



## **Course Syllabus: Programmable Logic Controls**

McCoy School of Engineering  
EENG 4163 - Section 101  
Fall 2026

### **Contact Information**

Instructor: Dr. Yuyao Wang  
Office: Martin Hall 111  
Office hours: Monday, Wednesday and Friday 10:00 am - 11:00 am; Wednesday, Thursday 2:30 pm - 3:30 pm  
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Lecture: Tuesday 12:30 pm - 2:20 pm, MY 136.  
Lab: Tuesday 2:30 pm - 4:20 pm, MY 118.

### **Course Description**

This course focuses on Programmable Logic Controller (PLC) programming using open-loop and closed-loop control strategies. Topics include PLC hardware components, ladder logic, timers, counters, comparison instructions, math functions, Human Machine Interfaces (HMIs), motor control, Variable Speed Drives (VSDs), and the built-in PID function. The course also covers the electrical and electronic principles that support PLC operation. A companion laboratory provides hands-on practice.

**Prerequisite:** EENG 3273 - Fundamentals of Robotics.

### **Textbook & Instructional Materials**

#### **Required textbook:**

Frank D. Petruzella, Programmable Logic Controllers, 6th Edition or 2025 Evergreen Release, McGraw-Hill. ISBN-13: 978-1264163342 or 978-1266016394.

**Software and laboratory systems:** RSLogix 500, Studio 5000, PanelBuilder32, FactoryTalk View Studio, AB SLC 5/05, and AB CompactLogix.

## Study Hours and Tutoring Assistance

Plan to spend several hours each week outside class reviewing lecture and lab material and completing homework. Review the course content before starting an assignment, do not wait until the last minute to prepare for an exam, and use office hours when you need help. Additional tutoring may be available through the MSU Academic Success Center.

## Student Handbook

Refer to: [Student Handbook](#)

## Academic Misconduct Policy & Procedures

Academic dishonesty includes cheating, collusion, and plagiarism, including using another person's work without proper credit or submitting work that is not your own. These actions are prohibited. Additional guidelines are available from the [Office of Student Conduct](#).

## Moffett Library

Moffett Library provides books, peer-reviewed journals, databases, multimedia materials, equipment checkout, study rooms, and research help. Visit the [Moffett Library webpage](#) to learn how to access these resources.

## Grading

The final course grade is determined by the weighted percentages in Table 1. The letter-grade scale is shown in Table 2.

*Table 1: Percentage contribution of each grade item*

| Grade Item   | Contribution |
|--------------|--------------|
| Midterm Exam | 25%          |
| Final Exam   | 25%          |
| Labs         | 25%          |
| Homework     | 20%          |
| Attendance   | 5%           |
| Total        | 100%         |

Table 2: Letter-grade scale

| Grade | Percentage |
|-------|------------|
| A     | 90-100     |
| B     | 80-89      |
| C     | 70-79      |
| D     | 60-69      |
| F     | Below 60   |

### **Homework**

Homework is assigned from selected chapters of the textbook and must be submitted through D2L by 11:59 p.m. on the due date.

### **Exams**

The course includes one midterm exam and one final exam. Each exam accounts for 25% of the final grade. Exam dates, coverage, and permitted materials will be announced in class and through D2L.

### **Mid-Term Exam**

One midterm exam is planned for Week 8 during the regular class meeting and accounts for 25% of the final grade. Exam coverage, permitted materials, and any schedule change will be announced in class or through D2L.

### **Final Exam**

The final exam will be comprehensive and accounts for 25% of the final grade.

### **Late Work**

Late homework may be accepted with a 20% deduction from the earned score.

### **Make Up Work/Tests**

Make-up exams or labs are given only for an emergency supported by documentation or for a documented conflict caused by a scheduled athletic event or conference. Contact the instructor as soon as possible.

### **Important Dates**

- Last day for term schedule changes: See the [MSU Academic Calendar](#) for Fall 2026.
- Deadline to file for graduation: See the [MSU Academic Calendar](#) for Fall 2026.

### **Desire-to-Learn (D2L)**

D2L will be used to post homework assignments and grades, as well as to share course announcements and general information. You can log into [D2L](#) through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program.

### **Attendance**

Attendance is required for each student. For each unexcused absence, 1 point will be deducted from the Attendance & Class Performance grade. Students arriving more than 30 minutes late are permitted to sit in the class, but one absence will be counted.

Students are expected to attend all meetings of the classes in which they are enrolled. Although in general students are graded on intellectual effort and performance rather than attendance, absences may lower the student's grade where class attendance and class participation are deemed essential by the faculty member. Instructor's records will stand as evidence of absences. A student with excessive absences may be dropped from a course by the instructor. Any individual faculty member or college has the authority to establish an attendance policy, providing the policy is in accordance with the General University Policies.

### **Online Computer Requirements**

This is a face-to-face course, but homework and course information are managed through D2L. Students must have reliable access to a computer and the internet. Personal computer or connectivity problems are not valid reasons for late submission. On-campus computers are available at Moffett Library and the Academic Success Center.

## **Recording Classes**

Recording classes is generally prohibited without the professor's explicit permission. When permitted, recordings are for personal use only and may not be uploaded, shared, transmitted, or published without the professor's prior consent. Students who need recordings as a disability accommodation must obtain prior approval from Disability Support Services.

## **Instructor Class Policies**

**Classroom conduct.** Once class starts, the use of cell phones, reading of newspapers, private discussions, unauthorized use of computers, work unrelated to the course, and derogatory remarks about classmates or the instructor are not accepted and may result in dismissal from the class. Each documented violation deducts 1 point from the Attendance & Class Performance grade.

**Generative AI policy.** Generative AI tools may assist with understanding theoretical concepts, but their outputs should be approached with caution. Do not rely on AI tools for homework solutions or hardware design; AI-generated answers may be incorrect, and students remain fully responsible for the correctness of all submitted work. Submitting AI-generated content as original work is treated as academic dishonesty under the Academic Misconduct Policy.

## **Change of Schedule**

A student dropping a course, but not withdrawing from the University, within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a 100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

## **Refund and Repayment Policy**

A student who withdraws or is administratively withdrawn from Midwestern State University may be eligible for a refund of all or part of the tuition, fees, and room or board charges paid for the semester. If the student received financial aid, all or part of the refund may be returned to the financial-aid programs. Federal and state formulas are used to determine the refund amount.

## **Services for Students with Disabilities**

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University provides reasonable accommodations to ensure equal opportunity for qualified persons with disabilities. Students who need accommodations should apply through [Disability Support Services](#), located in the Student Wellness Center, (940) 397-4140. Current documentation is required, and each request is reviewed individually.

## **Emergency Aid Resources for Basic Needs**

Unexpected circumstances can affect a student's ability to meet basic needs such as housing, utilities, food, transportation, health care, technology, or textbooks. Visit the [Student Emergency Support and Resources webpage](#) or contact the Office of Student Affairs at (940) 397-7500 or [student.affairs@msutexas.edu](mailto:student.affairs@msutexas.edu).

## **College Policies**

### *Campus Carry Rules/Policies*

Refer to: [Campus Carry Rules and Policies](#)

### *Smoking/Tobacco Policy*

Midwestern State University seeks to provide a safe, healthy, pleasant environment for its faculty, staff, and students. To this end, the use of tobacco products, including smoke and smokeless tobacco, and the advertising, sale, free distribution, and discarding of tobacco products shall be prohibited in all indoor and outdoor facilities and in all university vehicles. The policy extends to faculty, staff, students, vendors, guests, and visitors.

### *Alcohol and Drug Policy*

Midwestern State University prohibits the unlawful possession, use, or distribution of illicit drugs, including alcohol, on University property or as part of a University-sponsored activity. Students and employees are subject to applicable local, state, and federal sanctions.

### *Campus Carry*

Texas Campus Carry law allows licensed individuals to carry a concealed handgun in buildings on public university campuses except where the University prohibits it. Concealed carry still requires a License to Carry, and openly carrying handguns is not allowed on college campuses. For more information, visit [Campus Carry](#).

### *Active Shooter*

Campus safety is the responsibility of everyone in the community. Review the options and strategies provided by the MSU Police Department on the [MSUReady Active Shooter webpage](#) and watch the [Run. Hide. Fight. video](#).

## Grade Appeal Process

Students should first try to resolve grade questions with the instructor. If the issue is not resolved, review the [Grade Appeal Checklist](#) and the [MSU Catalog](#).

**Notice:** Changes in the course syllabus, procedures, assignments, and schedule may be made at the discretion of the instructor.

## Course Schedule

The schedule below is tentative and may be adjusted based on class progress.

| Week or Module            | Activities/Assignments/Exams                                                         | Due Date     |
|---------------------------|--------------------------------------------------------------------------------------|--------------|
| Week 1<br>Aug. 24-28      | Course introduction; PLC overview                                                    | N/A          |
| Week 2<br>Aug. 31-Sept. 4 | Hardwired relay logic compared with PLC logic; PLC hardware and input/output modules | N/A          |
| Week 3<br>Sept. 7-11      | Number systems and codes; PLC addressing; introduction to the SLC 5/05 platform      | N/A          |
| Week 4<br>Sept. 14-18     | Logic fundamentals; XIC, XIO, and OTE instructions; basic ladder programs            | N/A          |
| Week 5<br>Sept. 21-25     | PLC scan cycle; seal-in circuits; interlocks; ladder-program development             | N/A          |
| Week 6<br>Sept. 28-Oct. 2 | Timer instructions and timer applications                                            | N/A          |
| Week 7<br>Oct. 5-9        | Counter instructions and sequenced control; midterm review                           | N/A          |
| Week 8<br>Oct. 12-16      | Midterm exam; integrated SLC 5/05 programming laboratory                             | Midterm exam |
| Week 9<br>Oct. 19-23      | Comparison instructions; math functions; data handling                               | N/A          |
| Week 10<br>Oct. 26-30     | CompactLogix and Studio 5000; tag-based programming                                  | N/A          |
| Week 11<br>Nov. 2-6       | HMI fundamentals; PanelBuilder32 and FactoryTalk View Studio                         | N/A          |
| Week 12<br>Nov. 9-13      | PLC-HMI integration; operator controls, status displays, and alarms                  | N/A          |

| <b>Week or Module</b>     | <b>Activities/Assignments/Exams</b>                                     | <b>Due Date</b>                                 |
|---------------------------|-------------------------------------------------------------------------|-------------------------------------------------|
| Week 13<br>Nov. 16-20     | Motor controls and variable-speed drives; control interlocks and safety | N/A                                             |
| Week 14<br>Nov. 23-27     | Feedback control and PID; Thanksgiving break                            | N/A                                             |
| Week 15<br>Nov. 30-Dec. 4 | Integrated PLC, HMI, and motor-control applications; final exam review  | N/A                                             |
| Finals Week<br>Dec. 5-10  | Final exam                                                              | Official date and time:<br>University Registrar |