**CSCI 145 OUTLINE**

JAVA LANGUAGE AND OBJECT ORIENTED DEVELOPMENT

TEXT: Brief Java by Cay Horstmann 9th ed John Wiley 2019

Or Big Java 9-th ed Wiley 2019 (overlap - ch 1-14 only)

C Horstmann, -Core Java - online bonnus : ch 13 Java FX , supplement\*

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| **Topics** | **Sections** | **Time** |
| Computer System: basic computer architecture, software, hardware and networks, history of computing and programming, a first Java program, compilation, types of errors. | 1.1 - 1.8 | 1.75 Hours |
| Using Objects: types, variables, introduction to objects, string literals, defining and testing a class, creating objects, constructors, methods, accessor and mutator, the API documentation, a frame window, graphical shapes, drawing on a component, text, color | 2.1 - 2.13 | 3.25 Hours |
| Implementing classes: instance variable, ecapsulation, the public interface of a class, commenting, providing the class implementation, unit testing | 3.1 - 3.9 | 2.5 Hours |
| Fundamental data types: number types, assignment, arithmetic and mathematical functions, calling static methods, type conversion, strings, reading, input and characters. | 4.1 - 4.6 | 3.5 Hours |
| Decision and Iterations: if statement, comparing values, multiple alternatives, repetition (while, for), nested loops, processing input, random numbers and simulation, code coverage, the debugger | 5.1 - 5.5  6.1 - 6.6 | 3.75 Hours |
| Array Lists and Arrays: storing numbers in array lists, declaring and accessing arrays, copying arrays, two dimensional arrays | 7.1 - 7.8 | 2.5 Hours |
| Designing Classes: cohesion and coupling, immutable classes, side effects, preconditions, postconditions, static variables and methods, scope, packages | 8.1 - 8.10 | 2.75 Hours |
| Inheritance: inheritance hierarchies, inheriting instance fields and methods, overriding methods, subclass construction, converting from subclasses to superclass, polymorphism and inheritance, the top "Object", using inheritance to customize frames | 9.1 - 10.8 | 3.5 Hours |
| Interfaces and Polymorphism: developing reusable software, converting between types, polymorphism, using a strategy interface for improving reusability, inner classes, mock objects. Event Handling: events, event listeners and event sources, applications with buttons, mouse events, timer events | 10.1 - 9.11 | 3.5 Hours |
| Reading/writing text files, throwing exceptions, checked and unchecked exceptions, exception handling: catch and finally. The Exception class hierarchy | 11.1 - 11.8 | 5 Hours |
| Software engineering: software life cycle, discovering classes, relationships between classes, examples | 12.1 - 12.5 | 1.25 Hours |
| Recursion, recursive thinking, recursive helper methods, efficiency of recursion vs. iteration, permutations.  Graphical use interfaces: Swing text areas, processing text input, layout management, GUI design choices, menus, exploring the Swing documentation, Graphics with FX , scene, events, layout (online) | 13.1 - 13.5  20.1 – 20.5  \* Ch13 bonnus to core Java  13.1-13.4 | 3.75 Hours |
| Sorting and searching: selection and merge sort, binary search. Introduction to data structures: ADT, linked lists, stacks, queues. | 14.1 - 14.8  15.1 - 15.4 | 2 Hours |

Submitted by: Pop

Notes:

* 1 hour = 1 hour of face time
* This outline allows for 3 hours of exams.