1 Course Announcement

Emphasizes object-oriented design and programming in Java, an effective modern technique for producing modular, reusable, internet-aware programs. Also introduces interactive computer graphics, user interface design and some fundamental data structures and algorithms. A sequence of successively more complex graphics programs, including Tetris, and culminating in a significant final project, helps provide a serious introduction to the field intended for both potential concentrators and those who may take only a single course. No prerequisites and no prior knowledge of programming required.

2 Course Description

CS15 is a standalone course which introduces computers, systematic analysis of problems, and object-oriented design and programming techniques. The course may be taken by anyone, with or without previous computing experience. No math background beyond basic algebra is required. CS15 will teach you object-oriented design and programming in Java and the use of graphical user interfaces. It will also introduce you to some of the important concepts in computer science, such as data structures and computational efficiency. In doing so, the course takes an interactive, graphical approach to programming assignments and an equally interactive approach to lectures. Andy’s lectures are supplemented with skits performed by the UTAs (Undergraduate Teaching Assistants) to teach course concepts and to make the class fun and enjoyable!

3 Course Format

CS15 lectures are during K hour (Tuesday and Thursday, 2:30pm - 3:50pm). You are expected to attend all class hours. You are responsible for everything said in class. Andy’s notes and audio annotated Powerpoint slides for every lecture can be found on the CS15 webpage.

There will be no tests, quizzes, papers, or final examinations in CS15. Instead, you will be assessed primarily based on your implementation of 7 programming projects. In addition, there will be several written assignments as well as written design questions pairs with the later programming assignments. CS15 also includes mandatory weekly 90 minute labs.
CS15 requires that you start working consistently from the time an assignment is handed out. Procrastination followed by cramming will result in great pain and anguish. This is not a threat but a survival tip. Assignments are closely spaced and each assignment uses concepts from previous work. This makes it very difficult to fall behind on one assignment and still complete the next one. Starting early is the key to successful programming in CS15.

Typically, students find that CS15 requires about 15 hours of coursework a week.

4 Collaboration Policy and Grading

CS15 has a Collaboration Policy that provides specific guidelines for what you can and cannot do in regard to working with other students. This policy is based on Brown’s Academic Code of Conduct, but it is specific to CS15. A copy of this policy is available on the course website. Overall, while students may discuss concepts in the context of the lecture material, any collaboration on any stage of a project or assignment (e.g. designing, debugging, or programming) is a violation of our policy.

The course staff takes violations of the collaboration policy very seriously and will prosecute them with the standing committee on the academic code as necessary.

Like many courses in the Computer Science department, CS15 relies heavily on the role of its Undergraduate Teaching Assistants. In addition to holding over 150 hours of TA office hours and facilitating programming labs, the CS15 Undergraduate TAs also grade all student work (with supervision from the Head TAs and Andy).

5 Lecture Topics

Throughout the semester, CS15 will cover Object-Oriented Programming Fundamentals, Arithmetic and Flow of Control, Data Structures and Algorithms, and other advanced topics. Below are the specific topics for each lecture.

1. 9/10/15: A Gateway to Computer Science - Welcome to CS15
2. 9/15/15: Calling and Defining Methods in Java
3. 9/17/15: Introduction to Parameters and Math
4. 9/22/15: Parameters and Making Objects
5. 9/24/15: Inheritance
6. 9/29/15: Interfaces
7. 10/01/15: Polymorphism
8. 10/06/15: Static Methods, Constants, and Making Decisions
9. 10/08/15: Introduction to 2D Graphics in JavaFX

10. 10/13/15: Building Your Own Custom Graphics

11. 10/15/15: Loops

12. 10/20/15: Arrays

13. 10/22/15: Design Patterns

14. 10/27/15: Recursion

15. 10/29/15: Big-O and Sorting

16. 11/03/15: Linked Lists

17. 11/05/15: Stacks and Queues

18. 11/10/15: Trees

19. 11/12/15: Hash Tables

20. 11/17/15: Final Project Overview

21. 11/19/15: Final Project Help Sessions

22. 11/24/15: Computer History, Programming Languages, and Computer Architecture

23. 12/01/15: Computer Graphics

24. 12/03/15: (Head TA Lectures) Model-View-Controller and Concurrency

25. 12/08/15: (Head TA Lectures) Research and Industry Experience

6 Required Reading

If you decide to take CS15 (and we hope you do!), you will also be held responsible for all of the information in the detailed course missive, the collaboration policy, and any class announcements in lecture or via email.