CSCI 135 – Fundamentals of Computer Science I
Exam II Study Outline

I. Software Development Life Cycle
    A. Understand the Problem – Specification
    B. Work out the Logic – Design
    C. Convert it to Code – Programming
    D. Test / Debug
    E. Maintenance
II. Functions
    A. Library Functions
    B. User Defined Functions
        1. Parameters
        2. Return Values
    C. Flow of Control
    D. Calling a Method
III. Object Oriented Programming
    A. Classes
        1. Classes vs Objects
        2. Constructors
        3. Attributes (state)
        4. 4. Methods (behavior)
            a. Important Methods to consider
                1. Constructors
                2. Getters and Setters (Accessors and Mutators)
                3. Equality Checking: equals()
                4. Printable Representation: toString()
                5. All other behaviors
        5. Lists of objects
        6. self
    B. Inheritance
        1. Advantages
        2. Subclasses and Superclasses
            a. super() keyword
            b. self keyword
            c. Method Overriding
            d. Which method executes?
    C. Client Programs
IV. Object Oriented Design
    A. Data Encapsulation Model
        1. Classes

2. Client(s)

B. Data Encapsulation
    1. Getters (Accessors)
    2. Setters (Mutators)

C. Immutability

D. Object Oriented Analysis
    1. Find the nouns
    2. Determine attributes
    3. Determine methods (verbs + CRUD)
    4. UML Diagrams

IV. Exceptions
    A. Defending against bad input
    B. Handling unexpected events

V. Testing and Debugging
    A. Preventing Bugs
        1. Write pseudocode (English-like) first
        2. Comment the tricky parts
        3. Good coding style
            a. Variable names
            b. Break into manageable steps
            c. Indentation
            d. Watch loop bounds
            e. Listen to Idle/compiler feedback
        4. Incremental development
    B. Finding Bugs
        1. Add debug print statements
        2. Talk through the logic
    C. Testing

1. **Know these definitions**
2. **Unit testing** is testing some program unit in isolation from the rest of the system
3. **Black box testing** is a unit testing strategy that is specification based
4. **White box testing** is a unit testing strategy that is program based