CSCE 121(505-508) **Exam 3 Review**

- Exam 3 will be comprehensive. About 2/3 of the questions, however, will focus on material from chapters 17 and following.
- For the material from earlier chapters, it is probably most useful to review the earlier exams and make sure you understand key concepts that were included in those questions. The idea is to make sure you remember the concepts that each question deals with – i.e. make sure you could answer similar but different questions.
- I expect a total of 90 questions. The exam will last 2 hours. It will again be multiple choice, so bring a scantron form.
- I will still have questions where you need to choose the BEST answer, so please be sure to read all answers and choose the one that is most correct.
- The questions will be designed mainly to test concepts. I will not try to put in obscure syntax questions or things that could easily be mistaken for a typo. If you see those cases, please check with me during the exam. For instance, on the last exam, I accidently capitalized "if" to "If" – that was just a typo error, not an intentional mistake. I might accidentally leave off a semicolon or something. If you are wondering whether a problem is intentional or not, just ask.
- The test is not meant to cover C++ Syntax, but you will need to know syntax to answer questions. You should not need to focus on things that are library specific
- It is always a good idea to review:
    - The terms at the end of the chapters
    - The review questions at the end of the chapters
    - The slides (some questions may be from the book and only lightly covered by slides, and some slides may not be used at all, but for the most part the key information will be on slides).

- From the earlier tests, some of the key ideas you should be familiar with include:
    - Compilation of headers/libraries/etc.
    - Functions
    - Passing by value and by reference
    - Scope of variables
    - Exceptions
    - Grammar
    - Recursion
    - User-defined types, including enum, structs, classes
    - Defining classes:
        - Constructors
        - Member functions
        - public/private/protected
    - General I/O concepts
    - Key Object-Oriented design principles (and how these are seen in C++)
        - Encapsulation
        - Inheritance
        - Polymorphism
    - GUIs and event-driven programming
- From the later chapters, you will probably need to know the following:
    - Chapter 17
        - The free store (aka heap) and how is it different from the stack
            - Be able to say when something is on the heap vs. on the stack
        - Pointers
            - What are they
            - How are they declared
            - How are they dereferenced
        - Allocating memory
        - Destructors

        - References
    - Chapter 18
        - Copying data
            - Copy constructors
            - Assignment (=) operators
            - Shallow vs. deep copies
        - Arrays
            - Allocating arrays
            - Indexing into arrays
            - Pointers and arrays
    - Chapter 19
        - Generic programming
        - Templates
            - When to use a template
            - Restrictions on template parameters
        - Resource management
            - Allocating and deallocating memory
    - Chapter 20
        - Containers as a generic way of storing
            - Other containers besides vector: list,
        - Iterators as a way of sequentially visiting elements in a container
            - Basic iterator operations: ==, !=, *, ++
            - Use of iterators with containers
    - Chapter 21
        - Algorithms
            - Generic structure of algorithms
            - Defining function objects to help make algorithms more generic
            - Sort, Accumulate, and inner product as example algorithms
        - Maps
            - Associative containers
            - Assumptions of a map implementation.
    - Chapters 22-27
        - You are NOT responsible for all the material in these chapters
        - Review the slides put together for class
        - The slides list the key sections from each chapter
        - You should be sure you are familiar with those sections and the material on the slides themselves
        - You do not need to learn the additional material from those sections.