Intro to CS Syllabus

Fall 2017

Instructor Information

Instructor	Email	Office Location & Hours
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General Information

Description

This course serves as an introduction to computer science. Many topics will be taught in this class, including basic mathematics, the fundamentals of programming (relying heavily on the C++ computer language with either the clang++ or the gcc compiler), statements and loops, computer architecture, parameter passing, software development, computer security, and algorithms.

Expectations and Goals

All students will be expected to follow the University of Virginia's Honor Code at all times. Collaboration with other students is prohibited on homework assignments and in-class quizzes. Using notes is prohibited on in-class quizzes. Reviewing notes is strongly encouraged on homework assignments. If a student is having difficulty, they will be expected to contact the instructor. The Honor Code will be enforced on every assignment. If a student violates the Honor Code, they will be dismissed from the course with a grade of "F."

Grading Scale

97.0%	A+	93.0%	A	90.0%	A-
87.0%	B+	83.0%	B	80.0%	B-
77.0%	C+	73.0%	C	70.0%	C-
67.0%	D+	63.0%	D	60.0%	D-
		0.0%	F		

A grade greater than or equal to 60.0% is considered passing. A grade less than 60.0% is considered failing.

Grade Weights

Attendance	10%
Homework	50%
Quiz	10%
Final Exam	30%

Course Materials

Required Materials

The only materials that this class requires is a laptop with Internet access. The website Code Chef (https://www.codechef.com/ide) will be used frequently for coding assignments, and students will be expected to create an account before the second class meeting.

Required Text

No textbook is required for this course.

Course Schedule

Chapter 1: Introduction to Programming

- Lesson 1: Computer Science
- Lesson 2: Computer Programming
- Lesson 3: Programming Languages
- Lesson 4: Introduction to C++
- Lesson 5: Reserved Words
- Lesson 6: Return Types
- Lesson 7: Hello, World! Program

Chapter 2: Mathematics and Programming

- Lesson 1: Functions
- Lesson 2: Input and Output
- Lesson 3: Parameters
- Lesson 4: Function Calling

Chapter 3: Statements and Loops

- Lesson 1: if Statements
- Lesson 2: if / elif / else
- Lesson 3: Iteration
- Lesson 4: Arrays and Vectors
- Lesson 5: Elements and Indexing
- Lesson 6: for Loops
- Lesson 7: while Loops

Chapter 4: Computer Architecture

- Lesson 1: Compiling
- Lesson 2: Linking
- Lesson 3: Assembly
- Lesson 4: Machine Code
- Lesson 5: Memory Layout
- Lesson 6: The Heap
- Lesson 7: The Stack
- Lesson 8: Cache

Chapter 5: Parameter Passing

- Lesson 1: Passing by Value
- Lesson 2: Passing by Reference
- Lesson 3: Pointers
- Lesson 4: Null Pointers
- Lesson 5: Dereferencing a Pointer
- Lesson 6: Dangling Pointers
- Lesson 7: Segmentation Faults

Chapter 6: Software Development

- Lesson 1: Requirements
- Lesson 2: Design
- Lesson 3: Coding/Implementation
- Lesson 4: Integration
- Lesson 5: Release
- Lesson 6: Maintenance

Chapter 7: Computer Security

- Lesson 1: Vulnerabilities
- Lesson 2: (Stack) Buffer Overflow Attacks
- Lesson 3: Address Space Layout Randomization
- Lesson 4: Stack Canaries
- Lesson 5: Pointers
- Lesson 6: Viruses
- Lesson 7: Sandboxing with VirtualBox
- Lesson 8: Vector [index] vs. .at(index)

Chapter 8: Algorithms

- Lesson 1: Properties of an Algorithms
- Lesson 2: Examples of Algorithms
- Lesson 3: Adding Array Elements
- Lesson 4: Sorting
- Lesson 5: Searching