PROGRAMMING IV JAVA

Course Description:
Students will acquire a better understanding of object-oriented programming by utilizing the Java language. Most businesses use Java or a similar high level language. Students will be using programming to problem solve and complete numerous programs throughout the course. These programs will have great variety ranging from common math problems to real life situations.

Chapter 1: Introduction to Computers and Java

As evidenced based on classroom assessments, the student is able to:

LT1.1	Understand the basics of computer hardware, software, and programming languages, focusing on Java [CS1.a.1.h]
LT1.2	Identify the basic elements of a program and understand Java compilation and execution [CS1.a.2.h]
LT1.3	Outline the programming process and principles of object oriented programming [CS1.a.3.h]

Chapter 2: Java Fundamentals

As evidenced based on classroom assessments, the student is able to:

LT2.1a	Explain the parts of a Java program and basic input/output methods [CS2.a.1.h, CS1.a.2.h]
LT2.1b	Implement input and output methods [CS2.a.1.h, CS1.a.2.h]
LT2.2a	Describe variables, data types, literals, and arithmetic/assignment operations [CS2.a.2.h]
LT2.2b	Use variables, data types, literals, and arithmetic/assignment operations [CS2.a.2.h]
LT2.3a	Explain the use of named constants, variable scope, and string operations [CS2.a.3.h]
LT2.3b	Apply named constants, manipulate strings, and follow scope rules [CS2.a.3.h]
LT2.4a	Recognize proper commenting and Java style conventions [CS2.a.4.h]
LT2.4b	Write well-commented Java programs that follow style conventions [CS2.a.4.h]

Chapter 3: Decision Structures

As evidenced based on classroom assessments, the student is able to:

LT3.1a	Analyze decision-making constructs (if, if-else, etc.) [CS2.a.5.h]
LT3.1b	Use decision-making constructs [CS2.a.5.h]
LT3.2	Implement nested decision structures and manage variable scope [CS2.a.5.h]
LT3.3a	Explain the conditional operator and switch statements [CS2.a.5.h]
LT3.3b	Use the conditional operator and switch statements [CS2.a.5.h]

Chapter 4: Loops and Files

As evidenced based on classroom assessments, the student is able to:

LT4.1a	Explain loops using increment and decrement operators [CS2.a.6.h]
LT4.1b	Implement loops using increment and decrement operators [CS2.a.6.h]
LT4.2a	Describe running totals and sentinel values [CS2.a.6.h]
LT4.2b	Use running totals and sentinel values in programs [CS2.a.6.h]
LT4.3a	Understand when to use 'for,' 'while,' and 'do-while' loop control statements [CS2.a.6.h]
LT4.3b	Use 'for,' 'while,' and 'do-while' loops effectively [CS2.a.6.h]
LT4.4	Use nested loops [CS2.a.6.h]
LT4.5a	Explain file input/output concepts [CS2.a.7.h]
LT4.5b	Read from and write to files [CS2.a.7.h]
LT4.6	Use the Random class to generate random values [CS2.a.8.h]

Chapter 5: Methods

As evidenced based on classroom assessments, the student is able to:

LT5.1a	Explain the use and structure of void and value-returning methods [CS2.a.9.h]
LT5.1b	Define, call, and use both void and value-returning methods [CS2.a.9.h]
LT5.2a	Describe argument passing and data type compatibility [CS2.a.9.h]
LT5.2b	Pass arguments correctly to methods [CS2.a.9.h]
LT5.3a	Explain variable scope and lifetime within methods [CS2.a.9.h]
LT5.3b	Manage local variables and scope appropriately in methods [CS2.a.9.h]
LT5.4a	Explain how and when to return values from methods [CS2.a.9.h]
LT5.4b	Return values correctly using appropriate data types [CS2.a.9.h]
LT5.5	Solve problems using methods, including exception handling [CS2.a.9.h]

Chapter 6: A First Look at Classes

As evidenced based on classroom assessments, the student is able to:

LT6.1a	Describe the relationship between classes and objects [CS2.a.10.h]
LT6.1b	Use classes and objects appropriately in Java programs [CS2.a.10.h]
LT6.2a	Explain the purpose of instance fields, methods, and data hiding [CS2.a.10.h]
LT6.2b	Create classes with fields and methods that demonstrate encapsulation [CS2.a.10.h]
LT6.3a	Describe constructors and their role in object creation [CS2.a.10.h]
LT6.3b	Write and use constructors to initialize objects [CS2.a.10.h]
LT6.4a	Explain method overloading and field shadowing [CS2.a.10.h]
LT6.4b	Implement method overloading and handle shadowed instance fields [CS2.a.10.h]
LT6.5a	Understand packages and import statements [CS2.a.10.h]
LT6.5b	Organize and access classes using packages and import statements [CS2.a.10.h]
LT6.6b	Design Java classes that reflect sound object-oriented design principles [CS2.a.10.h]

Chapter 7: Arrays and the ArrayList Class

As evidenced based on classroom assessments, the student is able to:

LT7.1a	Explain the basics of arrays, including accessing elements and I/O operations [CS2.a.11.h]
LT7.1b	Access and manipulate array elements [CS2.a.11.h]
LT7.2a	Describe techniques to process arrays, such as enhanced for loops and reference reassignment [CS2.a.11.h]
LT7.2b	Use enhanced for loops and reassign array references [CS2.a.11.h]
LT7.3a	Explain how arrays are passed as arguments [CS2.a.11.h]
LT7.3b	Pass arrays as arguments to methods [CS2.a.11.h]
LT7.4a	Describe useful array algorithms such as comparison and summing [CS2.a.11.h]
LT7.4b	Implement array algorithms like sequential search and summing [CS2.a.11.h]
LT7.5a	Explain returning arrays from methods [CS2.a.11.h]
LT7.5b	Return arrays properly from methods [CS2.a.11.h]
LT7.6a	Describe how arrays of Strings are used [CS2.a.11.h]
LT7.6b	Work with arrays of Strings [CS2.a.11.h]
LT7.7a	Explain arrays of objects [CS2.a.11.h]
LT7.7b	Manipulate arrays of objects [CS2.a.11.h]
LT7.8a	Describe sequential search and selection sort algorithms [CS2.a.11.h]
LT7.8b	Implement sequential search and selection sort algorithms [CS2.a.11.h]
LT7.9a	Explain two-dimensional arrays and their operations [CS2.a.11.h]
LT7.9b	Work with two-dimensional arrays [CS2.a.11.h]
LT7.10a	Describe arrays with three or more dimensions [CS2.a.11.h]
LT7.10b	Work with multi-dimensional arrays [CS2.a.11.h]
LT7.11a	Explain command-line arguments, varargs, and the ArrayList class [CS2.a.11.h]
LT7.11b	Use command-line arguments, varargs, and ArrayList effectively [CS2.a.11.h]

Chapter 8: A Second Look at Classes and Objects

As evidenced based on classroom assessments, the student is able to:

LT8.1a	Explain static class members [CS2.a.12.h]
LT8.1b	Use static members properly [CS2.a.12.h]
LT8.2a	Describe passing and returning objects in methods [CS2.a.12.h]
LT8.2b	Pass and return objects correctly [CS2.a.12.h]
LT8.3a	Understand toString, equals, and copy methods [CS2.a.12.h]
LT8.3b	Implement toString, equals, and copy methods [CS2.a.12.h]
LT8.4a	Explain aggregation, the this keyword, and enumerated types [CS2.a.12.h]
LT8.4b	Use aggregation, this, and enums appropriately [CS2.a.12.h]
LT8.5a	Understand garbage collection and class collaboration [CS2.a.12.h]
LT8.5b	Demonstrate class collaboration principles in programs [CS2.a.12.h]

Chapter 9: Text Processing and More about Wrapper Classes

As evidenced based on classroom assessments, the student is able to:

LT9.1a	Understand wrapper classes' purpose and usage [CS2.a.13.h]

LT9.1b	Use wrapper classes appropriately [CS2.a.13.h]
LT9.2a	Explain character testing and conversion concepts [CS2.a.13.h]
LT9.2b	Use Character class methods [CS2.a.13.h]
LT9.3	Use String methods for searching, substring, and modification effectively [CS2.a.13.h]
LT9.4a	Understand the StringBuilder class, constructors, and methods [CS2.a.13.h]
LT9.4b	Use StringBuilder to manipulate strings efficiently [CS2.a.13.h]
LT9.5a	Explain parsing strings with StringTokenizer or split [CS2.a.13.h]
LT9.5b	Parse strings and process tokens [CS2.a.13.h]
LT9.6a	Explain numeric wrapper classes, toString, constants, autoboxing/unboxing [CS2.a.13.h]
LT9.6b	Use numeric wrapper classes and autoboxing/unboxing correctly [CS2.a.13.h]

West Salem High School is a Target-Based Grading and Reporting School. The learning targets above appear in the Skyward gradebook. Teachers provide feedback on each learning target to parents and students via the Skyward gradebook using a score of 3 (Proficient), 2 (Approaching), 1 (Needs Support), or 0 (No Evidence).