



REEDLEY COLLEGE – MANUFACTURING TECHNOLOGY

SPRING 2021 MFGT 93-56513 PROGRAMMABLE LOGIC CONTROLLERS TTH 12:45 PM-3:35 PM

2 Units, 9 weeks (03/15 - 05/21)

Instructor: Michael Ornelas
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Office: IND 23
Classroom: IND 17
Lab: IND 16
Office hours: **M** 12:00pm-12:30pm **VIRTUAL OFFICE VIA EMAIL**, **W** 7:00am-7:30am & 12:00pm-12:30pm **VIRTUAL OFFICE VIA EMAIL**, **TTH** 7:00am-7:30am & 3:00pm-3:30pm **VIRTUAL OFFICE VIA EMAIL**, **F** **VIRTUAL OFFICE_VIA EMAIL_9AM-10AM_**
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Instructional Materials:

Text Book (Required): **Programmable Logic Controllers**; 4th Edition, The Goodheart-Willcox Company, Inc., Max Rabiee **ISBN: 978-1-63126-932-5**

Description:

This course covers the study of basic Programmable Logic Controllers (PLCs) and the methods of installing, configuring, programming, wiring, operating, and troubleshooting of basic PLCs.

Expected Outcomes:

1. Identify components of a typical PLC such as power supplies, CPU, IO, and communication modules.
2. Design control logic for use on a PLC.
3. Identify PLC components for use within a manufacturing environment.
4. Program, download, and operate a PLC.
5. Troubleshoot process control logic.

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► **Content and order may be changed as deemed necessary by the instructor.**

COURSE OUTLINE

Lecture Content:

1. Introduction to Programmable Logic Controllers
 - a. Defined
 - b. Typical uses
 - c. Anatomy
 - d. Components
 - e. Modes of operation
2. Programming Software
 - a. Languages
 - b. Ladder Logic
 - c. Control Logic
 - d. Discrete functions
 - e. Numeric functions
3. Process of Programming
 - a. Program
 - b. Download
 - c. Run
 - d. Troubleshoot
4. Ladder Logic Control
 - a. Various control circuits
 - b. Relay replacement
 - c. Motor start/stop
 - d. VFD Control

Lab Content:

1. Identification of PLC components
2. Communication with PLC
3. Download simple PLC program
4. PLC Operational modes
5. Motor start/stop
6. VFD Control
7. Programming data types

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Required Materials:

#2 Pencil/Eraser
Basic Calculator (not on cell phone)
3-ring Binder w/ Lined Paper
Clear Safety Glasses
Graph Paper
Scan-Tron #882E (50 front/50 back)

How class will be conducted:

- Lecture
- Demonstrations
- Lab Tasks/Assignments
- Homework Assignments
- Quizzes
- **Final Exam- TH- 5/20/21 (SUBJECT TO CHANGE)**

Attendance:

- Arrive on time and prepared for class
- Attendance and participation is very important. You must attend class to participate and complete all the work.
- Do not leave the classroom or shop area without the instructor's permission. Knowledge of student's presence relates directly to student safety.
- Campus policy requires that all students who miss 2 consecutive weeks before the add/drop deadline to be dropped (**2 class sessions for a 9-week class**).
- Campus policy requires students who have nonconsecutive absences which total the equivalent of two or more weeks are subject to being dropped from the class (**2 class sessions**).
- Two tardies are equivalent to one absence. If you are tardy you must check with the instructor to ensure you are not marked absent.
- Contact the instructor if you know you will be missing class. Failure to do so will directly affect the opportunity to make-up any work given the day of an absence.
- It is the student's responsibility to gather and complete any work missed during an absence.
- It is the students' responsibility to drop any classes they no longer wish to continue.
- Quizzes/tests may be made up at the instructor's direction.

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Grading Procedure: May be changed as deemed necessary by the instructor

Grades are based on your weighted combined points earned in Lab and Lecture:

- Homework 10% of grade
- Lab work 30% of grade
- Tests 20% of grade
- Class participation 30% of grade
- Binder 10% of grade

Grading Scale:

- 100%-90% A
- 89%-80% B
- 79%-70% C
- 69%-60% D
- 59%-0% F

Essential Information:

- Any assignment turned in up to one week late will receive 50% credit.
- Homework will not be accepted more than one week late.
- Attendance and participation are very important. You must be in class in order to participate and complete all the work.
- In the event of class being cancelled you will be notified by a sign on the door.
- Cheating and/or plagiarism will not be tolerated. A student will receive no credit for the assignment if, in the opinion of the instructor, the individual has cheated.
- Cell phones are **PROHIBITED** during lecture/lab. If family or work requires you to have either on, **PLEASE** select vibrate mode and text or talk outside of classroom/shop so not to disturb instruction.
- Foul language will not be tolerated, and student will be asked to leave the classroom if not contained.

IMPORTANT DATES:

March 15 - May 21 (M-F) Short-term classes, second nine weeks

March 29 – April 2 (M-F) Spring recess (Classes reconvene April 6))

May 17-21 (M-F) Final Examinations

May 21 (F) End of Spring Semester 2021

May 21 (F) Graduation Exercises

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Policies and Procedures

Failure to Attend Class

Failure to attend class on a regular basis will adversely affect your performance in this course. Plagiarism or cheating of any kind will result in a grade of “F” for this course. There are no makeup exams without prior permission of the instructor.

Required Reading

Required reading should be completed before the corresponding lecture/demonstration. All grades are final unless an error in math has been made by the instructor. The instructor reserves the right to adjust the course outline, scoring, grading, and content as needed.

Having Trouble?

If at any time you find you are having trouble succeeding in this course whether because of a change in your life circumstances or because of something you do not understand about the material – please see me. There are several services available to assist Reedley College students to succeed in their course work. I would be happy to recommend one of these to you.

Accommodations for students with disabilities:

If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or section 504 of the Rehabilitation Act, please contact me as soon as possible so that reasonable efforts can be made to accommodate your needs.

Keep track of returned work.

You should save all your work until the end of the semester so you can double check the final grade earned as recorded by the instructor.

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