

CSE321 COMPUTER ARCHITECTURE I

Fall, 2001

Class: 356 Fitzpatrick Hall
Mon. Wed. Fri. 1:55pm - 2:45pm

Lab: 177 Fitzpatrick Hall
- Wed. 4:15pm-5:45pm
- Thu. 2:45pm-4:15pm
- Thu. 4:15pm-5:45pm
- First meeting: the week of 9/3

Instructor: Dr. X. Sharon Hu
326D Cushing Hall, 631-6015, hu@cse.nd.edu
Office Hours: Wed. 12:50pm - 1:50pm
Fri. 3:00pm-4:00pm

TA: Stephanie Liu
325 Cushing Hall, hliu@nd.edu
Office Hours: Thur. 12:00pm - 2:00pm

Thomas Slabach
355 Cushing Hall, 631-3906, tslabach@cse.nd.edu
Office Hours: Wed. 3:15pm - 4:15pm
Thurs. 1:45pm - 2:45pm

Nadir Kiyanclar
The Lab
Office Hours: Tues. & Thurs. 11:00am -12:00pm

Randy Rausch
The Lab
Office Hours: Tues. 12:15pm - 2:15pm

Required Texts:

1. D.A. Patterson and J.L. Hennessy, *Computer Organization & Design*, Morgan Kaufmann, 1998.
2. S. Yalamanchili, *VHDL Starter's Guide*, Prentice-Hall, 1998.
3. Course Handouts on the web.

Recommended Reference Texts:

1. M.M. Mano and C.R. Kime, *Logic and Computer Design Fundamentals*, 2nd edition, Prentice-Hall, 1993.

Course Objectives

At the conclusion of this course, you should be able to

- Describe the organizations of a modern computer, the functionality of its key components, the basic instruction execution process, and the different views of a computer system.
- Describe the major factors that effect the performance of a computer system and evaluate the performance under different scenarios. Identify major sources of potential discrepancies between reported performance and actual performance.
- Apply the top-down design methodology to design and implement simple computer systems including datapath and control units.
- Describe the functionalities of a given VHDL program, write simple VHDL code, and use the VHDL tools provided in Mentor Graphics.
- Write, in the assembly languages learned, small programs containing all basic programming structures, debug and execute the code in the simulator environments.
- Analyze and compare different instruction-set features including register usage, addressing modes and support of procedure calls.

More detailed objectives will be given at the beginning of each new topic.

Course Policies and Procedures:

1. Lecture related:

- Due to a physical constraint of the instructor, the lectures will mainly be presented on transparencies. This can be a little dull at times. Your understanding is appreciated!
- The transparencies will contain major points to be discussed in a lecture and will be made available before the intended lecture. However, there will be intentional gaps or missing answers on the transparencies. Such gaps will be used to stimulate speculation and deliberation during or after lectures.
- To make the lectures more active, each lecture will contain a few exercises to be worked out individually or in groups. You will not be penalized for given incorrect or incomplete answers, but your participation is highly encouraged.

2. Tests and exam related:

- Quizzes will be given on a regular basis at the beginning of some lectures. The main purpose is to make sure that you have fully understand the homework and lab problems assigned (as both will be worked out in a team environment to be described later).
- There will be two tests and one final exam. These will be closed-book tests, but you are allowed to bring two crib sheets (plus the ones you created for the previous test of the course) for each test.
- The test dates are temporarily set to October 5 and November 7. The exact times and places will be announced when they become available. Each test will be 50 minute long. The final exam will be 120 minute long, and the date will be announced later as it becomes available.
- Only under unusual circumstances (medical excuse or prior instructor approval) may make-up tests be considered. Otherwise, a zero point will be counted towards your grade.

3. Homework related:

- Unless otherwise instructed, you must work in groups of three or four on the homework, handing in one solution per assignment. Try to stay in the same group throughout the semester.
- On each homework assignment, each group should designate a **coordinator** to make sure everyone understands who is supposed to be doing what¹, a **recorder** to prepare the final solution set, and a **checker** to check the final solution for correctness. Groups of four should also have a **team process monitor**, who records and turns in with the assignment a statement of what the group did well and what (if anything) needs improvement. *These roles should rotate on every assignment.* On each assignment, put the names and roles of the *participating* group members and the assignment number on a cover sheet.

If a student's name appears on a solution set, it certifies that he/she has participated in solving the problems. Students whose names do not appear on a solution will receive zero point.

- Homework should be turned in prior to the start of the class on the due date. Homework will be accepted up to five days after the due date. Late homework will receive a deduction of 20% of the maximum grade for each additional day. However, if a group abuses this privilege by routinely handing in homework late, the privilege will be withdrawn. **Homework solutions will not be posted.** The burden is on you to make sure you find out how to solve the problems before or after they are due.
- For each homework assignment, complete an "Individual Effort Rating for Team Members". (The form is available on the web.) Note that the ratings should reflect each individual's level of participation and effort and sense of responsibility, not his or her academic ability. These results may be used to adjust homework grade for individual effort.
- Teams having problems working together should make every effort to resolve them by themselves. If that doesn't work, see the course instructor for help. Students who consistently fail to pull their weight can as a last resort be fired by unanimous decision of the rest of their team, and the students repeated carrying the load for their teammates can as a last resort quit. **Students who either are fired or quit must find another group willing to take them on – no individual homework will be accepted.**

4. Lab related:

- Lab assignments are to be performed in groups of 2-3 students unless otherwise instructed. The instructor will assign groups. For the guidelines of group participation, see the above on **Homework Related**.
- Lab attendance is required. You should attend your designated session unless previous permission is given by the TA in charge. Preparation for lab assignments is strongly encouraged as the TA will only have a limited amount of time to work with each group during an assignment period.

¹Suggestion: Have each team member set up each problem individually, then get together to work on the details.

- Lab evaluation consists of preparation, demonstration and report. Lab assignments may have different points depending on the contents and lengths of the assignments. Demonstrations should be given at the time designated by the TA. Late demos are generally not accepted unless with prior approval by the TA, in which case, a deduction may be applicable.
- Written documents should follow the guidelines of the homework policy. In particular, on a separate page of each report, include a statement of who is responsible for which part of the project and any specific problems encountered. Again, each student should complete an "Individual Effort Rating for Team Members" and submit it with the report.

5. Grading Guidelines:

- Inquiries about graded homework, lab reports, quizzes and tests will be accepted only if made **within one week** after they are handed back. Such inquiries should be made in writing, which clearly explains the complaints. Only after reviewing the written complaints, can the instructor make any grade adjustments.
- Grade components:

Homework	10%
Laboratory	25%
Test	30%
Quizzes	10%
Final	25%

- The assignment of letter grades will use the following scale: A: ≥ 90 , A-: ≥ 85 , B+: ≥ 80 , B: ≥ 75 , B-: ≥ 70 , C+: ≥ 65 , C: ≥ 60 , C-: ≥ 55 , D: ≥ 45 and F: < 45 . Minor adjustments to the above scale might be made if deemed necessary by the instructor after considering some unforeseen circumstances. However, any deviation from the scale will only improve the letter grades.
- There will be a "gray area" between each two letter grades in the final distribution, so that two people getting the same weighted average grade could get different letter grades. If you are in one of these gray areas, whether you get the higher or a lower grade depends on (i) your participation in the class and lab activities and (ii) whether your test performance has been improving or declining.