Archbishop Spalding High School

Course Syllabus: AP Computer Science - Java
Instructor: Mrs. Brunner

Textbook Information: Java Software Solutions
Author: Lewis, Loftus, & Cocking

FIRST SEMESTER	
Week	**Topics**
1,2,3,4	**Computer Systems** • Describe the relationship between hardware and software • Define various types of software and how they are used • Identify the basic computer hardware and explain what it does • Explain how the hardware components execute programs and manage data • Describe how computers are connected together into networks to share information • Introduce the Java programming language • Describe the steps involved in program compilation and execution • Introduce graphics and their representations
5,6,7,8	**Objects and Primitive Data** • Define the difference between primitive data and objects • Declare and use variables • Perform mathematical computations • Create objects and use them • Create graphical programs that draw shapes
9,10,11,12	**Program Statements** • Discuss basic program development steps • Define the flow of control through a program • Learn to use if statements • Define expressions that let us make complex decisions • Learn to use while and for statements • Use conditionals and loops to draw graphics
13,14,15,16	**Writing Classes** • Define classes that act like blueprints for new objects, make of variables and methods • Explain encapsulation and java modifiers • Explore the details of method declarations • Review method invocations and parameter passing • Explain and use method overloading • Learn to divide complicated methods into simpler, supporting, methods • Describe the relationships between objects • Create graphics-based objects

SECOND SEMESTER	
1,2,3,4	**Enhancing Classes** • Define reference aliases • Explore passing object references as parameters • Learn to use the static modifier • Define formal interfaces and their class implementation • Define nested classes and inner classes • Learn about basic graphical user interfaces
5,6,7,8,9	**Arrays** • Define and user arrays • Describe how arrays and array elements are passed as parameters • Explore how arrays and other objects can be combined to manage complex information • Explore searching and sorting with arrays • Learn to use multidimensional arrays • Examine the ArrayList class
10,11,12,13	**Inheritance** • Derive new classes from existing ones • Explain how inheritance supports software reuse • Add and modify methods in child classes • Discuss how to design class hierarchies • Define polymorphism and how it can be done • Examine and use the GUI component class hierarchy
14,15,16	**Recursion** • Explain the underlying ideas of recursion • Examine recursive methods and processing steps • Define infinite recursion and discuss ways to avoid it • Explain when recursion should and should not be used • Demonstrate the use of recursion to solve problems • Examine the use of recursion in sorting
17,18,19	**Practice, Practice, Practice** • Practice for AP Exam • Final Project