

# CS/ENGRD 2110 SPRING 2013

Lecture 1: Overview  
<http://courses.cs.cornell.edu/cs2110>

## Welcome to CS2110!

- We'll be learning about...
  - OO, abstract data types, generics, queries on Java collections, other cool Java features
  - Reasoning about complex problems, analysis of the algorithms we create to solve them, and implementing those tricky algorithms with elegant, easy to understand, correct code
  - Recursion on graphs and other linked structures
  - Algorithmic complexity
  - (+ lectures on cloud computing & quantum computing)

## Is CS2110 right for you?

- **Knowledge of Java not required**
  - About 40% of students know Java
  - Others know Matlab, Python, ...
  - Requirement: comfort with some programming language. Prior knowledge of OO and "strong typing" not required.
- Don't take cs1110 just because you are worried that your high school programming experience won't do
- *We recommend against skipping directly to cs3110. cs3110 requires permission from both Prof Birman and Prof Joachims!*

## Lectures

- TR 10:10-11am, Statler auditorium
  - Attendance is mandatory
  - Old videonotes from 2010 are available but the course has evolved since then ...
- ENGRD 2110 or CS 2110?
  - **Same course!** We call it CS 2110 in online materials
  - Non-engineers sign up for CS 2110
  - Engineers sign up for ENGRD 2110

## Sections

- Like lecture, attendance is mandatory
- Usually review, help on homework
- Sometimes new material
- Section numbers are different for CS and ENGRD
- Each section led by member of the teaching staff
- No permission needed to switch sections, but do register for whichever one you attend

## CS2111

- **New!**
  - An "enrichment" course
  - Aimed at students who want slightly more help understanding core ideas behind Java, objects, and programming
  - Taught by Professor Gries, 1 credit S/U, only for students who also take CS2110.
- We hope to help students who might otherwise feel overwhelmed by CS2110

## Academic Excellence Workshops

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- Two-hour labs: students work together in cooperative setting
- One credit S/U course based on attendance
- Time and location TBA
- See website for more info:

[www.engineering.cornell.edu/student-services/learning/academic-excellence-workshops/](http://www.engineering.cornell.edu/student-services/learning/academic-excellence-workshops/)

## Resources

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- Book: Frank M. Carrano, *Data Structures and Abstractions with Java, 3<sup>rd</sup> ed.*, Prentice Hall
  - Note: 2<sup>nd</sup> edition is okay
  - Sharing textbook: fantastic idea. You don't need a personal copy. You do need access to it from time to time
  - Copies on reserve in Engr Library
- Additional material on Prentice Hall website
  - "e-Book" not required
- Great Java resource: online materials at Oracle JDK web site. Google has it indexed.

## Obtaining Java

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- Follow instructions on our « resources » web page
  - Make sure you have Java JDK 1.6 or 1.7, if not download and install. We explain how on the page.
  - Then download and install the Eclipse Juno « IDE » for Java developers from Eclipse IDE for Java Developers
- Test it out: launch Eclipse and click "new>Java Project"
  - This is one of a few ways Java can be used
  - When program runs, output will be visible in a little console window

## Eclipse IDE

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- IDE: Integrated Development Environment
  - Helps you write your code
  - Protects against many common mistakes
  - At runtime, helps with debugging
- Follow "Resources" link to download



"In my country of Kazakhstan everyone is use Eclipse and Java!  
Java 1.7 is best for hack American web site and steal credit card."

## Learning Java

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- CS 2110 assumes that students are totally new to Java —we'll teach you the language
- We assume you are comfortable programming in some other language, so we'll teach Java at a pretty fast pace
- By end of course, you'll have seen some "extreme Java" capabilities...



## Coursework

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- 5 assignments involving both programming and written answers (45%)
- Two prelims (15% each)
- Final exam (20%)
- Course evaluation (1%)
- Possible surprise in-class quizzes (4%)

## Assignments

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- A1 and A5: do by yourself
- A2-A4: teams of one or two (not more than two)
  - ▣ A1 will be posted soon on CMS
  - ▣ We encourage you to do them by yourself and have considered making this the rule
  - ▣ Finding a partner: choose your own or contact your TA. Piazza is incredibly helpful.

## Piazza

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- Click link on our web page to register
- Incredible resource for 24x7 help with anything
- We keep an eye on it, but people help each other out too.



## Academic Integrity... Trust but verify!

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- We use artificial intelligence tools to check each homework assignment
  - ▣ The software is very accurate!
  - ▣ It tests your code and also notices similarities between code written by different people
- Sure, you can fool this software
  - ▣ ... but it's easier to just do the assignments
  - ▣ ... and if you try to fool it and screw up, you might fail the assignment or even the whole course.



## What's CS 2110 about?


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- Computational tools are "universal" but the key is to master computational thinking.
  - ▣ Looking at problems in ways that lead naturally to highly effective, correct, computational solutions
  - ▣ There are many ways to do anything, but some are way better than others
- Mastery of computational thinking will help you become a master of the universe!
- Also: Great job prospects with high salaries...



## Example (we'll see it again in April...)

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- Suppose you wanted to build a massive database of pictures of people and stuff about them
- ... then create smart eyeglasses
  - ▣ 
- In the past a concept like this was crazy...
  - ▣ Today, it can be solved with "cloud computing" + Java programs to search huge image databases fast...
  - ▣ ... With CS2110 you'll be about 1/3 of the way there
    - Also: Snavely's vision course + Ken's cloud computing course

## A class declaration defines

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- Format/content of **objects**, which can contain variables and functions/procedures
- Variables and functions/procedures for which only ONE copy exists

```
Circle@75ab39f2
radius 10.2
setRadius(double)
diameter()

Circle@75ab302b
radius 3.4
setRadius(double)
diameter()

PI 3.1459          area(Circle)
```

A class defines the form and behavior of some type of objects.  
But your program needs to explicitly create them.

## World's simplest Java program

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- Writing "Hello world" in Java using Eclipse
- Running it
- Understanding line by line exactly what it says

*Let's launch Eclipse and see these steps in action*

## Next steps?

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- Attend a recitation section this week
- Repeat what we just did but do it yourself
  - ▣ Try making mistakes and see what Eclipse "says"
  - ▣ Try making it a little fancier
- Drop in to see what CS2111 is about this afternoon (two times, on Tuesday)