

CASPER COLLEGE COURSE SYLLABUS
ELTR 2815 Programmable Logic Controllers

Semester/Year: Fall 2015

Lecture Hours: 2

Lab Hours: 4

Credit Hours: 4

Class Time: Lec: Moodle

Lab: 1:00-4:50 p.m **Days:** Thursday

Room: GW 216

Lab: 6:00-9:50 p.m **Days:** Wednesday

Room: GW 216

Instructor's Name: Megan Graham

Instructor's Contact Information: Office: GW 116D

Office Phone: 268-2539

Email: mgraham@caspercollege.edu

Office Hours: M, T, W, TH 12:00-1:00 p.m. T, W 5:00– 6:00 p.m.

Course Description:

Assembly, programming and troubleshooting Programmable Logic Controllers in industrial processes. The course will include variable frequency drives, robotics and data communications.

Statement of Prerequisites:

ELTR 1515 or 1570 or permission of the instructor.

Institutional Outcomes:

- Demonstrate effective oral and written communication
- Use the scientific method
- Solve problems using critical thinking and creativity
- Demonstrate knowledge of diverse cultures and historical perspectives
- Appreciate aesthetic and creative activities
- Use appropriate technology and information to conduct research
- Describe the value of personal, civic, and social responsibilities
- Use quantitative analytical skills to evaluate and process numerical data

Program Goals:

1. To provide comprehensive training in the fields of electronics technology, so that the associate degree graduate is technically qualified to obtain employment in the electronics industries or an allied field.
2. To provide the necessary training for graduates to continue on to advanced training in an electronics program or a related four-year program.

Course Goals:

The student will be familiar with the hardware and programming of the Allen Bradley PLC type Controllers as they are used in an industrial process.

Program Objectives:

The student will be able to

- identify the components of a PLC (Programmable Logic Controller)
- physically connect and program the PLC to recognize the various modules.
- set-up data communications between PLC and a PC.
- interface inputs and outputs to the PLC (to include VFD and an HMI)
- write simple ladder logic programs using bits, counters, timers.
- describe the actions in a ladder logic program.
- troubleshoot hardware problems with the PLC system.
- identify and troubleshoot problems in a ladder logic program

Methodology:

The lecture class materials are available on Moodle. Audio presentations, class notes, homework and labs can be found on Moodle. Students are required to view the materials before coming to the class session. The laboratory class meets on campus either Wednesday evenings or Thursday afternoons. The lecture materials will present information about programmable logic controllers and topics pertaining to industrial processes. The laboratory sessions will include demonstrations and hands-on activities. Lab reports will be required for each project. There will be three practical exams.

Students may need to complete lab assignments outside of the normally scheduled lab time.

Evaluation Criteria:

Quizzes and Homework:	10%
Lab Reports:	30%
Exams:	40%
Final:	20%

 Total: 100%

Required Text, Readings, and Materials: None

Class Policies: Last Date to Change to Audit Status or to Withdraw with a W Grade:

November 12, 2015

Student Rights and Responsibilities: Please refer to the Casper College Student Conduct and Judicial Code for information concerning your rights and responsibilities as a Casper College Student.

Chain of Command: If you have any problems with this class, you should first contact the instructor to attempt to solve the problem. If you are not satisfied with the solution offered by the instructor, you should then take the matter through the appropriate chain of command starting with the Department Head/Program Director, the Dean, and lastly the Vice President for Academic Affairs.

Academic Dishonesty: (Cheating & Plagiarism) Casper College demands intellectual honesty. Proven plagiarism or any form of dishonesty associated with the academic process can result in the offender failing the course in which the offense was committed or expulsion from school. See the Casper College Student Code of Conduct for more information on this topic.

Official Means of Communication: Casper College faculty and staff will employ the student's assigned Casper College email account as a primary method of communication. Students are responsible to check their account regularly. This is also, where you will find course evaluation links during course evaluation periods.

ADA Accommodations Policy: If you need academic accommodations because of a disability, please inform me as soon as possible. See me privately after class, or during my office hours. To request academic accommodations, students must first consult with the college's Disability Services Counselor located in the Gateway Building, Room 344, (307) 268-2557, bheuer@caspercollege.edu. The Disability Services Counselor is responsible for reviewing documentation provided by students requesting accommodations, determining eligibility for accommodations, and helping students request and use appropriate accommodations.

Safety: Personal and equipment safety standards will be strictly enforced. It is the individual's responsibility to develop a safe work attitude.

Calendar or schedule indicating course content:

Week	Lecture	Lab
Wk 1	Introduction to PLC's	EX 1: Hardware
Wk 2	Hardware Basics Trainer Hardware	EX 2: Hardware Testing HW 1
Wk 3	<i>Test 1: Hardware Basics and Wiring</i>	
Wk 4	Relay Logic	EX 3: RS Logix Tutorial I HW 2
Wk 5	PLC Logic	EX 4: RS Logix Tutorial II HW 3
Wk 6	PLC Instructions I	EX 5: PLC Program 1
Wk 7	PLC Instructions II	EX 6: PLC Program 2
Wk 8	PLC Instructions III Ethernet Connections	EX 7: PLC Program 3 HW 4
Wk 9		EX 7: PLC Program 3 EX 8: Communications
Wk 10	<i>Test 2: PLC Programming</i>	
Wk 11	Advanced Communications	EX 9: PanelView
Wk 12	Subroutines	EX 10: VFD and Subroutines
Wk 13	Tasks	EX 10: VFD and PanelView
Wk 14	<i>Thanksgiving Holiday</i>	<i>Thanksgiving Holiday</i>
Wk 15	Troubleshooting Software and Hardware Problems	EX 11: PLC Troubleshooting
Wk 16	Troubleshooting Software and Hardware Problems	EX 12: Siemens PLC
Final	<i>Test 3: Troubleshooting</i>	