Welcome to the Fall 2013 CSCI320 Computer Architecture website.

Contents

Instructor

Professor Alan Marchiori

- **Office:** Breakiron 268
- **Office Hours:** MWF 3pm - 4:30pm or by appointment
- **Email:** alan.marchiori@bucknell.edu

Official Course Description

Use hardware description language to describe and design digital systems. Processor design, pipelining, cache and storage systems. Instruction and thread level parallelism, speculation, branch prediction.

Course Objectives

By the end of the semester, students are expected to be able to:

- Design, simulate, and describe the complete operation of a computer system (ABET

a, b, c, k).
- Understand and apply computer architecture principles such as Amdahl's law, parallelism and locality to analyze the performance of different computer systems. (ABET a, e).
- Identify and utilize the various forms of parallelism (ILP, DLP, TLP, etc) to increase system performance.

ABET Outcomes

a. an ability to apply knowledge of mathematics, science, and engineering
b. an ability to design and conduct experiments, as well as to analyze and interpret data
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
d. an ability to function on multidisciplinary teams
e. an ability to identify, formulate, and solve engineering problems
f. an understanding of professional and ethical responsibility
g. an ability to communicate effectively
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. a recognition of the need for, and an ability to engage in life-long learning
j. a knowledge of contemporary issues
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Textbook (required)

Hennessy & Patterson's  Computer Architecture: A Quantitative Approach, 5th Edition. This edition has changed significantly. The 4th edition (or older) will not work.

Audience and Prerequisite

This is a *senior-level core* course for Computer Engineering majors. You are required to have taken CSCI206 (Computer Organization) or have special permission from the instructor. It is highly recommended to have also taken ELEC240/245/340 (aka Digital System Design) and CSCI315 (Operating Systems) as this course will **build** on the material from these classes. Students without this background will be offered extra help if needed.

The workload for this course will be around 12 hours per week on average.

- 3 hours lecture
- 2 hours lab
- 7 hours outside the classroom

Logistics

Course Calendar

- Tentative Course Calendar

Exams

- Exam1StudyGuide.pdf

Lecture

Dana 137

- **CSCI 320 01:** MWF 2:00 PM - 2:52 PM

Lab

Breakiron 164

- **CSCI 320L-61:** T 8:00 AM - 9:52 AM
- **CSCI 320L-60:** T 10:00 AM - 11:52 AM
- Link to the labs

Homework

In this class we will have regular graded homework problems. These will be collected via Moodle.

Wiki

In this class we will be developing the Bucknell Computer Architecture Wiki. The goal of this effort is to develop a wiki to help students understand computer architecture. Each student will be assigned a particular section of the book to write for. They may choose the exact topic, as long as no one else has already written an article on it. Be sure to add your name to your article!

In addition to the assigned wiki writing all students must post two additional resources relating to computer architecture. These could be videos, research papers, or websites about computer architecture. See the sample Videos and Papers sections for good examples. These posts are due on the last day of class.

Group Assignments

Group 1: Appendix A and Chapter 6

```
Lucas Bohidar
Jonathan Como
William Evans
Alexander Meijer
Katherine Olsen
```

Group 2: Appendix B and Chapter 4

```
Christopher Cook
Elizabeth Dwornik
Yifan Ge
Daniel Prudente
Matthew Reed
```

Group 3: Writers: Appendix C and Chapter 2

```
Daniel Eshleman
Davis Gallinghouse
Paul Klufas
Lishi Sun
Douglas Mosher
```

Group 4: Writers: Chapter 3

```
Utsav Agarwal
Matthew Argiro
Geoffrey Barnes
Jack Hutton
Bashar Jarrar
```

Group 5: Writers: Chapter 5

```
Thiago Fujisaka Tanaka
Brigitte Hofmeister
Christopher Rung
Anthony Tomashefski
Steven Walker
```

Policies

Attendance and Participation

An important part of the class is your active participation. If people do not show up to class or do other work (or sleep) while in class it degrades the quality of the class for everyone. Therefore, all students are expected to attend and actively participate in all classes and labs.

If you have to miss a class/lab please contact the instructor **at least 24 hours prior** to the start of that class/lab.

Labs missed without permission will result in a zero for that lab.

Grading

Your final course grade will be determined by the weights below. The quizzes, exams, and final are cumulative.

Wiki	10%
Homework	15%
Exams & Quizzes	20%
Final	20%
Labs	35%

Letter grades will then be assigned using the typical scale:

>93	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
60-69	D
<60	F

Late Work

Late work will not be accepted unless you have a good reason and receive permission from the instructor **>24 hours before** it is due.

Group Work and Academic Integrity

Group work is encouraged in this course and academic integrity is mandatory. Unless specifically noted, you can work with up to 2 other students on any assignment (3 people

total per assignment). However, if you work with another student you **must cite everyone on each submission and how you worked together**. Groups can submit once as a group or individually. If you submit as a group, everyone gets the same grade (unless you request otherwise). If you submit individually, each assignment is graded individually.

Some examples might be:

Citation	Submission	Grade
Alan and Doug worked together	group	both the same
Alan and Doug worked together, but Doug did 90% of the work	group	Doug would get a higher grade
Alan and Doug did problems 1-5 then each finished on their own	individual	individual

Under no circumstances should you give your work to another student. Working together requires everyone to actually work together at the same time on the same problem.

Bucknell University Honor Code

As a student and citizen of the Bucknell University community:

1. I will not lie, cheat, or steal in my academic endeavors.
2. I will forthrightly oppose each and every instance of academic dishonesty.
3. I will let my conscience guide my decision to communicate directly with any person or persons I believe to have been dishonest in academic work.
4. I will let my conscience guide my decision on reporting breaches of academic integrity to the appropriate faculty or deans.