Math 112 **Study Guide for the Midterm**

The midterm is open-book and open-notes. These are the things you should know:

- Know how to determine if a circuit is an Euler circuit and how to Eulerize it if it is not.
- Know how to use the sorted edges and nearest neighbor algorithms to find a Hamiltonian circuit.
- Know how to use Kruskal's algorithm to find a spanning tree.
- Know how to determine the critical path and the length of the critical path in a digraph. Know how to determine which times to shorten to make the critical path shorter.
- Be able to use the first fit, next fit, and worst fit algorithms to solve bin packing problems.
- Be able to schedule independent processes on 2 or more machines using the decreasing time list algorithm.
- Be able to determine the winner of an election using plurality, Borda count, the Hare system, and sequential pairwise voting.
- Be able to determine the winner(s) of an election using approval voting.
- Be able to determine the Banzhaf power index of the individuals in a weighted voting system. Be able to recognize dummy voters (those with no power) and dictators (those with all the power).