

University of Rhode Island
ELE208/209: Introduction to Computing Systems
Spring 2013

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Course Web Page: <http://www.ele.uri.edu/courses/ele208>

Time and Location

Lecture: Mon and Wed, 10:00 am - 10:50 am, Kelley Hall 102
Lab: Section 1: Mon, 2:00 pm - 4:45 pm, Kirk 212
Section 2: Wed, 2:00 pm - 4:45 pm, Kirk 212

Required Text

1. *Introduction to Computing Systems: From Bits & Gates to C & Beyond, Second Edition*, Yale N. Patt and Sanjay J. Patel, McGraw-Hill, 2004. ISBN 978-0-07-246750-5.
2. *Guide to Using the Unix Version of the LC-3 Simulator*, Kathy Buchheit, 2003. Available free online at http://highered.mcgraw-hill.com/sites/dl/free/0072467509/104652/LC3_unix.pdf

Prerequisites: credit or concurrent enrollment in ELE 209 and MTH 141

Course Objective

Most introductory computer courses focus on high-level language programming. They typically take an “information hiding” approach that abstracts away all of the interesting details of the underlying computer system. While this type of abstraction can be a very useful technique for enhancing productivity, it is most helpful after you understand the fundamental concepts of a computing system. Without this fundamental knowledge, the information hiding approach actually inhibits understanding. You are too often left wondering how everything fits together, which leads to rote memorization instead of real comprehension.

In contrast to this highly abstract, top-down approach, this course presents a bottom-up view that addresses a broad foundation of topics in computing systems. This more concrete view helps eliminate the mystery about how a computer actually works by tying every new concept to a frequently developing foundation. As a result, nothing in the computer system appears to happen magically. This course will introduce:

- Bits and Bytes: How do we represent information using electrical signals?
- Digital Logic: How do we build circuits to process information?
- Processor and Instruction Set: How do we build a processor out of logic elements?
- Assembly Language Programming: How do we use processor instructions to implement algorithms?
- I/O, Traps, and Interrupts: How does the processor communicate with the outside world?
- C Programming: How do we write programs in C?

Grading

ELE 208:	Homework / Quizzes	25%	ELE 209:	In-Lab Quizzes	30%
	Exam 1	20%		Lab Assignments	70%
	Exam 2	20%			
	Final	35%			

Any questions regarding grading must be brought to the attention of the TA or the instructor within 1 week after the item in question is returned.

Exams

There will be two mid-term exams and a final exam, the dates of which are given on page 3 of this syllabus. All exams will be open-book, but no notes, papers or electronic devices will be allowed. The final exam will be comprehensive, covering all the material presented during the semester. There is no make-up for missed exams, except in cases of illness (a physician's note will be required) or family emergency, and these makeup exams may be different than that given in class.

Homework

Homework will be assigned frequently and provides the best way of keeping up with the course material. Expect to see similar questions in midterm exams and the final! Homework should be **hand written** and handed in during the lecture on the date it is due. Late homework will not be accepted, as the solutions will be posted right after the submission deadline. As long as a reasonable attempt has been made on all of the problems, full credit will be given for the assignment. It is okay to work in groups on the homework, but each student must submit their own hand written solutions.

Quizzes

During the class that a homework assignment is due, there may be an unannounced quiz based on the material from that assignment. You will be allowed to reference your homework solutions during the quiz, but books, notes, and electronic devices will not be allowed. These quizzes will be worth the equivalent of three homework assignments.

Labs

All labs are due at the time indicated in the assignment description. Late assignments will receive a reduction of 15% of the maximum possible score for each day they are late. You will be evaluated individually to determine your final course grade. However, you are encouraged to work in groups of two on the lab assignments. Everyone who works together on the same assignment will receive the same grade for that assignment.

In-Lab Quizzes

There will be three in-lab quizzes, the dates of which are given on page 3 of this syllabus. These will be done individually.

Academic Integrity

Cheating and plagiarism will be handled according to the University Manual section 8.27.10 through 8.27.21 (see <http://www.uri.edu/facsen/8.20-8.27.html>). The penalty for cheating or plagiarism can range from a zero score on the assignment to a failing grade for the course.

Accommodations

Any student with a documented disability should contact me early in the semester so that we can make reasonable accommodations to support your success in this course. You should also contact Disability Services for Students, Office of Student Life, 330 Memorial Union, 874-2098.

Expected Course Outline:

Week	Topic	Reading	Lab
1. Jan 23	W: Introduction	Ch. 1	No lab
2. Jan 28 Jan 30	M: Bits, data types and arithmetic W: Arithmetic and logical ops	2.1 - 2.4 2.4 - 2.7	No lab
3. Feb 4 Feb 6	M: Ch. 2 wrap-up W: Transistors, gates, logic	2.1 - 2.7 3.1 - 3.2	Lab1: Intro to UNIX
4. Feb 11 Feb 13	M: Combinational logic, memory W: Memory, sequential logic	3.3 - 3.4 3.5 - 3.6	Lab 2: UNIX processes & shells
5. Feb 18 Feb 20	M: Ch. 3 wrap-up, Von Neumann model W: Von Neumann example: LC-3	4.1 - 4.2 4.3 - 4.5	Lab 3: Scripts & compilers Lab Quiz 1
6. Feb 25 Feb 27	M: Review W: EXAM 1	Ch. 1 - 4 Exam: 1 - 4	Lab 4: LC-3 Simulator
7. Mar 4 Mar 6	M: LC-3 computer W: Memory and control instructions	5.1 - 5.3 5.3 - 5.6	Lab 5: Programming the LC-3
8. Mar 11 Mar 13	M: Spring Break - NO CLASS W: Spring Break - NO CLASS		
9. Mar 18 Mar 20	M: Assembly language W: Assembler	7.1 - 7.2 7.3 - 7.4	Lab 6: Conditional branching
10. Mar 25 Mar 27	M: I/O W: Traps, subroutines	Ch. 8 Ch. 9	Lab 7a: Assembly & debugging Lab Quiz 2
11. Apr 1 Apr 3	M: Stack W: Review	Ch. 10 Ch. 5 - 10	Lab 7b: Lab 7 part 2
12. Apr 8 Apr 10	M: EXAM 2 W: Intro. C, variables, operations	Exam: 5 - 10 Ch. 11 - 12	Lab 8: Intro. to C Programming
13. Apr 15 Apr 17	M: Control structures W: Functions	Ch. 13 Ch. 14	Lab 9: C Iterations
14. Apr 22 Apr 24	M: Pointers & Arrays W: Pointers & Arrays	Ch. 16	Lab 10: C Pointers & Arrays Lab Quiz 3
15. Apr 29	M: Review		No lab
May 6	FINAL EXAM: Monday, May 6, 8:00 am - 11:00 am, Kelley Hall 102		