University of Alabama
CS 104: Computer Science Principles
Fall 2011

Tentative Course Schedule

Resources:

B2B: Abelson, H., Ledeen, K., and Lewis, H. *Blown to Bits: Your Life, Liberty, and Happiness After the Digital Explosion*. 2008.

AI: Wolber, D., Abelson, H., Spertus, E., and Looney, L. *App Inventor: Create Your Own Android Apps*. 2011.

BYOB: Berkeley's adaptation of Scratch – Build Your Own Blocks

Date	Subject, Topics, and Big Idea[Learning Objective(s)]	Resources, Assessments
8/24/11	**Subject:** Intro to Course **Topics:** • Review Syllabus • Presentation – Why Study CS? **Objectives:** 2[5a], 8[28]	**Resources:** **Assessments:** • Student Information Sheet
8/29/11	**Subject:** CS Unplugged and Tidbits **Topics:** • Intro to bits • Claude Shannon • Moore's Law • Principles of bits • Positives/Negatives of technology • Parity bits/Error correction • Binary numbers • Sorting/Searching **Objectives:** 2[5b, 6], 8[28, 29, 30, 31]	**Resources:** B2B Ch. 1 Notes Posted Online **Assessments:** • Explanation of Assignment #1
8/31/11	**Subject:** Basic Terminology, Programming Process **Topics:** • Basic Terminology (HW, SW, programming languages, syntax, storage, variables) • Programming Process (5 steps)	**Resources:** Notes posted online **Assessments:** • Quiz: 8/24 and 8/29 material

	• How to plan (flowchart/pseudocode) **Objectives:** 2[5c], 4[15]	
9/5/11	*No Class – Labor Day*	
9/7/11	**Subject:** Intro to Logic **Topics:** • Spaghetti Code • Structure (Sequence, Decision, Iteration) • Examples in BYOB **Objectives:** 1[1, 4], 4[15, 16], 5[19]	**Resources:** Notes posted online **Assessments:** • Assignment #1 Due: CS Essay • Class exercise in BYOB
9/12/11	**Subject:** Algorithms **Topics:** • Relational/Logical operators • Operator precedence • Boolean operators • Truth tables • Loops **Objectives:** 1[1, 2, 4], 2[6], 4[15, 16, 17]	**Resources:** Jeannette Wing, "Computational Thinking" Notes Posted Online **Assessments:** • Looping BYOB class exercise
9/14/11	**Subject:** Algorithms and BYOB **Topics:** • BYOB Examples: - Loop equivalence examples - Maze example - Cursor control - Broadcast (hinting at abstraction) - Multiple backgrounds • Explain Team project #1 **Objectives:** 1[1 – 5], 4[15 – 18], 5[19, 21, 22]	**Resources:** Notes posted online **Assessments:** • Quiz: Relational/Logical operators • BYOB Loop examples • BYOB Maze example
9/19/11	**Subject:** Building Custom Blocks **Topics:** • Types of custom blocks (Command, Reporter, Predicate) • Procedural abstraction • Parameters and validation of parameters • Recursion	**Resources:** http://byob.berkeley.edu/: Tutorial #1 Notes posted online **Assessments:** • BYOB square example using abstraction • BYOB recursion example

	Objectives: 1[1 – 5],2[7, 8], 4[15 – 17], 5[19 – 23]	
9/21/11	**Subject:** Lists **Topics:** • Data structures • How to create a list in BYOB along with list functions • Sorting and searching lists **Objectives:** 1[1 – 5], 4[15 – 17], 5[19 – 23]	**Resources:** http://byob.berkeley.edu/: Tutorial #1 Notes posted online **Assessments:** • Assignment #2 Due: Logic/BYOB • Quiz: Parameters, recursion, swapping variables, procedural abstraction • BYOB sum, arcade, and music examples
9/26/11	**Subject:** More on Lists **Topics:** • Linear search (arcade game) • Sorting (selection sort) • Binary search **Objectives:** 1[1 – 5], 2[7], 4[15 – 18], 5[19 – 23]	**Resources:** Notes posted online **Assessments:** • BYOB arcade example
9/28/11	**Subject:** Recursion **Topics:** • BYOB examples: - Song - Fibonacci number calculator • Sorting and Searching • Student project idea presentations **Objectives:** 1[1 – 5], 4[15 – 18], 5[19 – 23]	**Resources:** Notes posted online **Assessments:** • BYOB song and Fibonacci calculator examples • Worksheet: Sorting and Searching • Student presentations
10/3/11	**Subject:** Image Representation/Cryptography **Topics:** • Privacy and Information Security • History of Cryptography • Terminology • Secret writing (steganography, watermarks, Caesar Cipher, ROT13) • Public Key Cryptography • Digital certificates/signatures **Objectives:** 2[5 – 8], 7[27]	**Resources:** Notes posted online **Assessments:** • Worksheet: Image representation using binary numbers
10/5/11	**Subject:** Abstraction and the Internet	**Resources:**

	Topics: • Kramer's Paper • Abstraction in Art, Life, BYOB, and CS • Abstraction in the Internet - IP addresses/DNS server - Packets - Protocols • Privacy: hidden bits **Objectives:** 2[5 – 8], 6[24 – 26],	Jeff Kramer, "Is Abstraction the Key to Computing?" B2B Ch. 2 and 3 Notes posted online **Assessments:** Quiz: Lists, Sorting, and Searching
10/10/11	**Subject:** BYOB Project Presentations **Topics:** • BYOB Team Presentations **Objectives:** 1[1 – 5]	**Resources:** **Assessments:** • BYOB Team Project Presentations
10/12/11	**Subject:** Intro to App Inventor **Topics:** • Description • Examples • Background information • Installation instructions **Objectives:** 1[1 – 5]	**Resources:** AI Ch. 1 Notes posted online **Assessments:** • Assignment #3 due: BYOB program
10/17/11	*Exam #1*	
10/19/11	**Subject:** Intro to App Inventor **Topics:** • Interface - Components - Layout • Paint Pot program (AI Ch. 2) **Objectives:** 1[1 – 5]	**Resources:** David Wolber, "App Inventor and Real-World Motivation" AI Ch. 2 Notes posted online **Assessments:** • AI Paint Pot program
10/24/11	**Subject:** Models **Topics:** • Introduction to types of models • Two guest speakers from BBVA Compass Bank (model developers from Risk Management)	**Resources:** Notes/Videos posted online **Assessments:** • Assignment #4 discussed: Essay on models

	• Big Data **Objectives:** 2[9], 3[11, 14]	
10/26/11	**Subject:** App Inventor Continued **Topics:** • Discussion of concepts and terminology from text • Mole Mash game • Discuss Team Assignment #2 **Objectives:** 1[1 – 5]	**Resources:** AI Ch. 3 and 4 Notes posted online **Assessments:** • Quiz: HelloPurr (Take home quiz) • AI Mole Mash example
10/31/11	**Subject:** Conditionals and Loops in App Inventor **Topics:** • Conditionals – Relate to BYOB • Loops – Relate to BYOB • Explain that while the syntax (blocks) is different, the functionality is the same **Objectives:** 1[1 – 5], 4[15 – 18], 5[19 – 23]	**Resources:** AI Ch. 18, 19, and 20 Notes posted online **Assessments:** • Assignment #4 due: Essay of the evaluation of a computer model • In-class examples in App Inventor
11/2/11	**Subject:** Procedures and Lists **Topics:** • Review procedural abstraction • How to create custom procedures within App Inventor • Relate to BYOB • Illustrate lists and associated functions in App Inventor **Objectives:** 1[1 – 5], 2[7, 8], 4[15 – 18], 5[20, 22]	**Resources:** Notes posted online **Assessments:** • In-class examples in App Inventor
11/7/11	**Subject:** Big Data **Topics:** • Example of Big Data (CAPS data) • Exercises using Big Data • Why is this skill important? **Objectives:** 1[1 – 5], 3[10 – 14], 4[16 – 18], 5[19 – 23]	**Resources:** Notes posted online **Assessments:** • In-class App Inventor examples
11/9/11	**Subject:** More Big Data Examples	**Resources:** Notes posted online

	Topics: • Continue App Inventor example from previous class **Objectives:** 1[1 – 5], 3[10 – 14], 4[15 – 18], 5[19 – 23]	**Assessments:** • In-class App Inventor examples
11/14/11	**Subject:** Hangman **Topics:** • Discuss Assignment #5: Hangman • Give requirements and hints in class • Catch-up on other material **Objectives:** 1[1 – 5], 2[7, 8], 4[15 – 18], 5[20, 22]	**Resources:** Notes posted online **Assessments:** • Quiz: Abstraction and recursion • Discuss Team Project #2
11/16/11	**Subject:** Information Security **Topics:** • Lack of privacy online • Internet "fingerprint" • Examples of hacks in the news • Ethics • Review for Exam **Objectives:** 7[27]	**Resources:** B2B Ch. 5 and 6 Notes posted online **Assessments:** • Class discussion
11/21/11	*Exam #2*	
11/23/11	*No Class – Thanksgiving Break*	
11/28/11	**Subject:** Cutting Edge Technology **Topics:** • Impact of technology on society • How research stimulates growth **Objectives:** 7[28 – 31]	**Resources:** Notes and videos posted online **Assessments:** • Assignment #5 due: App Inventor Program (Hangman)
11/30/11	**Subject:** App Inventor Project Presentations **Topics:** • App Inventor Team Presentations **Objectives:** 1[1 – 5]	**Resources:** **Assessments:** • App Inventor Team Project Presentations
12/5/11	**Subject:** Final Exam Review **Topics:** • Cumulative Exam Review	**Resources:** Notes posted online **Assessments:**

	• Catch-up day **Objectives:**	
12/7/11	*College Board Exam*	