Essentials: Communication, Content, and Structure

Communications

Class Meetings:	Tuesday, Friday 11:10 - 12:25
Office:	HN1090J
Office Hours:	Tuesday, Friday 13:00 - 14:00.
Email:	stewart.weiss@hunter.cuny.edu
Telephone:	(212) 772-5469

Resources

Textbooks: David A. Patterson and John L. Hennessy. *Computer Organization & Design: The Hardware/Software Interface*. Fourth Edition. Morgan Kaufmann Publishers. 2008. ISBN-13: 978-0-12-374493-7.

Computing Facilities: Although there are no programming assignments, registered students will be given user accounts on the UNIX hosts in the 1000G lab of the Computer Science Department, located on the tenth floor of Hunter North. This lab is open 24 hours a day, 7 days a week and access to it is limited to students enrolled in selected courses. In addition, students will be able to use a secure remote login service such as ssh to access these accounts.

Website: All course materials, including lecture notes, slides, assignments, syllabi, and other resources, including this document, are posted on my website, at`http://www.compsci.hunter.cuny.edu/~sweiss/course_materials/csci360/csci360_spr11.php`

Prerequisites

Enrolled students must have successfully completed MATH 155 and either CSci 260 or CSci 245.

Departmental Learning Goals

Material in this course supports the following departmental learning goals: 1a: (understanding the basic foundations and relevant applications of mathematics and statistics, particularly those branches related to computer science) through performance analysis of various architectural design choices; 1b: (understanding the relationship between computer architecture and software systems) by discussing how hardware supports various software tasks; 3a: (ability to communicate ideas effectively) by requiring homework that is graded in part on clarity and proper use of the English language; 3c: (ability to perform competitively on the Computer Science GRE) by exposing them to some of the material on that exam. This course fulfills GER 3/B requirement.

Course Objectives and Content

Specific learning objectives of the course are that, after completing the course successfully, the student should be able to:

1. Appreciate the use of buffers to control data-flow.
2. Identify the memory technologies found in a computer and be aware of the way in which memory technology is changing.
3. Describe the various ways of organizing cache memory and appreciate the cost-performance trade-offs for each arrangement.
4. Appreciate the need for cache coherency in multiprocessor systems.
5. Understand the various technologies of storage, including disks and flash storage.
6. Understand the methods of interfacing I/O devices to memory and the processor.
7. Discuss the concept of parallel processing and the relationship between parallelism and performance.
8. Understand how performance can be increased by incorporating multiple processors on a single chip.
9. Appreciate the need to express algorithms in a form suitable for execution on parallel processors.
10. Explain what a GPU is and how it can be used for massively parallel computation.
11. Understand how to program GPUs using CUDA.

This course covers chapters 4 (partially), 5, 6, and 7 and Appendix A of the fourth edition of the Patterson-Hennessy book. Specifically the topics are: pipelining in the processor, the memory hierarchy, storage and I/O, multicores and multiprocessors, and GPUs. There are several major changes to the coverage in this version of the course. There is more extensive treatment of multicore processors and multiprocessing, elimination of all coverage of bus technology, and inclusion of major coverage of GPUs and GPU programming, a cutting edge direction in computer science. The material from chapter 4 will be covered between chapters 6 and 7.

Assignments, Exams, and Grading

Your grade will be based on two midterm exams, a final exam, and a single written assignment of at least 500 words. You are responsible for all subject matter covered in class whether it is listed in this syllabus or not, as well as all textbook readings. The exams are 30% each and the assignment is 10%.

Exam Schedule	
Midterm 1	*Tuesday, March 1*
Midterm 2	*Tuesday, April 5*
Final Exam	*Tuesday, May 24, 9:00 - 11:00*

Incomplete Grades

Any assignment must be submitted by its due date. Failure to take an exam counts as a zero grade on that exam, unless you have a legitimate medical or personal emergency that prevents your timely completion of homework or sitting for an exam. I will schedule a make-up exam or allow a homework extension only in that case. I do not give incomplete (IN) grades except for those students who were unable to complete the work because of legitimate, documented medical or personal problems, and this is entirely at my discretion.

Class Calendar

The last day to drop a class without a "W" is February 17. The last day to withdraw is April 10. There are no classes on Friday, February 11, nor during the spring recess from April 17 through April 26. The last day of class is Tuesday, May 17.

Course Materials, the Web, and Blackboard

All lecture notes will be posted on the course's home webpage, which does not require special privileges to access. Grades will be posted in the grade center on Blackboard. For the purpose of discussions and course-related questions, the class has a Google group with the following essentials:

Name:	`hc_csci360`
Home page:	`http://groups.google.com/group/hc_csci360`
Email address:	`hc_csci360@googlegroups.com`

If you do not have a Google email address, you will not be able to post to this group, so I suggest that you obtain one on or before the start of classes. The Google group will be the means by which to ask and answer questions related to the course. I require that you use the following protocol if you have a question:

1. Check whether the question you want to ask has been posted and answered in the Google group.
2. If it has been answered, you are finished. If not, send the question to the Google group.
3. Anyone in the group can answer the question. If no one else answers the question, I will post an answer to it.

I will ignore any non-personal questions sent to my Hunter email address. Personal questions (such as a question about a grade or missing a class) should be sent via private email to my Hunter email address, not to the Google group.

Academic Honesty

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The college is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. In this class, I will enforce the University's Policy on Academic Integrity and bring any violations that I discover to the attention of the Dean of Students Office.