

UNC - Charlotte, Department of Electrical and Computer Eng.
**Syllabus for ECGR 3183: Computer Organization and
Programming Languages – Fall 2004**

Instructor: James M. Conrad, Associate Professor of ECE

Lecture: MWF 11:00 – 11:50 Kennedy 229.

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Check the web site frequently!

Textbook



Patt/Patel, *Introduction to Computing Systems: From Bits and Gates to C and Beyond*, 2nd edition, McGraw-Hill, 2003, ISBN 0072467509. Cost: around \$50-90. Save money, buy a used book.

Catalog Description

Introduction to key concepts in computer organization. Microprocessor design, assembly language programming, C programming, input/output, interrupts and traps, structured program development, parsers/interpreters/compilers. Emphasis on application of these concepts to computer engineering systems including microcomputers and embedded systems. (Fall)

Purpose of Course

This course will provide a detailed understanding of computer systems. It introduces computer engineering topics. During this course, you will develop a basic understanding of computer system architecture; learn to program computer systems at the machine and assembly level; understand what roles are carried out by the microarchitecture, data flow and control flow portions of computers; understand how a high level language such as C is translated from text, to assembly, to machine language, to run time actions, to voltage variations in the underlying switching fabric; and, learn how simple I/O devices are controlled by microprocessors.

Students will:

1. Develop a basic understanding of computer system architecture,
2. Learn to program computer systems at the machine and assembly level,
3. Understand what roles are carried out by the microarchitecture, data flow and control flow portions of computers,
4. Understand how a high level language such as C is translated from text, to assembly, to machine language, to run time actions, to voltage variations in the underlying switching fabric, and

5. Learn how simple I/O devices are controlled by microprocessors.

Labs

A moderate amount of time and thought will be required in the labs. Because almost all of us learn by doing, the laboratory will probably be the most effective method for learning the material, and will help you on homework and exams. It is important that you participate fully in the lab-- do not just let your partner do all the work. (If you do, you will be unprepared for the tests!) Also, ask yourself questions while preparing for the lab and during the lab. Do not just passively and monotonously follow the lab write-up-- ask some of your own questions and then find out the answers with your computer. To learn, you need to do it and you need to creatively think about what you are doing! Lab grades will be based on lab exercise demonstrations and lab write-ups.

Labs will be assigned on Fridays and due the next Friday. Class time will be given for completing labs and demonstrating, however you should spend time during the week to try and complete the labs. The LC-3 tools are located in the Mosaic XP tools (under Electrical).

Homework

Homework is another example of learning by doing. Although not as exciting as a lab, homework is essential to learning the concepts in this course. Homework will be in the form of reading assignments and problem sets, with a due date 2-3 lectures after it is assigned. **No late homework will be accepted.** Homework must be turned in at **the beginning of lecture (before I begin lecturing)**. Homework must be done individually (you will learn the most from this). Any evidence of group participation will be interpreted as academic dishonesty. There will be 10-13 assignments, of which the highest 10 will be used in your final grade. Here are some guidelines for homework assignments:

- You will typically get better grades on homework if they are typed
- Do not repeat the question on the homework sheet.
- Do not put a printout of the assignment sheet anywhere in your turned-in homework.
- Staple all pages together
- Do not fold the assignment when you turn it in.
- Hand in a hard copy of your homework
- Check the class web site for a MS Word file which is a template for homework. Replace the information in the header with your particular information.

If you have a dispute with how an assignment is graded, you should follow this procedure:

1. Get the solution to the assignment off the class web site and examine it. You may have just got the problem wrong.
2. If you really believe that your answer is correct (matches the answer given in the solution), contact the TA who graded your assignment and discuss it with them. They will listen to your concern, and act on it, at their discretion. In any case, they will sign the homework verifying that they saw it again.
3. If you are still not satisfied with the resolution, you may bring the homework to me for review. I will not review homework that has not been seen and signed by the TA.

We record all "disputed" points in a separate column. We contend that "disputed" points never add

up to a change in your final grade, and we will examine this when final grades are assigned. Note that TA addition errors should follow the above procedure, but will not be figured in the "disputed" column.

Quizzes

There will be five to seven "pop" quizzes given throughout the semester, of which the highest five will be used in your final grade. These will be to reward students who consistently show up to class, but will be more than just attendance points.

Exams

There will be two mid-semester exams and one final. **No calculators** may be used on exams. Exams are open-book, but no notes are allowed. Exams will include material from the lecture, the readings, homework, and laboratories.

Exam dates (preliminary):

- Mid-semester exam #1: Friday, September 24, regular class time and room
- Mid-semester exam #2: Wednesday, November 3, regular class time and room
- Final exam: Monday, December 13, 12-3 p.m.

Missed exams: Attendance at all exams is mandatory. Only legal or debilitating medical excuses will be accepted (read: prison time, major blood loss, etc.), provided that they are accompanied by the appropriate official documentation. Makeup exams are more difficult than the exams they replace; few have passed. Failure to satisfy these criteria will result in a zero grade for the exam.

Missing Class/Assignments

Throughout the semester, a student may miss classes/assignments/exams due to many reasons. Most of the reasons will not be accepted as an "excused" absence. That is why a few of the quizzes and homeworks are dropped when determining your final grade. Plus, you can always email your homework. For example:

Throughout the semester, a student may miss classes/assignments/quizzes/exams due to many reasons. Most of the reasons **will not** be accepted as an "excused" absence. For example:

- ECGR or other class exam review sessions: All class and exam times take precedence over any review sessions.
- University sponsored activity: All class and exam times take precedence over any University-sponsored activity.
- Business trips: If you miss an assignment/quiz because you were on a business trip, you miss out on the assignment/quiz points.
- Illness: If you miss an assignment/quiz because were ill, you miss out on the assignment/quiz points.

Course Lectures

I use transparencies to teach this class. These can be downloaded and printed from the web.

Monday	Wednesday	Friday
8/23- Syllabus; Intro, Levels of Abstraction (1)	8/25 - Numbers and Two's complement; Logical Operations, Circuits (2.1-3.2)	8/27- Combinational Logic (3.3); Storage and von Neumann Model (3.4)
8/30 - Storage and von Neumann Model (3.4 - 4.2)	9/1 - Von Neumann model and LC-3 (4.2 - 5.1)	9/3 - Von Neumann model and LC-3 (4.2 - 5.1)
9/6 - <i>no class</i>	9/8 - LC-3 Instruction Set and Datapath (5.2 - 5.6)	9/10 - LC-3 Instruction Set and Datapath (5.2 - 5.6)
9/13 - Assembly Language Programming (6 - 7)	9/15- Assembly Language Programming (6 - 7)	9/17 - Assembly Language Programming Lab
9/20 - Polling I/O (8)	9/22 - Polling I/O and Interrupts (8)	9/24 - Exam 1
9/27 - Interrupts (8 & notes)	9/30 - Traps and Subroutines (9)	10/1 - Subroutines Lab
10/4 - Subroutines (9.2)	10/6 - Stacks (10)	10/8 - Stacks (10)
10/11- <i>no class</i>	10/13 - Stacks (10)	10/15 - Stacks lab
10/18 Machine-Independent Prog. (11)	10/20 - Machine-Independent Prog.	10/22 - Basic Data Storage (12.1)
10/25 - Basic Data Storage (12)	10/27 - Operators & Assignment (12)	10/29 - C programming lab
11/1 - Catch-up day	11/3 - Exam 2	11/5 - Selection/Control (13)
11/8 - Selection/Control (13)	11/10 - Iteration (13)	11/12 - Functions (14)
11/15 - Functions (14)	11/17 - Testing (15)	11/19 - C programming Lab 2
11/22 - Arrays & Pointers (16)	11/24 - <i>no class</i>	11/26 - <i>no class</i>
11/29- Arrays & Pointers (16)	12/1- Arrays & Pointers (16)	12/3 - Pointer Lab
12/6 - Structs and their uses (19)	12/8 - Structs and their uses (19)	

Grading Percentages

20% Homework
 15% Laboratory
 5% Quizzes
 15% Exam 1
 15% Exam 2
30% Final Exam
 100% Total

Academic Dishonesty

All the provisions of the University code of academic integrity apply to this course. In addition, it is my understanding and expectation that your signature on any test or assignment means that you neither gave nor received unauthorized aid.

Please read the discourse on cheating and ECGR 3183 on the web page. For homework and laboratory projects, while discussion is allowed, direct copying is not and students must turn in individual submissions. Realize that mastery of the material in the homework and lab assignments will be essential for a good performance on the exams! The only exception is that lab partners work closely on the lab assignment and turn in one lab report.

Important Semester Dates

Last day to cancel all classes (with 100% refund)	August 22, 2004
First day of classes	August 23, 2004
Deadline to pay Fall 2004 tuition and fees	August 25, 2004
Last day to drop all courses with a \$25 withdrawal fee	August 30, 2004
Last day to drop on the WEB	August 30, 2004
Last day to drop a course with no record of course (with continued enrollment) with 100% Refund (After this date a grade of "W" will be given for withdrawn courses)	August 30, 2004
Last day to register or add a course	Sept 1, 2004
Last day to change grade type (Pass/Fail or Audit)	Sept 1, 2004
Last day to withdraw from all courses with a grade of "W" and a \$75 withdrawal fee (Cannot be done using the WEB)	Sept 2, 2004
Labor Day (no classes, university closed)	Sept 6, 2004
Deadline for compliance with NC Immunization Law	Sept 22, 2004
Deadline to apply for May 2005 graduation	Oct 1, 2004
Last to withdraw from a course with grade of "W" (and retain other courses) (cannot be done using the WEB)	Oct 4, 2004
Fall Break (no classes)	Oct 11-12, 2004
Last day to withdraw from all courses with grade of "W" and receive a refund (cannot be done using the WEB)	Oct 22, 2004
Deadline to deposit doctoral dissertations with the Graduate School	Oct 29, 2004
Registration for Spring 2005 Begins (check eligibility via the WEB)	Nov 8, 2004
Deadline to withdraw from all courses with grade of "W" (cannot be done using the WEB)	Nov 23, 2004
Thanksgiving Break (no classes; university closed TH/F/S)	Nov 24-27
Last day of classes	Dec 8
Reading day	Dec 9
Final exams	Dec 10-11, 13-17
December Commencement	Dec 18