

[PLC's and HMI's for Maintenance]

Spring 2021 • 620-311-3E1A • 2 credits

Meeting Dates and Time: Mondays 8:10 am to 1:10 pm

Start Date: 1/25/21 • **End Date:** 4/26/21

Instructional Delivery Method: Stacked

Location: Gateway Technical College • Elkhorn Campus • 400 County Road H • Elkhorn, WI 53121

Building: South Building • **Room:** 133

Instructor: JD Jones

E-Mail: jonesj@gtc.edu

Phone: 262-564-2767

Office: Elkhorn

Room: 126, 133 or 130

Office Hours:

Monday 7:45 - 8:10 am and 1:10 pm - 2:50 pm Elkhorn

Tuesday 7:45 - 8:10 am and 2:10 pm - 2:30 pm Elkhorn

Wednesday 7:45 - 8:10 am and 2:10 pm - 2:30 pm Elkhorn

Thursday 7:45 - 8:10 am and 1:10 pm - 2:30 pm Elkhorn

Underlined text links out to additional information relating to the topic.

Course Information

Course Description:

In this course the student will learn the basics of how PLCs and HMIs work along with how to replace and download a program to get the machine up and running again. Minor programming changes will be covered. Learning how to communicate to the PLCs and HMIs from a computer will also be covered.

Required Text And Course Materials:

E-Learning Amatrol only 1 code needed for all classes that require it for the semester.

Course Competencies:

1. Explain architecture of a programmable logic controller (PLC).
2. Associate I/O addresses to field devices.
3. Explore binary and hexadecimal number systems.
4. Explore networking standards.

5. Communicate with a processor.
6. Design a programmable logic controller program.
7. Interface programming environment to programmable logic controller.
8. Explore human machine interface (HMI) software.
9. Explore touchscreen hardware.
10. Create HMI screens for various mechatronic systems.
11. Create interactive objects in HMI software.
12. Troubleshoot a machine.

Course Outcome Summary:

Essential Career Competencies:

Gateway believes students need both technical knowledge/skills and core abilities in order to succeed in a career and in life. The core abilities are the general attitudes and skills promoted and assessed in all Gateway programs.

Course Section Requirements & Policies

Course Attendance/Participation Policy:

[Attendance Policy]

Course Grading Policy:

An understanding of the grading guidelines is critical to the successful completion of this course. Please read carefully, and contact the instructor if you have any questions.

Final Grades: This class will have points assigned to each assignment, quiz, participation, test, labs and other activities. The final grade will be computed by taking the obtained points and dividing by the total possible points and turned into a percentage and referenced to the conversion scale to obtain the letter grade.

Late Work:

Coupon

This coupon entitles the student to one **extension** on any project or assignment. The owner must negotiate the new deadline with their instructor. Limit ONE coupon per student, per course, per semester. Not valid with any other offer. Good only with participating instructors. **Offer expires one week before the course ends.** The student needs to print this coupon out and turn into the instructor.

THE STUDENT STILL NEEDS TO DUE THE ASSIGNMENT OR PROJECT!!!!

We all can have a bad day or forget to do an assignment. Below is an Allow me to turn in a LATE assignment coupon. It only allows you one time per semester per class to turn in an assignment late. YOU STILL HAVE TO DO THE ASSIGNMENT. If you decide to use it, please cut and paste it into the top of your late assignment. Please note the date we negotiated for your new deadline and the coupons expiration date.

***The instructor reserves the right to adjust the late policy due to extenuating circumstances.**

Grading Scale: The following grading scale is used in this class:

Grade	Percentage	Grade	Percentage
A	94 – 100	C	74 – 76
A-	90 – 93	C-	70 – 73
B+	87 – 89	D+	67 – 69
B	84 – 86	D	64 – 66
B-	80 – 83	D-	60 – 63
C+	77 – 79	F	< 60

Note: Students in the Electromechanical Maintenance Technician program must earn a "C" or higher in the class or retake it.

Incompletes: An incomplete grade is given only in extenuating circumstances. To request an incomplete grade, a student must have already completed 80% of coursework and have a passing grade at the time of the request. The instructor and student will come up with a plan and timetable when unfinished work will be due. The incomplete grade can hold up a student's financial aid for the next semester, resulting in financial aid probation until the course is completed and a final grade is given.

Key Dates:

1/25/21	1 st class
2/10/21-2/16/21	INSTRUCTOR DROP DATE
3/5/21	Midterm grades
4/7/21	Last date for students to withdraw!
4/26/21	LAST CLASS

Additional Resources:

Student Handbook

Course Section Calendar

[\[Gateway Academic Calendar\]](#)

Course Schedule for Motors and Ind Electrical systems 620-303

The schedule may change to promote learning.

COURSE CALENDAR:

All items are due by 11:59 PM on Saturday of the week number except week 15 will all be due by end of the last day of class. Any item turned in after the due date will be zero points. If a student fails to complete a lab on time he/she will be required to complete it prior to receiving credit for any on-time labs.

Week #	Class date	Items Due
1	1/25/21	Syllabus Test, Lab 1, Elearning Intro to PLC
2	2/1/21	Lab 2, Elearning Discrete I/O Interfacing
3	2/8/21	Lab 3, Elearning Industrial Comm Networks, Troubleshooting Ethernet/IP
4	2/15/21	Lab 4, Elearning Basic PLC Programming
5	2/22/21	Lab 5, Elearning PLC Timer Instruction, PLC Counter and Timer Instruction
6	3/1/21	Lab 6, Elearning PLC Counter Instruction
7	3/8/21	Lab 7, Elearning PLC Sys Troubleshooting & Intro to PLC Troubleshooting
8	3/15/21	Elearning Panelview Plus Application Editing
9	3/22/21	Lab 8, Elearning HMI, Ethernet, and Analog Wiring
10	3/29/21	Lab 9, TBD
11	4/5/21	Elearning Analog Inputs
12	4/12/21	Lab 10, Elearning Analog Outputs
13	4/19/21	TBD
14	4/26/21	Written and hand-on Test

Department Policies

[Link to Department Policies]

To view the current Policies for this programs department, please click the above link.

College Policies

The policies and procedures outlined in the **Gateway Student Handbook.**

Academic Honesty:

Academic integrity is a major expectation in this course. Any student found to be cheating or submitting unoriginal, copied, or plagiarized work in this class will receive an automatic zero on that work.

Alcohol and Drug Policy:

Alcohol in any shape or form is prohibited on all Gateway property without consent. Any illicit drug in any shape or form is prohibited on Gateway properties and campuses. Any persons under the influence of any illicit drug or alcoholic substance, legal or illegal, are prohibited on Gateway properties and campuses.

College Attendance Policy:

Gateway Technical College recognizes the importance of attendance in the learning process but does not believe that attendance in and of itself constitutes learning. Instructors will document in their course syllabi fair and reasonable attendance policies for their classes based on their subject matter, delivery methods, learning activities, student audience, external regulations, and employer expectations in their field of instruction.

Concealed Carry/Weapons Policy:

Weapons including but not limited to firearms and knives are not permitted on Gateway properties and campuses except by authorized law enforcement representatives.

Computer Networking & Information Resources:

Your use of Gateway computing and networking resources and information systems is governed by federal and state law; acceptable Internet use practices; Gateway policies; this Computing, Networking and Information. Resources policy; and sub-policies under this policy set. Additionally, all Gateway policies regarding the appropriate use of Gateway resources and responsible personal conduct apply to your use of Gateway computing and networking resources and information systems.

Digital Courtesy Statement:

Many students like to record lectures but it is important to obtain the instructor's permission before doing so. If you obtain permission to record, you should do so in an unobtrusive manner to avoid distracting your classmates. Copyrighted material cannot be recorded, eg videotapes, etc.

If you carry a cell phone to class, silence or turn it off for the duration of the class. Refrain from reading and composing text messages during class. This is especially critical during tests.

Federal Family Educational Rights & Privacy Act (FERPA):

Gateway Technical College complies with the provisions of FERPA. Prior written consent from a student must be obtained before information may be disclosed by Gateway Technical College to third parties, unless the information or the individual or group making the request is exempted by the policy

and the Family Educational Rights and Privacy Act of 1974.

Pregnant and Parenting Students:

Gateway Technical College does not discriminate against any student on the basis of pregnancy or related conditions. Pregnant and parenting students are eligible for protection and accommodation under Title IX.

Sexual Misconduct (Title IX) and Discrimination:

Gateway Technical College seeks to provide an environment that promotes equal opportunity free from discrimination and harassment. If you have been a victim of sexual harassment, sexual misconduct, sexual assault, or any other form of protected class discrimination, we encourage you to make a report.

Student Code of Conduct:

The Gateway District believes every student has the right to pursue an education free from disruption, harassment, illegal activities, threats, or danger. The District further believes that academic honesty and integrity are fundamental to the educational mission of this College. Every student is expected to comply with the standards set and to be familiar with all the rules, regulations, and policies of Gateway Technical College.

Student Due Process Rights:

The Gateway District believes that students need a process to address academic concerns (i.e. grades, classroom policies) and bring their issues to the faculty and administration's attention. These procedures are intended to afford students, faculty, and the College fair and equal treatment. The student may seek guidance from a Student Services counselor who will assist the student in understanding the process. All complaints must be filed within one (1) year of occurrence.

Student Religious Accommodations Policy:

In compliance with Wisconsin Administrative Code, Gateway Technical College will make reasonable accommodation of a student's religious beliefs. A student may request reasonable accommodation from his/her instructor with regard to examinations and other academic requirements.

Tobacco Policy:

This policy is applicable and extends coverage to all Gateway Technical College Campuses, Centers, and grounds with no exceptions at any time (24/7). A tobacco-free/smoke-free workplace will increase quality of life for employees, decrease absenteeism, and saves on other health-related personnel costs.

College Resources

Care Team:

This multi-disciplinary team of leaders from across the college focuses on intervening in situations involving both students and staff who are experiencing distress, or engaging in harmful or disruptive

behavior. The CARE team meets regularly and reviews all CARE team reports submitted.

IDEA Course Evaluations:

Gateway is focused on the quality of your education. Course evaluations help instructors identify what is working in class and look for opportunities for improvement. Student feedback is valued and helps Gateway ensure you are receiving the highest quality education. You may be asked to complete an evaluation for one or more of your courses each semester. Completing your course evaluations is quick and can be done anytime online.

Pandemic Emergencies:

Should there be a public health pandemic emergency, and school is closed for any length of time, this course will continue to be taught via Internet/Blackboard unless you are notified by the school or your instructor.

Support and Disabilities Service:

Gateway's Learning Success team is here to help you succeed during your time at Gateway. We aim to empower you to do your best by offering a wide variety of no-cost academic assistance and support services.

Wisconsin TechConnect:

Is an online job and internship search tool that connects you and your skills with thousands of Wisconsin employers who need them. This free resource is designed for degree-seeking students and graduates.

Instructions for setting up an account.

This course syllabus was created/revised [Date] and is subject to change at the instructor's discretion. All changes will be announced in Blackboard.