From Electrons to Facebook - **A Whirlwind Introduction to CS**

Student Taught Class Fall 2015

Course Description

Literally starting from electrons, this course will teach students without a computing background exactly how the machines we surround ourselves with every day actually work from the bottom up. Because of this broad spread of information, we will be touching on every part of the CS curriculum (except programming). Therefore, it can be a good way to gauge if the full curriculum is right for you. The course will also attempt to touch on the history of computer science.

This course is a single credit seminar. Therefore, it is intended to be a fun exploration without being a burden on your schedule.

The list of topics is tentatively: transistors, digital logic, processors, programming, operating systems, networking, web browsers, and a bonus topic to be chosen by students.

Prerequisites

The course is structured for students who are not currently enrolled in Computing Majors (CS, EE, or CpE). Therefore, the course targets students in other engineering majors who are interested in learning more about computers as well as students who are unsure if a Computing Major is right for them. **There will be no programming in this course.** Therefore, prior experience with programming is neither required or helpful for this course.

Optimally, this course would be for motivated students who are interested in computers but have never had a chance to fully explore them.

Course Instructor

Hunter Leath - 4th Year Computer Science and Economics major. Currently researching the dynamics of a secure, decentralized social network.
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Professor of Contact

David Evans - Professor of Computer Science who heads the Security Group
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Textbooks

There is no textbook. There will be online readings for becoming acquainted with background material and for more information that can be covered in the course.

Grading Policy

60 points - Attendance: 5 points for each class attended (up to 40 points max)
40 points - Final Project or Paper: Student choice between a paper that explores a specific topic in more detail than the class or a hands-on project for more motivated students.

Weekly Schedule

The following is a tentative weekly schedule of what would be covered by this course. Each week will focus on a specific area of Computer Science and be tied to a course actually taught in the CS department.

Additionally, each lecture will feature a short segment at the end that relates the day's topics to real world experience using computers.

Week 1 - CS 3102

- What is Computer Science?
- What is Computation?
- Electrons, Electricity, and Transistors

Week 2 - CS 2330

- Introduction to Binary
- Introduction to Digital Logic
- Building gates using Transistors

Week 3 - CS 2330

- Introduction to "State", clocks
- Registers
- Building a "processor"

Week 4 - CS 3330

- Memory
- Generalizing our Processor
- Code versus Data

Week 5 - CS 2150 / 4610

- What is programming?
- How does a programming language work?

Week 6 - CS 4414

- What is a program?
- How do we run multiple programs?

Week 7

- Peripherals (graphics, sound, and USB, oh my!)

Week 8 - CS 4457
- What is the internet?
- TCP/IP
- Routing

Week 9 - CS 4720
- HTTP and the World Wide Web

Week 10 - CS 4102
- How does a computer scientist think?
- Algorithms

Week 10 - Computers Everywhere
- Putting it all together: visualizing the complex computer systems that we interact with everyday

Week 11 - Projects / Bonus
Final project presentations by motivated students, or bonus lecture given student preferences.

Week 12 - Bonus
This lecture is saved as a bonus to cover a topic of the student's choice. It could be a more in depth explanation of a topic already covered, or something totally crazy (Bitcoin, Security, etc.)