### COMP 231: Introduction to Computer Organization CRN 25282 – Spring 2015

Instructor: Catie Welsh Meetings: MWF 3-3:50pm, Ohlendorf 225 Course website: <u>http://cs.rhodes.edu/welshc/COMP231\_S15/</u> Email: welshc@rhodes.edu (please include "CS 231" somewhere in the subject) Office hours: Tues and Thurs. 2-4pm, or by appointment. Ohlendorf 422.

### **Course Description:**

This course is a bottom-up exploration of the interaction between computer hardware and software. Topics begin with an introduction to digital logic, and continue through elementary processor design, to assembly language, machine data representation, and computer arithmetic. Other topics in contemporary computer architecture such as multicore processors and GPGPU's may be discusses as time allows. Projects include hardware and simulated digital circuits as well as programs in assembly language.

#### Textbooks:

- 1. Null & Lobur, *The Essentials of Computer Organization and Architecture*, 4<sup>rd</sup> edition (Required)
- 2. Kidder, The Soul of a New Machine (Required)

**Prerequisites:** The course assumes successful completion of CS141 or significant programming experience. Please come see me if you have not had CS141.

ົດມ	rce	MO	rk
cou	rse	wu	IK.

	Tentative weight	Tentative date	
Homework Exercises, Laboratory Projects,	50%		
Programming Exercises			
Midterm 1	15%	Wednesday, February 18 <sup>th</sup> , in class	
Midterm 2	15%	Wednesday, April 1 <sup>st</sup> , in class	
Comprehensive Final exam	20%	Friday, May 8 <sup>th</sup> 5:30-8pm	
		Alternative Dates/Times:	
		Mon, May 4 <sup>th</sup> 1-3:30pm	
		Tues, May 5 <sup>th</sup> 8:30-11am	
		Wed, May 6 <sup>th</sup> , 8:30-11am	
		Note: Locations will be announced closer to final	
		exam dates.	

### Grade Assignments:

• Grading is based on the below scale:

0	A :	[93%, 100%]	0	C:	[73%, 77%)
0	A-:	[90%, 93%)	0	C-:	[70%, 73%)
0	B+:	[87%, 90%)	0	D:	[65%, 70%)
0	B:	[83%, 87%)	0	D-:	[60% <i>,</i> 65%)
0	B-:	[80%, 83%)	0	F:	[0%, 60%)
0	C+:	[77%, 80%)			

• For borderline cases, I may take into account participation, and/or attendance, and improvement during the semester. However, you should not assume that final grade averages will be rounded.

**Homework** will be assigned regularly. Be ready to hand it in at the **beginning of class** on the day it is due. Late homework will not be accepted, except according to the extension policy (see the last page of this information sheet). The homework exercises are a critically important part of this course – you need to keep up with them on a timely basis.

# Videos

A three-part video series about the history of personal computers, *Triumph of the Nerds*, will be viewed as an additional text for the course. One or two other videos which are dramatizations of some of the same events will be viewed for enrichment, enjoyment, and extra credit.

# Laboratory projects

Early in the semester there will be several laboratory exercises involving wiring up integrated circuits ("chips") to give you some hands-on experience with the concepts we will be studying in class. Normally these will require about 1 to 1 1/2 hours. With such a large class, we will have to work out a schedule for getting everyone a chance to do the labs. There is a possibility that later the entire class will do a group project in which we will create our own processor of some kind. More details will be given in class.

# Programming

Around mid-semester there will be a team programming project: you will be asked to write the microprogram for a simulated machine language interpreter. Later in the semester there may be other short programming exercises of varying kinds.

# Policy on homework collaboration

Working together with other people is a great way to learn the kind of material in this course. I encourage you to work together on the homework, if you find that it helps you to learn. However, homework for this course is also graded, as part of your final course grade. Each student must write up his or her own homework solutions. By handing in homework solutions to be graded, you are promising that you took part in solving the problems, and that you are not just copying someone else's work. Handing in homework to be graded when you did not participate in solving the problems is a violation of the Honor Code.

# **Class Conduct**

- I encourage everyone to participate in class. Raise your hand if you have a question or comment.
  Please don't be shy about this; if you are confused about something, it is likely that someone else is confused as well. Teaching and learning is a partnership between the instructor and the students, and asking questions will not only help you understand the material, it also helps me know what I'm doing right or wrong.
- The material in this class cannot be learned just by watching other people and taking notes; it is not a spectator sport. Your participation is expected and will be counted toward your grade in borderline cases.
- Do not use your cell phone for calls or texting while in class, and silence their ringers.
- If you cannot make it to class for whatever reason, make sure that you know what happened during the lecture that you missed. It is your responsibility, and nobody else's, to do so. The best way to do this is to ask a classmate.
- If you have to leave a class early, inform the instructor in advance. It is rude to walk out in the middle of a lecture.

**Students with Disabilities:** If you have a documented disability and wish to receive academic accommodations, please contact the Office of Student Disability Services at x3885 as soon as possible.

**Mutual Respect:** The Department of Mathematics & Computer Science is committed to creating an academic climate that is safe, respectful, and appreciative of all students, staff, and faculty regardless of race, ethnicity, physical ability, mental ability, or any other aspect of one's identity. A climate of mutual respect allows us to ask difficult questions and to participate in honest discussions, even in the context of strong disagreement. Creating this kind of open, honest, and respectful climate is our mutual responsibility.

# Make-up Exams and Extensions on Assignments

Extensions on the due dates of assignments and individual re-scheduling of exams will be granted only for the following reasons:

- Serious and verifiable illness or medical emergency
- Participation in an official Rhodes College activity (e.g., course field trip, sports team travel)
- Religious holidays
- Major life event (such as birth, wedding, death) your own or a close family member
- Other genuine emergency that is beyond your control

Notice that this is an extensive list. It does not, however, include situations in which the timing of an exam or assignment is simply inconvenient for you. In particular, there will be no accommodation for ordinary travel arrangements before or after college breaks.

If you wish to request an extension or re-scheduling because of a situation which can be known ahead of time, it is your responsibility to <u>make arrangements in advance</u>. Permission might not be given after the fact. You may be asked to make your request in writing.

In all cases, your instructor is the final judge of whether an accommodation is warranted.

I reserve the right to alter this syllabus as necessary.