Computer Science 213

Introduction to Computer Systems

Instructor

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What is Computer Science 213?

- The course is an intro to Computer Systems
- Computer System consists of:
  - Hardware
  - Software
    - Operating System
    - Libraries
    - Compilers
    - Application Programs

CPSC 213 from 10,000 Meters

This is a course about
- The relationship between
  - Application software
  - System’s software and
  - Hardware
- How a program is executed by a machine
- How the system components interact to influence the performance of a program
- The limits that the hardware and system software place on your programs
Why is this important?

- It will help you understand
  - how the machine executes a program written in a high level language like Java and C
  - why systems behave the way they do
- It will help you write better, faster and more reliable code
- It will prepare you for study in other areas of computer science

Some Examples You Know

Integers aren’t integers.

Example:
- Is $x^2 \geq 0$?
  - $4000^2 \rightarrow 1600000000$
  - $5000^2 \rightarrow ??$
examples cont’d…

Floats aren’t reals

Example:
- Is \( (x + y) + z = x + (y + z) \)?
  - \( (10^{20} + -10^{20}) + 3.14 \rightarrow 3.14 \)
  - \( 10^{20} + (-10^{20} + 3.14) \rightarrow ?? \)

Outline

Part I : Basic Hardware and Basic Programs
- Basic Hardware Structure
  - A simple computer architecture
    - Simple CPU
    - Memory
  - Instruction Set Architectures
  - A Simple machine simulator
- Execution of a computer program
  - Simulation of basic Java and C statement by our simple machine
  - Java vs C programming
Outline (cont’d)

Part II: Basic Operating System Concepts
- The role of the OS
- Processes
- Threads
- Process scheduling

Outline (cont’d)

Part III: IO Devices
- Disks
  - Hardware view of a disk
  - OS support for disks
    - File systems
    - System calls
    - Performance issues
- Networking
  - Networking API
  - Protocols, protocol stacks
  - Networking hardware
  - Design models
Course Prerequisites

- CPSC 121 and 210 (or 211) or
- CPSC 260, EECE 256 and CPSC 210 (may be taken concurrently)

Course Workload

- Assignments
  - 5-6 programming assignments
- Readings
- Examinations
  - Midterm: **Wednesday July 13th 12:00-1:00pm**
  - Final Exam: **Saturday July 30th 12:00-2:30pm**
Purpose of Assignments

- Help in learning the course concepts
- Develop skills in:
  - Problem solving
  - Programming
  - Debugging
  - Communication

Assignments (aka labs)

- All assignments of this course are lab assignments, i.e. are started in a lab section and handed in later
- Lab assignments may vary in length from half to 1 week
- Lab assignments will be done in groups of two
- Assignments will be posted on the course website and will be handed in electronically using handin
- Late assignments are not accepted
Lab Sessions

- 3 sessions per week of 2 hours each session
- Each assignment may span over 2-3 lab sessions
  - 1st session – TAs will provide guidance to help start the lab
  - next one or two sessions will usually be devoted to getting help to finish the assignment
- Lab/assignment descriptions will be given out prior to labs
- You must read the lab and think about a solution before you attend the first lab for it
- Labs are the best places to get help
  - Labs will have both a tutorial and “please help” component

LAB Schedule for this term

- **L1A:**
  Mon Wed Fri 10:00 12:00 in ICCS X350

- **L1B:**
  Mon Wed Fri 15:00 17:00 in ICCS X350

- **L1C:**
  Mon Wed Fri 17:00 19:00 in ICCS X350
Before the next lab:

- Make sure your account is active and that you can get logged in
- For every lab make sure you have read the lab and know what you are supposed to do before you go to the lab
- NO LABS TODAY
- WEDNESDAY: A short lab to
  - check your account and make sure that you can run the simulator
  - find a partner for the lab assignments
- REGULAR LABS START ON FRIDAY, JUNE 24

Grading

- In Class Exercises 5%
- Labs/Assignments 25%
- Midterm 20%
- Final Exam 50%
- To pass the course you must
  - pass the final
  - pass the assignments (get at least 50% average on them)
  - get at least a 50% average overall
- The lower of the computed grade or 45% will be assigned if above conditions are not met
Resources

- Course web page
  - [http://www.ugrad.cs.ubc.ca/~cs213](http://www.ugrad.cs.ubc.ca/~cs213)

- Bulletin Board
  - Vista BB for the course:
    - [http://www.vista.ubc.ca](http://www.vista.ubc.ca)

- Text book
  - *Computer Systems A Programmer’s Perspective (1st or 2nd Edition)*
    - Authors: Bryant & O’Hallaron

- Recommended: A C reference manual
  - *The C Programming Language (2nd Edition)*
    - Authors Brian Kernighan, and Dennis Ritchie

Where to ask for help

- Vista – bulletin board
- TAs
  - During labs
  - Via the bulletin board
  - We’ll try to have TA’s in Learning Center
- Instructor
  - After lectures
  - Office hours
  - Email if something is urgent
Welcome to Computer Science 213

Work Hard and Enjoy