

# ***CS 200 Fall 2014***

## ***Final Preparation Guide***

Exam Date: **December 15, 2014**

Location & Time: **In-class, 11:50 - 1:50 PM (and in lab during last week of classes)**

In this exam, you will have a mix of multiple-choice questions and some short answer questions. To study, you should attempt the examples and exercises at the end of indicated textbook sections/ chapters. Also review the written assignments and quizzes.

### **Programming Questions**

The lab section during the last week of classes will be the programming portion of the exam. Note: the question could require you to write code, read code and/or debug code. As before, the programming portion will constitute 20% of the exam. However, it will be designed to require no more time than the programming portions of the midterms.

The programming topic is graphics. The coding will be based on the Graph class from Prichard, which was used during the last official lab session. You will need to know basic graph concepts and terminology from Rosen. You will also need to be very familiar with two important graph algorithms: Dijkstra's shortest path and Prim's minimum spanning tree. The best source for these algorithms is the Walls and Mirrors (Prichard) text, section 14.4.

### **Key concepts**

The problems in this exam will be about the concepts covered in the lectures over the course of the entire semester. Please review your lecture and lab/recitation notes ([https://www.cs.colostate.edu/~cs200/Fall14/home\\_progress.php](https://www.cs.colostate.edu/~cs200/Fall14/home_progress.php)) as well as the required readings in the two textbooks.

The distribution of points will reflect the amount of time spent on the topic either in lecture, in the readings, in the labs or in the assignments. The material since Midterm 2 (graphs) will be weighted roughly twice as much as the material in Midterms 1 and 2. Because the final exam is double the weight of the midterms, the total points for the final will be 200.

Review the midterm study guides for the list of topics from that material. Working out the problems from the recitations prior to those exams would help refresh your memory of that material.

The topics from the course after Midterm 2 are:

**Graphs**

Lecture Notes: Graphs Part 1 and Part 2

Text: Chapter 14(Prichard), Section 10-1 ~ 10-6 (Rosen)

1. Know the terminologies of a graph such as parts/properties of a graph (e.g., vertex, degree, etc.), types (e.g., directed graph, pseudograph, etc.), special graphs (e.g., complete, cycle, etc.) and derived constructs (e.g., path, connected component, etc.)
2. Relationship of graphs and trees
3. The handshaking theorem
4. Graph representations and implementations: adjacency matrix and adjacency list
5. Graph traversal algorithms. Know both DFS and BFS algorithms.
6. Connectedness of graphs for both directed and undirected
7. Important algorithms: how they work, what application they solve, what their pseudocode is.
  - a. Topological sorting algorithms
  - b. Minimum spanning tree algorithm
  - c. Dijkstra's Shortest path algorithm
8. What is an Euler path, and circuits? Know how to find them.
9. What is a Hamiltonian circuit? Know how to find them.
10. Know the Graph Coloring and TSP problems.

Time permitting, additional tree data structures may be covered. This will be updated if that happens.