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Fall 9-1-2000

### CS 231.01: Computer Architecture and Assembly Language Programming I

Petr Votava

*The University of Montana*

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# CS 231, Fall Y2K

## Computer Architecture and Assembly Language Programming I

**Instructor:** Petr Votava  
**E-mail:** votavap@cs.umt.edu  
**Phone:** 243-5605  
**Office:** Social Science 404  
**Office Hours:** MWF 9:00 – 10:00 am  
By appointment

**Classes:** MWF 8:10 – 9:00 am  
**Room:** Social Science 356  
**Final:** Wednesday, December 20, 8:00 – 10:00 am  
**TA:** TBA  
**Prerequisites:** CS132, or consent of instructor  
**Textbook:** “*Computer Organization and Architecture*”  
– 5<sup>th</sup> edition, by William Stallings  
**Homepage:** <http://www.cs.umt.edu/CS/COURSES/CS231>

**Important Dates:** September 18 - Graduation Applications for Spring 2001  
September 25 - Last day to drop/add by DialBear/CyberBear  
October 16 - Drop/Adds (no \$\$\$ back) – Fall 2000  
October 16 - Last day to change grade option – Fall 2000  
November 6 - Registration for Spring 2001  
November 7 - Election Day (NO CLASS)  
November 22-24 – Thanksgiving Vacation (NO CLASSES)  
December 8 - Last day to withdraw – Fall 2000  
December 15 - Last day to drop with petition – Fall 2000

### Class Objectives

- Learn system functional partition and interfaces
  - Processor, memory, I/O and the software interface
- Understand instruction formats
- Understand digital logic
- Prepare for future software and hardware classes
  - Stimulate your intellectual interest

<b>Grading Policy:</b>	<b>Homework:</b>	<b>50%</b>
	<b>Midterms (2):</b>	<b>10% + 15%</b>
	<b>Final:</b>	<b>25%</b>

### **Grading**

Your grade will be based on how well you do with respect to the best student in class. The graded homeworks will typically be returned with a solution set one week after submission. Your worst homework grade will be dropped from the final accounting. Late homework will be accepted, but it will be marked down 20% for each day it is late. Homework turned in after 5pm is considered to be the same as turning it in prior to 5pm the next day. Any exceptions to the late rule must be made prior to when the homework is due and the excuse needs to be a good one – just too busy won't cut it.

If you can't make the midterm or the final, you must make arrangements with me prior to missing the exam. Make up exams will be written and oral and they tend to be more difficult than the original version. If you miss an exam without prior notification then you will need appropriate documentation (physician, police, ...) to support the absence as valid.

Collaboration on homework with your classmates is encouraged, but unless the homework is specifically set up as a team project then you are responsible for personally writing and understanding the solutions. The idea is to get the background any way you want, but once you have the background you have to provide answers or solutions on your own. Collaboration on exams is not permitted – it is called cheating. The University has strict and severe penalties for such behavior. The point of exam is to see how much you know on your own.

Appealing the grades on exams and homeworks must be done **within two days** of receiving the graded work. Beware – mistakes in grading do happen, and you are encouraged to help us correct any such mistakes, but realize that mistakes sometimes will be in your favor. It may be the case that under an appeal your grade could actually be lowered if the latter type of mistake is discovered. Perpetual whiners have a tendency to find themselves in the latter category. It's simple courtesy. We will treat you as fairly as we know how and expect you to do the same in return.

### **Attendance**

Attendance is NOT mandatory. Lots of you have different backgrounds and some may feel that they already know the material that we will be covering, so it does not bother me if you don't show up for class. You have to make sure that you turn your homework on time and show up for the midterms and the final – if you can do well even without coming to class that's fine with me. However, missing a class is no excuse for turning in your homework late – it is your responsibility to get the questions and find out the due dates. This all said, it is my opinion that the lectures can help you in reducing your study time outside class, especially if you do the reading and you come ready.

## **Course Material**

Most of the course materials will be online. This also includes this syllabus, which will be updated if and when anything changes. All of the lecture slides will be there as well. Feel free to use them to reduce the note-taking burden. I can't guarantee when they will be available since from time to time I get infected with a massive procrastination or massive over-commitment attack, but they will typically be available one day before the class. Copies of other materials will be available in the CS office – so come by to get a copy if somehow you missed it.

## **Book Coverage**

### **Chapter 1**

- History
- Computer Components

### **Chapter 3**

- Interconnections
- System Buses

### **Chapter 4**

- Main Memory
- Cache

### **Chapter 5**

- Disk, RAID
- Optical Memory

### **Chapter 6**

- I/O

### **Chapter 7**

- Introduction to Operating Systems
- Scheduling, Memory Management

### **Appendix A**

- Digital Logic
- Gates and Circuits

### **Chapter 9**

- Instruction Sets
- Assembly Language

### **Chapter 10**

- Instruction Addressing Modes

### **Chapter 11**

- CPU Organization
- Instruction Cycle and Pipelining

### **Chapter 12**

- RISC

### **Chapter 13**

- Superscalars
- Optimization