CIS1400: Program Logic and Technique
Final Exam Review Topics

Understanding Functions
Definition of a Function (header, body, return)
- Pseudocode Implementation
- Flowchart Implementation

Library Functions
- Random Number Generator
- Mathematical
- Data Type Conversion
- Formatting
- String

Calling a Function
IPO Chart for Documentation
Validation Functions
Defensive Programming

Advanced Data Types
Array Declaration (and Initialization)
Accessing Array Elements
Passing Arrays as an Argument to a Module/Function
Array Processing Using Loops
- Calculating Total/Average
- Finding highest/lowest Values
- Copying

Advanced Array Processing
- Parallel Arrays
- Multi-Dimensional Arrays

Data Files
File Types (binary, text)
File Access (sequential, direct)
Using Files for Input/Output
- Declaration, Open, Read/Write/Append, Close

Delimiters (EOF)
Using Loops to Process Files (Input/Output)
Using Arrays to Process Files (Input/Output)
Processing Record Data in Files
- Adding, Displaying, Searching, Modifying, Deleting

Control Break Logic

Algorithms
Sequential Search
Bubble Sort
Selection Sort
Insertion Sort
Binary Search

Object Oriented Programming

Procedural versus OOP
Classes, Fields, Methods, Objects
Creating a Class Type
- Field Declarations
- Constructor Method (Default)
- Accessor Methods
- Mutator Methods

Access Specifiers (Public, Private)
Creating a Class Variable
Creating an Object and Assigning Address to Class Variable
Unified Modeling Language (UML) Diagram
Steps in OOP Design
- Determine Classes (nouns)
- Determine Class Responsibilities
  - Things class should know (fields)
  - Actions class performs (methods)

OOP Characteristics
- Encapsulation
- Inheritance
- Polymorphism

GUI and Event Driven Programming

User Interfaces
- Command Line
- GUI

User Interface Flow Diagram
GUI Design Guidelines
GUI Components
- Label, Text Box, Check Box, Combo Box, Slider, Buttons, Radio Buttons, List Box

Steps in GUI Development
- Design the Window
- Design the Event Handlers