CS 331 Lecture 1: Introduction

- Announcements
  - There are no labs this week. They will start next week.
  - If you are not registered for CS 331 in UI Direct, please talk to me after the lecture.
- Overview of the course
- A review of learning skills that will help you get ahead and prepare for the exams

Course Information

- Professor Lui Sha <lrs@cs.uiuc.edu>
- TA: Tim Eriksson <eriksson@uiuc.edu>
- TA: Xiaolei Li <xli10@uiuc.edu>
- Office hours to be announced
- Web site: http://blackboard.cet.uiuc.edu/
- Newsgroup: uiuc.class.cs331
- There are no textbooks for the course. Lecture notes (slides) will be incrementally posted on the course web page.

Blackboard http://blackboard.cet.uiuc.edu

- Login with your NetID and Blackboard password. If you have not used Blackboard before, then your Blackboard password should be the same as your NetID.
- Click on "CS 331 SP03" under My Courses.
- If you have problems, email Tim <eriksson@uiuc.edu>.
- Please read the class announcement, which gives you information on the class schedule, grading procedures, etc.
- If you are auditing the class, you can view class material with
  - Name: cs331
  - Password: guest

CS 331: The Big Picture - 1

- Embedded real time computing systems enable us to:
  - manage the vast power generation and distribution networks.
  - control industrial processes for chemicals, fuel, medicine, and manufactured products.
  - control automobiles, ships, trains and airplanes.
  - conduct video conferencing over the Internet and interactive electronic commerce.
  - send vehicles high into space and deep into the sea to seek new knowledge.
- It is a challenging and exciting area in either the design of embedded hardware or the software systems. For R&D opportunities, see http://www.nap.edu/html/embedded_everywhere/
- CS331 will focus on the software engineering aspect.

CS 331: The Big Picture - 2

- CS 331 is designed to help you master the software engineering aspect of embedded software systems.
  - The basics of micro-computer and how it is interface with external worlds
    - how to program A/D and D/A cards
    - interrupts, serial communications etc
  - Tools of the trade
    - RTOS, timers and periodic tasks
    - programming with threads and processes
  - Theory of the trade: How to analyze and design concurrent real time tasks
    - periodic tasks, aperiodic tasks, synchronization etc.
- CS 331 also teaches the key concepts of the common application domains
    - signal processing
    - feedback control
  - so that you can work with communication and control engineers effectively.

The Most Important Skill

CS 331 is an important course. However, learning how to learn effectively is the most important skills that you can acquire during college years:

- In engineering, new technologies and new knowledge are generated rapidly. Every 3-5 years, we need to significantly revise our course material to reflect the changes.
- You must become an effective and efficient learner to get ahead.

Cone of Learning (Edgar Dale)

After 2 weeks, we tend to remember:

Passive learning

- 10% of what we read
- 20% of what we hear
- 30% of what we see (pictures)
- 50% of what we hear and see

Active learning

- 70% of what we say
- 90% of what we say and do

The more energy that I put into a subject, the more I can remember.
- L. Sha.

Levels of Educational Objectives (B. S. Bloom)

- Level 6: **Evaluation**: Judge, select, decide, critique, verify, debate, assess
- Level 5: **Synthesis**: Create, predict, construct, design, imagine, improve, produce and propose
- Level 4: **Analysis**: Classify, categorize, derive, model
- Level 3: **Application**: Calculate, solve, determine, apply
- Level 2: **Comprehension**: Explain, paraphrase
- Level 1: **Knowledge**: List, recite

Ways to Become an Active Learner

- recall prior material
- answer a question
- guess the solution first (even guessing wrong will help you to remember the right approach)
- work out the next step before you have to read on
- think of an application
- imagine that you were the professor and think about how you would give a test on the subject material so that key concepts and results will be checked.
- summarize a lecture, a set of homework, or a lab concisely in your own words.

Making Yourself an Active Learner in CS331

- CS 331 emphasizes team work in lab exercises. Many great things have been said about team works. And team work is to be encouraged.
- However, everything has its dis-advantages. Sometimes, you can become passive in a group setting and watching how others do, instead of actively participate in the work.
- Make sure that you are not only doing your part in the lab, but also understand the other parts that you partners do.

Preparations for Tests and Exams

- Not all materials are equally important. Educators try to make sure that
  - Key concepts, results and techniques constitute the major part of the tests or exams
  - A reasonable distribution across the subject areas.

- How do I know what are the key concepts, results and techniques?
  - Educators will try their best to tell you that “this is really fundamental/important/ critical during the lectures”
  - They will try to make you spend more time in your homework on important subject matters.
  - They will try to make you work on them in the lab.
  - They will repeat them and review them to make sure that you hear them more than once.
  - They will test you if you have master them.

Web Site that Will Help You to Learn

- What do Smart Students know? “smartness”, for the most part, is effective learning skills that everyone can master.

  There is a link to better education gives a wealth of learning tips from effective notes taking to test anxiety.

  http://www.utexas.edu/student/utlc/handouts/stutips.html

- If you find some better websites, please email to us.