INSTRUCTOR'S COURSE REQUIREMENTS

PO Box 1189
1042 W. Hamlet Avenue Hamlet, NC 28345
(910) 410-1700
www.richmondcc.edu

COURSE: **ELN 260** **PROGRAMMABLE LOGIC CONTROLLERS**

SEMESTER & YEAR: FALL 2017

INSTRUCTOR'S NAME	SECTION #	CLASS MEETING TIME	OFFICE HOURS AND OTHER CONTACT INFORMATION
Amir Niczad	02	T TH 12:25-03:15PM	Office Hours: M W 11:20-12:00, 01:00-01:20 TTH 11:20-12:20, 3:20-04:00 Office: Forte :315 Office Phone: 910-410-1872 Email Address: asniczad@richmondcc.edu

METHODS OF INSTRUCTION AND EVALUATION:

STUDENT LEARNING OUTCOMES	METHODS OF INSTRUCTION	SUCCESSFUL PERFORMANCE/BEHAVIORAL INDICATORS	METHODS OF EVALUATION
1. Discuss PLC and control system components.	▪ Lecture ▪ Lab	▪ Identify the four major components of a typical PLC and describe the function of each.	▪ Exam ▪ Lab performances

STUDENT LEARNING OUTCOMES	METHODS OF INSTRUCTION	SUCCESSFUL PERFORMANCE/BEHAVIORAL INDICATORS	METHODS OF EVALUATION
2. Analyze Relay Logic Diagram.	▪ Lecture ▪ Lab	• Identify a wiring diagram. • Identify the parts of a wiring diagram. • Convert a wiring diagram to ladder diagram. • List the rules that govern a ladder diagram.	▪ Exam ▪ Lab performances
3. Write PLC Programs using basic instructions.	▪ Lecture ▪ Lab	▪ Write the ladder-logic programming to create the following logic gates: inverter, AND, and OR. ▪ Write RLL using RSLINX, RSLOGIX, and LOGIXPRO software. ▪ Define a network. ▪ Explain the horizontal and vertical limits. ▪ Describe the basic programming techniques. ▪ Use basic relay type instruction to write RLL programs.	▪ Exam ▪ Lab performances
4. Use Timers and Counters instructions in PLC applications.	▪ Lecture ▪ Lab	• Describe the differences between On delay, OFF delay, and retentive timer. • Write program using On delay, OFF delay, and retentive timer. • Explain how to extend the time range of timers by cascading. • Write program using up and down counters.	▪ Exam ▪ Lab performances
5. Describe the I/O section of PLC.	▪ Lecture ▪ Lab	▪ Describe how basic AC and DC input and output modules work. ▪ Discuss the difference between analog and discrete input output modules. ▪ Define optical isolation and describe why it is used.	▪ Exam ▪ Lab performances
6. Describe the proper wiring connections for input and output devices and their corresponding modules.	▪ Lecture ▪ Lab	▪ Describe the proper wiring connections for digital input and output devices and their corresponding modules. ▪ Explain why a hard-wired emergency-stop	▪ Exam ▪ Lab performances

STUDENT LEARNING OUTCOMES	METHODS OF INSTRUCTION	SUCCESSFUL PERFORMANCE/BEHAVIORAL INDICATORS	METHODS OF EVALUATION
		function is desirable. ▪ Define the term interposing. ▪ Describe what I/O shielding does. ▪ List environmental concerns when installing PLCs. ▪ Discuss the Electrical noise and proper grounding.	
7. Use Math instructions in PLC applications.	▪ Lecture ▪ Lab	▪ Use the basic data manipulation instructions in a simple RLL program. ▪ Use the basic Math instructions in a simple RLL program.	▪ Exam ▪ Lab performances
8. Use Compare, Jump and MCR instructions in PLC applications.	▪ Lecture ▪ Lab	▪ Write program using latching relay, MCR. ▪ Write a program using the jump, label, subroutine, and temporary end instructions. ▪ Explain the importance of safety circuits.	▪ Exam ▪ Lab performances
9. Use Sequencer instructions in PLC applications.	▪ Lecture ▪ Lab	▪ Explain the basic word and file moves instructions. ▪ Explain the shift register and sequencer instructions.	▪ Exam ▪ Lab performances
10. Interface and program HMI	▪ Lecture ▪ Lab	▪ Build a simple HMI screen using FactoryTalk View Studio.	▪ Exam ▪ Lab performances
11. Troubleshoot and service the PLC system	▪ Lecture ▪ Lab	▪ Explain how input and output devices are tested. ▪ Use programming tools to troubleshoot PLC systems.	▪ Exam ▪ Lab performances

TENTATIVE CLASS SCHEDULE AND ASSIGNMENTS:
  A. Programmable Logic Controllers overview
  B. PLC Hardware components
  C. PLC installation
  D. Logic gate functions in PLCs
  E. Basic PLC programming

F. Developing fundamental PLC wiring diagram and ladder logic programs
* First test
G. Timers
H. Counters
I. PLC Compare, Jump, and MCR
* Second test
J. Data handling instructions
k. Program Control Instruction.
L. Operator Interface Terminals
L. Troubleshooting
* Third test
** Final test

Policies and Important Information

1. **Instructor:** Amir Niczad
2. **Email: asniczad@richmondcc.edu**

3. **Attendance for ELN 260**

Promptness and regular class attendance are expected of all students. An absence, excused or unexcused, does not relieve the student of any course requirement. Attendance is required and punctuality is expected! A student is responsible for all the work, including tests, quizzes, lab work and any other assignments, of all class meetings. Following are the guidelines used by RCC Engineering department regarding students' attendance.

1	Missing a test or a quiz (Unexcused absence)	Student will receive a grade of zero
2	Missing more than 10% of classes. (Unexcused absence)	Student's average grade will be dropped by 5 points.
3	Missing more than 3 labs	Student will receive an incomplete
4	Tardy	Miss more than 10 minutes of class or lab

		time
5	Three tardy accounts	Equals one absence

4. **Grading Scale:** The final grade will be based on the following criteria:

The final grade will be based on the following criteria:

Three exams	37.5%	(300 Points)
Labs.................................	25%	(200 Points)
Final test	25%	(200 Points)
Quiz	12.5%	(100 Points)
	100%	**800 Points**

5. **Withdrawal:** If you are going to drop one or more classes, you should follow the school's procedure. See a counselor or your instructor and obtain a drop form. This form should be signed by your instructor and returned to Student Development. You may also withdraw over the telephone by calling Student Development.

6. **Responsibility for Work:** The student is responsible for all material, assignments, and announcements in class. If you miss class, you should get class notes and assignments from another student or contact the instructor.

7. **Discipline Policy:** The school has a discipline policy which will be enforced. Under it, the college has the right to decline admission, to reprimand, to place on probation, to suspend, to expel, or to require the withdrawal of a student for just cause when it is deemed in the best interest of the college. A list of offenses is found in the College Catalog.

8. **Grievance Procedure:** If you have a complaint, try to work it out with the instructor. If this is not possible, talk to the Dean of the engineering department. If the issue still cannot be resolved, then talk to the Vice-President for Instruction.

9. **Other Notes:** It is against school policy for children to accompany adults to class. It is against school policy to have food or drinks in classrooms.

10. **Final Exam:** The final exam for this course is scheduled for **Last Day of Class.**
Note: If the college is closed during any of the exam days, the exam schedule will resume on the next day the college is open, completing the remaining exams.

11. **Academic Freedom:** Students' rights to express dissenting opinions from that held by the instructor are upheld. No student will be penalized for disagreeing with the instructor's opinion. However, students should know the difference between opinion and fact, as factual information is not subject to debate.

12. **Internet Use in the Classroom:** Connecting classrooms to the Internet and college computing resources opens immense possibilities for learning—but it also opens the risk of **losing student attention** to e-mail, instant messaging, web surfing, MP3 downloads, and even network hacking. Due to the increasing demands in technology and education, the internet is deemed necessary but should not be abused or accessed while in the classroom for these purposes. While in the classroom, Internet access is **prohibited while the instructor is lecturing** or when the class in involved in classroom exercises that do not include the internet. Internet activity will only be permitted when authorized by the instructor. There are **NO** exceptions to this classroom Policy.

13. **Makeup Tests:**
When students have missed a test, the student may be allowed to make up the test **ONLY** if the instructor permits. Otherwise **ALL** test should be taken at the appropriated times.

14. **Cell Phones and Electronic Devices:** Classroom disruption by cell phones or other electronic devices is prohibited. All cell phones and similar electronic devices must remain turned off and out of sight for the duration of class. This includes headphones and Bluetooth devices. Personal Laptops, Net-books, I-pads, etc. are also prohibited without prior permission from your instructor. **If a student violates this policy, they will be asked to leave the classroom and be**

counted absent for the remainder of the class period or surrender their cell phone to the instructor for the remainder of the class. If a cell phone or an electronic device is used for cheating during a test, a student will be given a zero and given a failing grade for the class. Cheating at RCC is not tolerated and may result in further disciplinary action. Exceptions to this policy, needs prior approval from the instructor before the class starts.

15. **Classroom and Campus Security requirements: Student IDs:** It is **required** that Student IDs be worn at **ALL** times while on Campus. All IDs must be clearly displayed on the front of an individual. Failure to display your Student ID on an ongoing basis will be Reported to the VP of Student Development and may result in disciplinary action.
Classroom Doors: The door will remain **locked** at all times while class is in session. (This is according to college policy.)

16. **RCC's Dress Code**
Appearance: You are expected to dress appropriately for the classroom environment. Sagging pants, clothing/jewelry with drug related signs, low cut tops, see through garments, too-short shorts, short skirts, leggings worn alone, halter tops, short midriff tops are not acceptable. No hats or head gear are allowed in the classroom. No gang affiliation is to be displayed. The instructor will notify any student if he/she is inappropriately dressed. If a student is found in violation of the above dress code, the garment error will be immediately corrected and the student can remain in class; or the student will be sent home to correct the garment error; or failure to comply with garment error will result in the student being referred to the Discipline Committee.

17. **Contacting Instructor**
I am normally available during my posted office hours. I am available at other times if needed. The best way to contact me, by far, is e-mail or phone. Regardless of contact method, I return messages no later than one business day except under extenuating circumstances. If you are having a problem with your instructor you may discuss the issue with my immediate supervisor Dr. Devon Hall, Dean of Applied Sciences & Engineering. Dr. Hall's office is located in the Lee building room 059. Dr. Hall can also be reached by telephone at (910) 410-1912 or by email at dghall@richmondcc.edu