What to Know for the Comp 1510 Midterm

You are responsible for all of the non JavaFX material in the first five chapters of the text and the notes on debugging and unit test. As preparation for the exam, you should thoroughly read and study this material. Evidence of this would be that you can correctly answer the self-review questions in each chapter and can do the exercises at the end of each chapter.

For each statement, you are expected to know its syntax.

You are expected to know the class methods highlighted in the text figures or used in the examples.

Chapter 1 Computer Systems

1. Introduction to programming
2. Hardware components, the memory model
3. Programming - comments, reserved words, predefined
4. Java program with main method
5. Language levels, compilers, interpreters
6. Error levels, syntax, semantic run-time errors

Chapter 2 Data and Expressions

1. String objects and literals - escape sequences, concatenation, printing with System.out methods
2. Variables and assignment – declaration, compatibility, constants
3. Primitive data types and literals
4. Arithmetic expressions, increment/decrement operators, assignment operators
5. Data conversion – assignment conversion, promotion, casting
6. Creating objects, references, String class
7. Interactive input, Scanner class and methods, simple regular expressions (Fig. 2.7, Appendix I)

Chapter 3 Using Classes and Objects

1. Creating objects, object reference variables, aliases, garbage collection
2. String class and methods (Fig. 3.1), immutable
3. Modular and non-modular projects, module-info.java
4. Packages – class libraries, import
5. Random class (Fig. 3.4)
6. Calling class methods (static) – Math class (Fig. 3.5)
7. Formatting output – NumberFormat (Fig. 3.6), DecimalFormat (Fig. 3.7)
8. Enumerated types
9. Wrapper Classes – which correspond to each primitive type, methods (Fig. 3.9), autoboxing

Chapter 4 Writing Classes

1. Anatomy of a class – class members, instance data, method declarations, instantiation
2. Encapsulation and visibility modifiers, accessors and mutators
3. Anatomy of a method – method declaration, parameters and return type
4. Parameter passing and the local variable storage mechanism
5. Scope of local variables contrasted with instance variables
6. Returning information from methods
7. Tracing flow of control
8. Constructors

Chapter 5 Conditionals and Loops

1. Boolean expressions - relational operators, logical operators
2. if statement, if-else statement
3. Block statements
4. Nested if statements
5. Comparing data – integer types, floats, characters, objects, == vs. equals
6. while statement - types of loops, infinite loops, nested loops, break/continue
7. Iterators - example using Scanner on text files
8. Loop design - loop initialization, zero iterations, sentinel-controlled loops
9. The ArrayList class and methods (Fig. 5.8)

Notes: Debugging and Unit Tests

1. Stack Trace, Breakpoints,
2. Running IDE in debug mode
3. Stepping through code
4. Examining variables, expressions, watchpoints
5. Test Levels
6. Focus of unit tests
7. Junit framework
8. Junit best practices
9. Code coverage

In addition to the theory covered, you should be able to solve problems of different levels of difficulty with the material that has been covered.

Coding questions will indicate whether or not Javadoc is required. If a question does not *say* it requires Javadoc, then Javadoc is *not* required for that question.

Coding questions will also indicate whether or not Checkstyle is required. If a question does not mention Checkstyle, then the answer does not need to conform to Checkstyle. Whether or not Checkstyle is required, good style and clear code is required.

Time can be an issue on exams. Things that you are able to do by memory will gain you time to apply to figuring out how to solve problems.

Remember, you should be able to answer all of the quick-check exercises and review questions at the end of chapters 1-5 of the text. You should be able to explain all the points in the summary of key concepts lists at the end of each chapter.

Remember to bring pencils for the opscan answers. There will be no internet access, nor any electronic devices allowed. Cell phones, if brought, must be powered off.