

**Spring 2024 COP 3502H Sec 201 Exam #2 Review**  
**Test Date/Time: March 26 (R) 9:00-10:15 am ENG1-427**

**I. Recursion – Brute Force Only**

- a. Permutation
- b. Combination
- c. Derangements
- d. Backtracking – Eight Queens
- e. Min-Max Trees (not tested)

**II. Recurrence Relations**

- a. Iteration Technique
- b. Master Formula

**III. Linked Lists**

- a. iterating through an existing list
- b. inserting (front, in order, back)
- c. deletion
- d. use of recursion
- e. various structural changes

**IV. Stacks and Queues**

- a. Stacks - Array Implementation, Run Times
- b. Stacks - Linked List Implementation, Run Times
- c. Queues - Array Implementation, Run Times
- d. Queues - Linked List Implementation, Run Times
- e. Evaluating Postfix Expressions with an operand stack
- f. Converting Infix Expressions to Postfix with an operator stack
- g. Use of a Queue in a Breadth First Search

## **V. Binary Search Trees**

- a. Traversals**
- b. Use of Recursion**
- c. Searching for an item**
- d. Insertion**
- e. Deletion**
- f. Finding the height of a node**
- g. Finding the number of items in a binary tree**
- h. Finding the sum of items in a binary tree**
- i. Other functions - counting leaf nodes, etc.**

## **VI. Sorting**

- a. Bubble Sort**
- b. Insertion Sort**
- c. Selection Sort**
- d. Merge Sort**
- e. Quick Sort**

**Format: Mostly coding, some tracing, no multiple choice or T/F.**

## **How to Study:**

- 1) Look over the notes.**
- 2) Look over example code.**
- 3) Look over your code.**
- 4) Look for general patterns.**

**Don't try to just memorize each algorithm, though you should remember the steps in each algorithm. Instead, try to understand the underlying reason the algorithm works so that you can apply those ideas to problems that may call for slightly different algorithms.**

## **Types of Questions:**

**Short Answer: Write a single line of code to complete some task.**

**Function Tracing: Give the output of some program or segment of code.**

**Code Writing: Write a function or complete a segment of code to solve some problem.**

**Exam Aids: NO EXAM AIDS**