CSE 341 Computer Organization

Summer 2017

Course Description

Basic hardware and software issues of computer organization. Topics include computer abstractions and technology, performance evaluation, instruction set architecture, arithmetic logic unit design, advanced computer arithmetic, datapath and control unit design, pipelining, memory hierarchy, input-output.

Learning Outcomes

The objectives of this course are to give students an in-depth understanding of how a computer is organized & designed and familiarize students with tradeoffs at the hardware/software interface. At the end of this course, each student should be able to:

- understand how a computer is organized and designed.
- analyze a computer system (or subsystem) and compare them based on cost and performance.
- effectively program in assembly language using the MIPS instruction set architecture.
- design a memory subsystem for a computer understand the differences between pipelined and non-piplelined processors
- describe a circuit and simulate it using a hardware description language
- Incorporate all the above into designing a system

Course Prerequisites

CSE 241 (Digital Systems) or or EE 378 CS 241, EE 378, or equivalent

Textbook

David A. Patterson and John L. Hennessy, Computer Organization and Design: The Hardware/Software Interface, 5th edition, Elsevier, 2014

Attendance

Lectures:
While attendance is not required, in class activities and quizzes may not be announced ahead of time.

Recitations/Labs:
Recitations are times where you are meant to be working on your projects and have access to assistance. It is at your discretion if you choose not to use this time. If the time is decided to be used for a quiz a minimum 24 hours notice will be given.

Instructor Contact Information

Dr. Jennifer Winikus
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Website: www.cse.buffalo.edu/~jwinikus
Office Phone: 716-645-4757
Office: Davis 351

Office Hours

TBD

Academic Content

This is a tentative list of topics (in no particular order):

- MIPS assembly language
- Pipelinning
- Computer Instruction Processes
- Computer Performance
- Numeric Representations and arithmetic
- Caches
- Memory Hierarchy

Grading Policies

Your grade will be comprised of:
15 % Exam 1
15 % Exam 2
20 % Final Exam
20 % Homework, Quizzes and other assignments
30 % Projects
2% extra credit will be available by completing one the extra credit options provided.

Your final score for the course will be converted into a letter grade as follows:

- A: 100–94
- A-: 93–90
- B+: 89–87
- B: 86–84
- B-: 83–80
- C+: 79–77
- C: 76–74
- C-: 73–70
- D: 69–60
- F: 59–0

The instructor reserves the right to curve grades if appropriate and as they choose.

Incompletes (I/IU): The course follows the university undergraduate incomplete policy.
A grade of incomplete ("I") indicates that additional course work is required to fulfill the requirements of a given course. Students may only be given an "I" grade if they have a passing average in coursework that has been completed and have well-defined parameters to complete the course requirements that could result in a grade better than the default grade. An "I" grade may not be assigned to a student who did not attend the course.

Prior to the end of the semester, students must initiate the request for an "I" grade and receive the instructor's approval. Assignment of an "I" grade is at the discretion of the instructor.

The instructor must specify a default letter grade at the time the "I" grade is submitted. A default grade is the letter grade the student will receive if no additional coursework is completed and/or a grade change form is not filed by the instructor. "I" grades must be completed within 12 months – see the Incomplete Grade Policy for the schedule. Individual instructors may set shorter time limits for removing an incomplete than the 12-month time limit. Upon assigning an "I" grade, the instructor shall provide the student specification, in writing or by electronic mail,

of the requirements to be fulfilled, and shall file a copy with the appropriate departmental office. Students must not re-register for courses for which they have received an “I” grade

Collaboration Policies

Unless explicitly told, all work is to be done independently with only the assistance of TAs and the instructor. You may discuss the general concepts of assignments and what the question asks for with other students but you must not discuss answers.

Unauthorized collaboration will result in an “F” in the course as a violation of academic integrity.

Exam Policy

There will be 3 exams. Two exams will be in class, the final exam is the last day of class and will take up the class and into the recitation. You must have a valid ID with you at the time of the exam (UB Card will suffice) and your own writing tools. You can not borrow pens or pencils during the exam. During the exam there is to be no talking or looking at your phone, doing so may result in an automatic “F” on the exam based on the incident.

Any accommodations must be made in advanced barring extraordinary circumstances.

Due Dates

All submissions will be made on UBLearns.

Late work:
No work will be accepted after midnight on Friday of the last week of classes barring extraordinary circumstances. This includes regrade requests.

All assignments have a time and a day due date. You may submit up to 24 hours late at no penalty. After that, no late work will be accepted, barring extraordinary circumstances and that no solutions have been released. In that case a late penalty may be applied. If a regrade is desired, you have 1 week from the time the grade is released to requesting a regrade. Corrections are not allowed on homework and lab assignments.

Email Policy

Students are responsible for email sent to their official University at Buffalo email address. Communication will not be done with non-university email addresses. A level of professionalism is expected with all communications.

Accessibility Resources

If you have any disability which requires reasonable accommodations to enable you to participate in this course, please contact the Office of Accessibility Resources, 60 Capen Hall, 716-645-2608, and also the instructor of this course. The office will provide you with information and review appropriate arrangements for reasonable accommodations.

University Policies

Academic Integrity Policy:
http://undergrad-catalog.buffalo.edu/policies/course/integrity.html

University Policy on Accommodations:
https://policy.business.buffalo.edu/Policy%20Library/Reasonable%20Accommodation.pdf

The Office of Equity, Diversity and Inclusion provides many resources including the following policies to be followed:

Discrimination and Harassment:
http://www.buffalo.edu/administrative-services/policy1/ub-policy-lib/discrimination-harassment.html

Reasonable Accommodation:
http://www.buffalo.edu/administrative-services/policy1/ub-policy-lib/reasonable-accommodation.html

Religious Accommodation and Expression:
http://www.buffalo.edu/administrative-services/policy1/ub-policy-lib/religious-accommodation-expression.html

Departmental Academic Integrity Policy
http://www.cse.buffalo.edu/undergrad/policy_academic.php

Departmental Statement on Academic Integrity in Coding Assignments and Projects

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All academic work must be your own. Plagiarism, defined as copying or receiving materials from a source or sources and submitting this material as one's own without acknowledging the particular debts to the source (quotations, paraphrases, basic ideas), or otherwise representing the work of another as one's own, is never allowed. Collaboration, usually evidenced by unjustifiable similarity, is never permitted in individual assignments. Any submitted academic work may be subject to screening by software programs designed to detect evidence of plagiarism or collaboration.

It is your responsibility to maintain the security of your computer accounts and your written work. Do not share passwords with anyone, nor write your password down where it may be seen by others. Do not change permissions to allow others to read your course directories and files. Do not walk away from a workstation without logging out. These are your responsibilities. In groups that collaborate inappropriately, it may be impossible to determine who has offered work to others in the group, who has received work, and who may have inadvertently made their work available to the others by failure to maintain adequate personal security. In such cases, all will be held equally liable.

Departmental Policy on Violations of Academic Integrity

The CSE Department has a zero-tolerance policy for AI violation.
All AI violation cases will be reported to the department, school and university, and recorded.
Even the 1st offense will receive "F" for the course, unless the instructor deems it appropriate to reduce the penalty.
Subsequent violation of AI in any form and in any other course will automatically result in a "F" grade, with no exception.

Final exam is scheduled- August 16- in Lecture and Recitation
Important Dates

First Day of Classes: May 29, 2017
Last Day to Drop/Add: June 5, 2017
Last Day to Resign: July 25, 2017
Last Day of Classes: August 18, 2017
Last Day of Final Exams: TBD