# CPSC 131 Final Exam Study Guide

# Fall 2018

You can find the date and time of the final exam in our Titanium post. These are the same times as those listed in the [official final exam schedule](http://admissions.fullerton.edu/CurrentStudent/FinalExaminations.php).

The final exam is not cumulative, though it may make passing reference to material that was covered earlier, such as the concept of recursion or the terminology of “lists” and “nodes.”

You can expect the format of the exam to resemble that of our homeworks. Expect questions involving short answer, sketching data structures, stating big-O efficiency classes, and writing short C++ functions. The exam will be short enough that a prepared student should not feel any time pressure. The exam is **closed book, closed notes**.

The following material is fair game:

1. Binary search trees
   1. Binary trees (unordered)
   2. Binary tree traversal: in-order
   3. Binary search trees (without rebalancing)
   4. Best-case and worst-case binary search trees (Visually, Big-O)
   5. Search, insertion, and removal in binary search trees
2. AVL trees
   1. AVL tree height invariant
   2. AVL trees always have height
   3. Search, insertion, and removal in AVL trees (with the aid of the AVL Tree Trinode Restructuring Handout)
   4. Maps: Concept of keys, values, and key-value associations
   5. When to use maps
3. Hash tables
   1. Concept of hash tables and hash functions
   2. Hash function
      1. Mod operation
   3. Hash codes
      1. Converting to an integer
   4. Polynomial accumulation
   5. Collision-handling
      1. Chaining
      2. Linear probing
      3. Quadratic probing
      4. No collisions - Direct hashing
4. Graph ADT
   1. Terminology: graph, vertex, edge,, adjacent, path, path length, distance.
   2. When to use
   3. Adjacency list
   4. Adjacency matrix
   5. Efficiency tradeoffs between the two implementations
5. Graph traversals
   1. Depth first search (DFS)
   2. Breadth first search (BFS)