

**CSIS-110**

**Introduction to Computer Science**

**Spring 2018**

**Study Tips for Exam 1**

The exam will be held on Wednesday, February 28, from 7:00 pm – 9:00 pm in RB 202 (the large lecture hall off the Roger Bacon lobby). You may bring one 8 ½- by 11-inch sheet of paper to the exam with anything you want **hand written** on both sides (No tape/staple/paper clip/etc. extensions allowed; no post-it notes either!). If your study sheet does not meet the requirements, you will not be allowed to use it. **Calculators are not allowed on the exam. All cell phones must be turned off. There will be a clock in the room, so you shouldn’t need your cell phone for anything.**

The readings for the exam are:

* Chapters 1-4 in the Dale/Lewis (CSI) text;
* Chapters 1-6 in the Guzdial/Ericson (Python) text.
* Also review your class notes, homework problems, and labs 1-4.

Note that anything covered in class, lab, homework, or either textbook’s assigned readings is fair game for the exam, but here are some Potential Exam Topics:

**Data Representation**

* Binary numbers and the types of data they represent
* Sign magnitude representation. **If the value is in sign magnitude representation, we will note that.**
* Converting from base 2 (binary), base 8 (octal) and base 16 (hexadecimal) to base 10 (decimal) and back
* Number of things that can be represented with *b* bits, both signed and unsigned
* Largest value that can be represented with *b* bits, both signed and unsigned
* Representing text (ASCII code, Unicode)
* Representing color (blue, green, red components) in decimal or hex
* Representing images (digitization of images, pixels)
* Text compression (run-length encoding, Huffman codes)

**Boolean Expressions, Gates, Circuits**

* Boolean expressions (AND, OR, NOT operations)
* AND notation (a • b, ab, a AND b all represent the same thing)
* OR notation (a + b, a OR b both represent the same thing)
* NOT notation (NOT a, ā, a' all represent the same thing)
* Truth tables
* Gates (AND, OR, NOT)
* Circuits
* Sums of products circuit construction algorithm
* Boolean expression evaluation, given T/F values for inputs

**Python Multimedia**

* The JES Python environment (command area vs. program area, etc.)
* Naming things (variable assignment)
* Basic data manipulation (print, input, arithmetic, …)
* Types of values (integer, string, real number, picture, etc.)
* Names, values, and function results are interchangeable
* Defining a function
* Inputs (parameters) to a function
* Calling (using) a function
* “for” loop to modify all pixels in a picture
* Accessing individual pixels
* Changing pixel colors (negating, increasing red, grayscale, etc.)
  + getRed, getBlue, getGreen
  + setRed, setBlue, setGreen
  + makeColor, getColor, setColor
* Mirroring algorithms
* Copying a range of pixels (or whole picture) into another picture
* Color distance
* Tracing “if” statements

There might be some short-answer questions on Python. There will definitely be Python questions in which we give you some code and ask you what it does. There will also be Python questions where we ask you to write code to solve a particular problem. A great way to master the Python material is to (a) type in and try out each of the sample programs in Chapters 1-6 of the Python text; and (b) pick out and attempt to solve several (5-10) problems at the end of each chapter.