



INSTRUCTOR'S COURSE REQUIREMENTS

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

COURSE: **ATR 112** **INTRODUCTION TO AUTOMATION**

SEMESTER & YEAR: **SPRING 2017**

INSTRUCTOR'S NAME	SECTION #	CLASS MEETING TIME	OFFICE HOURS AND OTHER CONTACT INFORMATION
Amir Niczad	01	MW 09:50-12:10P	Forte 315 T TH 9:00 – 12:00 Phone: 910.410.1872 Email: asniczad@richmondcc.edu

METHODS OF INSTRUCTION AND EVALUATION:

STUDENT LEARNING OUTCOMES	METHODS OF INSTRUCTION	SUCCESSFUL PERFORMANCE/BEHAVIORAL INDICATORS	METHODS OF EVALUATION
1. Describe the basic anatomy and attributes of an industrial robot	<ul style="list-style-type: none"> ▪ Lecture ▪ Power point presentation 	<ul style="list-style-type: none"> ▪ Discuss benefits of using robots in automation cells ▪ Identify the Cartesian, Cylindrical, Spherical, jointed arm and SCARA robots. ▪ Discuss robot's classification in terms of types of motions and pathways. ▪ Describe the terminologies related to the field of industrial robotics. 	<ul style="list-style-type: none"> ▪ Exam
2. Explain the difference between basic hydraulic and pneumatic systems.	<ul style="list-style-type: none"> ▪ Lecture ▪ Power point presentation ▪ Lab 	<ul style="list-style-type: none"> ▪ Discuss the basic principles of hydraulic and pneumatic systems. ▪ Use hydraulic and pneumatic systems in automation. ▪ Identify and use components in hydraulic and 	<ul style="list-style-type: none"> ▪ Exam

STUDENT LEARNING OUTCOMES	METHODS OF INSTRUCTION	SUCCESSFUL PERFORMANCE/BEHAVIORAL INDICATORS	METHODS OF EVALUATION
		pneumatic systems. <ul style="list-style-type: none"> ▪ Explain the advantages and disadvantages of hydraulic and pneumatic systems. 	
2. Explain the use of electrical motors and mechanical drives in automation applications.	<ul style="list-style-type: none"> ▪ Lecture ▪ Power point presentation ▪ Lab 	<ul style="list-style-type: none"> ▪ Explain the differences between the DC and ac motors. ▪ Explain the differences between the servo and non-servo motors. 	<ul style="list-style-type: none"> ▪ Exam ▪ Lab performances
3. Discuss the Servo and non-servo systems.	<ul style="list-style-type: none"> ▪ Lecture ▪ Power point presentation 	<ul style="list-style-type: none"> ▪ Explain the differences between ON-OFF, Proportional, proportional plus Integral, proportional plus derivative, and PID controls. 	<ul style="list-style-type: none"> ▪ Exam
4. Describe the basic function of a sensor in an automated system	<ul style="list-style-type: none"> ▪ Lecture ▪ Power point presentation ▪ Lab 	<ul style="list-style-type: none"> ▪ Identify and use the incremental and absolute optical encoders. ▪ Identify and use of micro switches, Inductive and capacitive proximity switches ▪ Identify and use Photodiode, phototransistor, photovoltaic, and photo detectors. ▪ Use vision system (Cognex) for inspection. 	<ul style="list-style-type: none"> ▪ Exam ▪ Lab performances ▪ Project report
5. Program industrial robot for basic operation.	<ul style="list-style-type: none"> ▪ Lecture ▪ Power point presentation ▪ Lab 	<ul style="list-style-type: none"> ▪ Operate and program Motoman, ABB (IRB2400, and IRB1200) and adept robots. 	<ul style="list-style-type: none"> ▪ Exam ▪ Lab performances ▪ Project report
6. Use the PLC to automate a simple manufacturing process.	<ul style="list-style-type: none"> ▪ Lecture ▪ Power point presentation ▪ Lab 	<ul style="list-style-type: none"> ▪ Use the PLC to automate the Load Bearing Assembly Line (SMC System) 	<ul style="list-style-type: none"> ▪ Exam ▪ Lab performances ▪ Project report
8. Demonstrate strong communication, teamwork and leadership skills.	<ul style="list-style-type: none"> ▪ Lecture 	<ul style="list-style-type: none"> • Attend meetings and arrives promptly • Complete individual tasks promptly • Gather information as appropriate • Accomplish a fair share of the work • Express him/herself clearly 	<ul style="list-style-type: none"> ▪ Project report

STUDENT LEARNING OUTCOMES	METHODS OF INSTRUCTION	SUCCESSFUL PERFORMANCE/BEHAVIORAL INDICATORS	METHODS OF EVALUATION
		<ul style="list-style-type: none"> • Introduce new ideas • Share opinions and knowledge • Listen to views and opinions of others • Consider the suggestions of others • Provide help to others • Write the final report • Present the project using power point or website. 	

TENTATIVE CLASS SCHEDULE AND ASSIGNMENTS:

- A. Introduction to S7 PLC
- B. Programming S7 PLC
- C. Introduction to industrial robots
- D. Robot classifications
 - * **First test**
- E. End of arm tooling.
- F. Hydraulic and Pneumatic systems
- G. Motors and Drives
- H. Automation sensors
- I. Controls
 - ** **Second test**
- J. Interfacing
- K. Robot programming
- L. Computer-integrated manufacturing with robots.
- M. Vision system
- N. System integration using PLCs.
 - *** **Third test**
 - Final test**

Academic Calendar

Materials Flash drive
 Scientific calculator
 Notebook/loose-leaf paper/typing paper
 Blue or black pens

Policies and Important Information

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

3. **Attendance:**

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

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Three exams	33%	(300 Points)
Labs.....	11%	(100 Points)
Final test	22%	(200 Points)
Projects.....	22%	(200 Points)
Quiz	<u>12%</u>	<u>(100 Points)</u>
	100%	900 Points

A (90-100), B (80-89), C (70-79), D (60-69), and F (59 and below).

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 department chair. If you can't work out the problem with the department chair, talk to the division chair for the 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 is 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. **Late Work:** Assignments submitted late will be assessed a penalty of **-5 points** per school day late. Monday-Friday is counted 1 day each (weekends are counted as one day). The late penalty policy does **NOT** apply to the final term project, simply because late final projects will **NOT** be accepted due to end-of-the-semester grading constraints.

14. **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.

15. 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.

16. 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 on going 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.)

17. 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.

18. 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 1 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