations, please contact the Disability Resource Center at 567-661-7007, email disability@owens.edu, visit https://www.owens.edu/disability/, or stop by College Hall 124.

Tutoring Services: Owens Community College offers academic tutoring and assistance in a variety of subjects including: accounting, computing, economics, mathematics, science, and writing. For more information go to: https://www.owens.edu/successcenters/.

Counseling Services: Counseling Services provides assistance to students experiencing personal, educational, interpersonal/relationship, family, social, or psychological difficulties. If you feel you may benefit from this service, please contact them at counselingservices@owens.edu. More information is at https://www.owens.edu/counseling/.

Campus and Community Connections: The Center for Campus and Community Connections (College Hall 151) is a walk-in office created to provide retention support through resource stability initiatives and community connections. Go here for more information: https://www.owens.edu/connection/ or contact connections@owens.edu

Owens Library: The Owens Library offers two locations (Toledo and Findlay) as well as online resources. For more information visit https://www.owens.edu/library/.

Other Resources: Students can find more information on campus resources, student support, student life, and security at this link.

General Information

Student Code of Conduct: All students are expected to follow Owens Community College's Student Code of Conduct, which includes academic honesty, encompassing plagiarism. See the Board Policy for more information.

Anti-Discrimination and Harassment & Title IX/Sexual Misconduct: All students, faculty, and staff are expected to follow Owens Community College's Anti-Discrimination and Harassment Policy and the College's Title IX Policy/Sexual Misconduct Procedures and Guidelines. The College strictly prohibits and will not tolerate harassment, discrimination, intimidation, or hostile/offensive working or learning environments.

Religious Accommodations: A student seeking an accommodation for an absence permitted under Ohio's Testing Your Faith Act must provide the instructor with a written email notice with the specific dates for an absence, and must do so not later than fourteen (14) days after the first day of instruction. Alternative accommodations are not retroactive, and no academic penalty will be imposed for an absence under the policy*. The request for an alternative accommodation will be kept confidential. Students with questions about a religious accommodation under Ohio's Testing your Faith Act may contact the College's Office of Academic Affairs: provost@owens.edu The policy may be found on the Owens website: 3358:11-2-63 Accommodation for a Student Absence for the Observance of Religious Beliefs and Practices Policy

Document Collection: Throughout the semester, your instructors may ask for a variety of assignments including tests and/or quizzes for student learning of institutional general education competencies or program assessment. Please save all your class materials until the end of the semester.

Classroom Admittance: OCC classes shall only be attended by the officially registered OCC students or perspective students, instructor of record, guest lecturer, or substitute. Visitors are not permitted to be in the classroom and should not be invited to attend or participate in the class. See FERPA regulations for more information.

Use of AI Tools: This course permits you to use artificial intelligence (AI) tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers, to get guidance on assignments, as long as you do so in an ethical and responsible manner. Essentially, you can think of these tools as ways to help you learn but not to entirely create work for assignments like discussion board posts, essays, presentation slides, and so on. AI is more like your tutor or TA, not a replacement for your independent thinking.
This means that you must:

- Not use AI tools to replace your own thinking or analysis or to avoid engaging with the course content.
- Cite or explain any AI tools you use. Provide the name of the AI tool, the date of access, the URL of the interface, and the specific prompt or query you used to generate the output.
- Be transparent and honest about how you used the AI tool and how it contributed to your assignment. Explain what you learned from the AI tool, how you verified its accuracy and reliability, how you integrated its output with your own work, and how you acknowledged its limitations and biases.

You are accountable for any mistakes or errors made by the AI tool. Always check and edit the output before submitting your work. If you discover any inaccuracies or inconsistencies in the output after submission, notify the instructor immediately and correct them as soon as possible. Using AI tools in an unethical or irresponsible manner, such as copying or paraphrasing the output without citation or transparency, using the output as your own work without verification or integration, or using the output to misrepresent your knowledge or skills, is considered a form of academic dishonesty and will result in a zero grade for the assignment and possible disciplinary action. If you have any questions about what constitutes ethical and responsible use of AI tools, please consult with the instructor **before** submitting your work.

NOTE: Some instructors will also list specific acceptable and unacceptable uses or include a statement like "All written assignments, projects, and exams must be completed independently."

Student Responsibilities & Instructor Expectations

- Turn off cell phones or set to vibrate. Students MUST leave the classroom to answer or use cell phones. Cell phones may NOT be used during tests.
- No smoking, drinking, chewing, vaping, or eating in classrooms or laboratories.
- Attendance, although not mandatory, is expected.
- In the event of an absence, it is the student's responsibility to obtain missed notes, handouts, or assignments.
- For information on FERPA, Cheating and Plagiarism, Assessment of Student Learning Outcomes and Student Code of Conduct, please see the appropriate section of the current Owens College Catalog online.
- Each student will hand in individual lab work.
- Laboratory work and Homework assignments will be due one week after the scheduled assignment(s).
- All assignments will be submitted via the course Blackboard gradebook.

How Grades are Determined and Major Assignments

Lecture: Lecture notes are provided each week on blackboard in the form of PowerPoint slides that summarize the weekly chapter topics from the text.

Homework: Assigned homework is due one week after the week it is assigned. All homework assignments must be uploaded to the appropriate blackboard assignment. Paper submissions will not be graded.

Labs: Assigned lab work is due one week after the week it is performed. Details of what items must be included in the lab submission are listed on the assignment. All lab assignments must be uploaded to the appropriate blackboard assignment. Paper submissions will not be graded.

Tests: The Midterm Exam and Final Exam are taken at home and are open book open note. All completed exams must be uploaded to the appropriate blackboard assignment. Paper submissions will not be graded. Exams will not be accepted past the posted due date and time.

Evaluation Measure	Student Learning Outcomes Assessed	Weight
Homework Average	1 and 2	20%
Lab Assignment Average	2 and 5	40%
Midterm Exam	1, 3, and 5	20%
Final Exam	1, 3, and 4	20%

Grading Procedure:
Grades will be calculated on the following scale.

90% and Above	A
80% to Less than 90%	B
70% to Less than 80%	C
60% to Less than 70%	D
Less Than 60%	F

Tentative Class Assignments:

Week	Date	Topic	SLO
1	8/28/2025	**Topic:** Introduction to PLC's- PLC Overview, PLC Hardware components **Reading**: Chapters 1 and 2 **Homework:** None **Lab:** None	1, 3
2	9/4/2025	**Topic**: Numbering Systems and Codes **Reading**: Chapters 3 **Homework:** Homework 1 – Due 9/12/2025 **Lab**: Lab 1 – Due 9/12/2025	2
3	9/11/2025	**Topic:** Fundamentals of Logic (AND, OR, NOT, XOR) **Reading**: Chapter 4 **Homework:** Homework 2 – Due 9/19/2025 **Lab**: Lab 2 – Due 9/19/2025	2
4	9/18/2025	**Topic:** Basics of PLC programming- Memory organization, I/O addressing, program scan cycle, Programming Languages, Bit level instructions. **Reading:** Chapter 5 **Homework:** Homework 3 – Due 9/26/2025 **Lab:** Lab 3 - Due 9/26/2025	1, 2
5	9/25/2025	**Topic:** Wiring and Logic- Developing Fundamental PLC Wiring Diagrams and Ladder Logic Programs **Reading:** Chapter 6 **Homework:** Homework 4 – Due 10/3/2025 **Lab:** Lab 4 – Due 10/3/2025	2

6	10/2/2025	**Topic:** Programming Timers **Reading:** Chapter 7 **Homework:** Homework 5 – Due 10/10/2025 **Lab:** Lab 5 – Due 10/10/2025	2
7	10/9/2025	**Topic:** Programming Counters, Midterm review **Reading:** Chapter 8 **Homework:** Homework 6 – Due 10/17/2025 **Lab**: Lab 6 – Due 10/17/2025	2
8	10/16/2025	**Test:** Midterm exam- Covers all materials weeks 1 thru 7. – Due 10/22/2025	1, 3, 5
9	10/23/2025	**Topic:** Program Control Instructions **Reading:** Chapter 9 **Homework:** Homework 7 – Due 10/31/2025 **Lab:** Lab 7 – Due 10/31/2025	2
10	10/30/2025	**Topic:** Data Manipulation Instructions **Reading:** Chapter 10 **Homework:** Homework 8 – Due 11/7/2025 **Lab:** Lab 8 – Due 11/7/2025	2
11	11/6/2025	**Topic:** Math Instructions **Reading:** Chapter 11 **Homework:** Homework 9 – Due 11/14/2025 **Lab**: Lab 9 – Due 11/14/2025	2
12	11/13/2025	**Topic:** Sequencers and Shift Register Instructions **Reading:** Chapter 12 **Homework:** Homework 10 – Due 11/21/2025 **Lab:** Lab 10 - Due 11/21/2025	2
13	11/20/2025	**Topic:** Analog Measurements **Reading: None** **Homework:** None **Lab:** Lab 11 (Demo) – Due 11/28/2025	2, 4
14	11/27/2025	**Thanksgiving – no class**	
15	11/27/2025	**Topic:** Installation Practices, Editing, and Troubleshooting **Reading:** Chapter 13 **Homework:** None **Lab:** OPEN LAB	2, 3
16	12/4/2025	**Test:** Final Exam- Covers all materials weeks 1 thru 14	1, 3, 4