145 Topical Outline

Java Language and Object Oriented Programming

*Java Software Solutions -- Foundations of Program Design*

by J. Lewis and W. Loftus, 9th Edition, Pearson

Approved: Spring 17 Effective: Fall 2017

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| **Topics** | **Sections** | **Time** |
| Computer Systems: basic computer processing, software, hardware, networks, the Java programming language, program development, object-oriented programming | 1.1 – 1.6 | 2.5 hours |
| Data and Expressions: strings, variables and assignment, primitive data types (int, float, double, char, and boolean), expressions, data conversion, interactive programs | 2.1 – 2.6 | 3 hours |
| Classes and Objects: packages, the Random class, the Math class, formatting output, enumerated types, wrapper classes, anatomy of a class, anatomy of a method, instance data, encapsulation, parameters, constructors, local data and scope, UML, graphics with JavaFX, basic shapes and colors, GUI components | 3.1 – 3.11   4.1 – 4.9 | 7 hours |
| Conditionals and Loops: control flow, selection (if, if/else, and switch), repetition (while, for, do/while), relational operators, logical operators, comparing data, conditional operators, iterators,  reading text files, ArrayList class, event sources | 5.1 – 5.10  6.1 – 6.6 | 5 hours |
| Object-Oriented Design: interfaces, software development activities, software testing, class relationships, GUI design, mouse and key events, event handling | 7.1 – 7.12 | 4 hours |
| Arrays: one-dimensional and multidimensional arrays, arrays of objects, arrays and graphics | 8.1 – 8.9 | 4 hours |
| Inheritance and Polymorphism: base class and derived classes, protected members, the “super” reference, overriding methods, class hierarchies, abstract classes, abstract methods, polymorphism via inheritance and interface, sorting and searching, designing for polymorphism | 9.1 – 9.8  10.1 – 10.9 | 6 hours |
| Exceptions: error-handling techniques, basics of Java exception handling (try, throw, catch, and finally), exception propagation, the Exception class hierarchy, checked and unchecked exceptions, writing text files, threads | 11.1 – 11.9  Supplement for threads | 4 hours |
| Recursion: recursive thinking, recursive methods, recursion vs. iteration, using recursion | 12.1 – 12.5 | 2.5 hours |
| Data Structures: collections, linked lists, stacks, queues, trees, graphs, generics | 13.1 – 13.5 | 2 hours |

Submitted by: Vo   
Notes:

* 1 hour = 1 hour of face time
* 16-week Term: 1 week = 2.8333 hours (face time)
* 6-week Term: 1 week = 7.5 hours + 7.5 hours (face time)
* The above outline allows 3 hours for exams