Glendale Unified School District

High School

May 16, 2023

Department:	Career & Technical Education
Course Title:	Applied Computer Programming
Course Code:	3200V/3201V
Grade Level:	10-12
Course Credits:	10
School(s) Course Offered:	Glendale High School, Crescenta Valley High School, Clark Magnet High School
UC/CSU Approved?	Yes, "G" Elective
Recommended Prerequisite:	
Recommended AP Textbook:	*Java Methods Object-Oriented Programming and Data Structures*, 3rd Edition by Maria Litvin and Gary Litvin
Course Overview:	This course provides students with the fundamental knowledge of computer programming for solving applied problems. Topics covered include using various programming languages, protocols, language syntax, data structures, object-oriented concepts, interfaces, sorting and searching algorithms, and developing reports. Also covered, software testing, debugging, and improvement, integrated development using object-oriented programming and sensory information from robots to solve problems and meet challenges integrating STEM subjects.

Course Content

Unit 1: Primitive Type Variables   (3-4 Weeks)
Anchor Standards: 5.1-5.10
Pathway Standards: C1.0-C1.6, C2.0-C2.5
Academic Standards: Language Standards 11-12.1, 11-12.2, Reading Standards 11-12.3, 11-12.7
Writing Standards 11-12.2, 11-12.3, 11-12.4, 11-12.5, 11-12.6, 11-12.8, 11-12.9

   A. The unit consists of the following topics: variables and data types, expressions and
      assignment statements, compound assignment operators, casting and ranges of
      variables.
   B. Create primitive variables. Cast variables from one form to another.

Unit 2: Using Objects   (3-4 Weeks)
Anchor Standards: 5.1-5.10, 10.1-10.14
Pathway Standards: C1.0-C1.6, C2.0-C2.5, C4.0-C4.11, C5.0-5.6
Academic Standards: Language Standards 11-12.1, 11-12.2, Reading Standards 11-12.3, 11-12.7
Writing Standards 11-12.2, 11-12.3, 11-12.4, 11-12.5, 11-12.6, 11-12.8, 11-12.9

   A. The unit consists of the following topics: instance of classes, creating and storing objects
      (Instantiation), calling a void method, calling a void method with parameters, calling a
      non-void method, String objects- concatenation and literals, String methods, wrapper
      classes (Integral and Double) and using the Math Class from the JAVA API.
   B. Create objects and methods using primitive times. Call void and non-void methods.

Unit 3: Boolean Expressions and if-Statements   **(**3-4 Weeks)
Anchor Standards: 5.1-5.10,
Pathway Standards: C1.0-C1.6, C2.0-C2.5, C4.0-C4.11, C5.0-5.6
Academic Standards: Language Standards 11-12.1, 11-12.2, Reading Standards 11-12.3, 11-12.7
Writing Standards 11-12.2, 11-12.3, 11-12.4, 11-12.5, 11-12.6, 11-12.8, 11-12.9

   A. The unit consists of the following topics: Boolean expressions, if-statement and control
      flow, if-else-statements, else-if-statements, compound Boolean expressions, equivalent
      Boolean expression and comparing objects.
   B. Create Boolean expressions, use if statements and control flows in methods and classes.

Unit 4: Iteration   (3-4 Weeks)
Anchor Standards: 5.1-5.10, 10.1-10.14
Pathway Standards: C1.0-C1.6, C2.0-C2.5, C4.0-C4.11, C5.0-5.6
Academic Standards: Language Standards 11-12.1, 11-12.2, Reading Standards 11-12.3, 11-12.7
Writing Standards 11-12.2, 11-12.3, 11-12.4, 11-12.5, 11-12.6, 11-12.8, 11-12.9

A. The unit consists of the following topics: while loops, for loops, developing algorithms using strings, nested iterations and informal code analysis.
B. Create and use while- and for-loops. Create and use nested while- and for-loops

Unit 5: Writing Classes   (3-4 Weeks)
Anchor Standards: 5.1-5.10, 10.1-10.14
Pathway Standards: C1.0-C1.6, C2.0-C2.5, C4.0-C4.11, C5.0-5.6
Academic Standards: Language Standards 11-12.1, 11-12.2, Reading Standards 11-12.3, 11-12.7
Writing Standards 11-12.2, 11-12.3, 11-12.4, 11-12.5, 11-12.6, 11-12.8, 11-12.9

A. The unit consists of the following topics: anatomy of a class, constructors, documentation with comments, accessor methods, mutator methods, writing methods, static variables and methods, scope and access and "this" keyword.
B. Create and use classes, with appropriate constructors and methods. Overload constructors and methods.

Unit 6: Arrays   (3-4 Weeks)
Anchor Standards: 5.1-5.10, 10.1-10.14, 8.1-8.8, 11.1-11.5
Pathway Standards: C1.0-C1.6, C2.0-C2.5, C4.0-C4.11, C5.0-5.6, C8.0-C8.8
Academic Standards: Language Standards 11-12.1, 11-12.2, Reading Standards 11-12.3, 11-12.7
Writing Standards 11-12.2, 11-12.3, 11-12.4, 11-12.5, 11-12.6, 11-12.8, 11-12.9

A. The unit consists of the following topics: array creation and access, traversing arrays, enhanced for-loops for arrays and developing algorithms using arrays.
B. Create and initialize arrays. Enhanced for-loops for arrays.

Unit 7: ArrayList Objects   (3-4 Weeks)
Anchor Standards: 5.1-5.10, 10.1-10.14, 8.1-8.8, 11.1-11.5
Pathway Standards: C1.0-C1.6, C2.0-C2.5, C4.0-C4.11, C5.0-5.6, C8.0-C8.8
Academic Standards: Language Standards 11-12.1, 11-12.2, Reading Standards 11-12.3, 11-12.7
Writing Standards 11-12.2, 11-12.3, 11-12.4, 11-12.5, 11-12.6, 11-12.8, 11-12.9

A. The unit consists of the following topics: introduction to ArrayList objects, ArrayList methods, traversing ArrayLists, developing algorithms using ArrayLists, searing, sorting, security issues around data collections.
B. Create algorithms that include ArrayLists. Modify and sear array.

Unit 8: Two-Dimensional Arrays   (3-4 Weeks)
Anchor Standards: 5.1-5.10, 10.1-10.14, 8.1-8.8, 11.1-11.5
Pathway Standards: C1.0-C1.6, C2.0-C2.5, C4.0-C4.11, C5.0-5.6, C8.0-C8.8
Academic Standards: Language Standards 11-12.1, 11-12.2, Reading Standards 11-12.3, 11-12.7
Writing Standards 11-12.2, 11-12.3, 11-12.4, 11-12.5, 11-12.6, 11-12.8, 11-12.9

A. The unit consists of the following topics: Introduction to two-dimensional arrays, creating and storing two-dimensional, traversing two-dimensional arrays, sorting two-dimensional, linear algebra, tensors and vector operations, finite and infinite series and summation, chaos theory and Monte Carlo simulations.
B. Create and fill two-dimensional arrays. Sort and search two-dimensional arrays.

Unit 9: Inheritance   (3-4 Weeks)
Anchor Standards: 5.1-5.10, 10.1-10.14, 7.1-7.8,9.1-9.7, 10.1-10.14, 11.1-11.5
Pathway Standards: C1.0-C1.6, C2.0-C2.5, C4.0-C4.11, C5.0-5.6, C8.0-C8.8
Academic Standards: Language Standards 11-12.1, 11-12.2, Reading Standards 11-12.3, 11-12.7
Writing Standards 11-12.2, 11-12.3, 11-12.4, 11-12.5, 11-12.6, 11-12.8, 11-12.9

A. The unit consists of the following topics: creating superclasses and subclasses, writing constructors and subclasses, overriding methods, "super" keyword, creating references using inheritance hierarchies, polymorphism and object superclass.
B. Create superclasses. Create subclasses.

Unit 10: Recursion   (3-4 Weeks)
Anchor Standards: 5.1-5.10, 10.1-10.14, 7.1-7.8,9.1-9.7, 10.1-10.14, 11.1-11.5
Pathway Standards: C1.0-C1.6, C2.0-C2.5, C4.0-C4.11, C5.0-5.6, C8.0-C8.8,
Academic Standards: Language Standards 11-12.1, 11-12.2, Reading Standards 11-12.3, 11-12.7
Writing Standards 11-12.2, 11-12.3, 11-12.4, 11-12.5, 11-12.6, 11-12.8, 11-12.9

A. The unit consists of the following topics: introduction to recursion, recursive searching and sorting.
B. Sort recursively. Search recursively.