INSTRUCTOR'S COURSE REQUIREMENTS

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

COURSE: **ELN 232**   **INTRODUCTION TO MICROPROCESSORS**

SEMESTER & YEAR: FALL 2017

INSTRUCTOR'S NAME	SECTION #	CLASS MEETING TIME	OFFICE HOURS AND OTHER CONTACT INFORMATION
Amir Niczad	01	M W 08:25-11:15 AM	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 internal architecture of microprocessors and microcontrollers.	▪ Lecture ▪ Lab	▪ Describe the fundamental elements of every computer system and compare them with microcontroller's basic elements. ▪ Describe the use of buses to connect computer elements. ▪ Compare and contrast various memory	▪ Exam ▪ Lab performances

STUDENT LEARNING OUTCOMES	METHODS OF INSTRUCTION	SUCCESSFUL PERFORMANCE/BEHAVIORAL INDICATORS	METHODS OF EVALUATION
		types. ▪ Illustrate the typical registers inside the processor.	
2. Discuss the addressing modes, Memory map, and the I/O units in 68HC11 microcontrollers.	▪ Lecture ▪ Lab	• Explain the purpose of memory addressing modes. • Define the Op-Code and operand as they applied to 68HC11. • Explain the memory addressing modes that are available on the HC11.	▪ Exam ▪ Lab performances
3. Discuss the differences between low level, mid level and high level languages.	▪ Lecture ▪ Lab	▪ Describe the difference between the source code and machine code. ▪ Describe the differences between the machine language, assembly language, intermediate language, and high- level language. ▪ Use flowcharts to show the flow/function of a program.	▪ Exam ▪ Lab performances
4. Write program using assembly language for various process control applications.	▪ Lecture ▪ Lab	• Define 68HC11 registers. • Write simple programs using load and store instructions. • Perform arithmetic and logic operations using Varity of arithmetic and logic instructions. • Write short programs using different addressing mode in 68HC11 controller. • Use branch and jump instruction in short programs. • Make a simple time delay using a counter in a finite program loop. • Calculate the effective address for an indexed mode instruction.	▪ Exam ▪ Lab performances

STUDENT LEARNING OUTCOMES	METHODS OF INSTRUCTION	SUCCESSFUL PERFORMANCE/BEHAVIORAL INDICATORS	METHODS OF EVALUATION
5. Use subroutine and Interrupt service routine programs for various process control applications.	▪ Lecture ▪ Lab	▪ Use push and pull instructions to move data to and from the stack. ▪ Write simple subroutine program. ▪ Write simple interrupt service routine program. ▪ Enable and mask interrupts via global and local control bits.	▪ Exam ▪ Lab performances
6. Discuss stacks, interrupts, internal timers, input capture and output compare in 68HC11 microcontrollers.	▪ Lecture ▪ Lab	▪ Describe how parameters are passed to subroutines. ▪ Describe the process of servicing an interrupt. ▪ Write simple programs using 68HC11 main timer and real time interrupt timer. ▪ Describe the function of input capture and output compare.	▪ Exam ▪ Lab performances
7. Download, test, and troubleshoot programs for various process control applications.	▪ Lecture ▪ Lab	▪ Use the 68HC11A0 board and the THRSim11 software to write, download, and test various control programs.	▪ Exam ▪ Lab performances
8. Program the I/O ports for various process control applications.	▪ Lecture ▪ Lab	▪ Use the I/O ports available in 68HC11 to write programs to collect data from the input devices and send output signals to output devices.	▪ Exam ▪ Lab performances
9. Discuss the bus concepts, microcontroller hardware, and interfacing concepts.	▪ Lecture ▪ Lab	▪ Discuss the 68HC11 processors mode. ▪ Describe the differences between the address and data and explain how they are used. ▪ Demonstrate the concepts of address decoding.	▪ Lab performances
10. Discuss the use and the impact of modern engineering tools, equipment, techniques and solutions in a global context.	▪ Lecture	▪ Discuss the opportunities and challenges for U.S. CPU and microcontroller manufacturers in global market.	▪ Research paper

TENTATIVE CLASS SCHEDULE AND ASSIGNMENTS:

A. Introduction to microprocessors
B. MC68HCII----Architecture and Addressing Modes
C. MC68HC11 Instruction set
** First test
D. Introduction to programming
E. General purpose I/O
F. Microcontroller Hardware
** Second test
G. HC11 Interrupts and time events
H. Serial communication
** Third test
*** Final Test

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

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

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  Three exams ........................33%    (300 Points)
Labs.....................................  22%    (200 Points)
Final test ............................  22%    (200 Points)
Project  ………………………  11.5%  (100 points)
Quiz ................................. .  11.5%  (100 Points)
                                    100%      900 Points
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93-100 (A), 85-92 (B), 78-84 (C), 70-77 (D), below 70 (F).

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 t 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 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.)

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 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