Course Title: AP Computer Science Principles

Course #: 3758-3759

Course Description:
The AP Computer Science Principles course is designed to be equivalent to a first-semester introductory college computing course. The course introduces students to the foundational concepts of computer science and challenges them to explore how computing and technology can impact the world. With a unique focus on creative problem solving and real-world applications, AP Computer Science Principles prepares students for college and career. 
Students are strongly encouraged to take the AP Exam in May.

UC/CSU Approval: “g” approved

Grade Level: 10-12

Estimated Homework Per Week: 1 hour per week
This is a general guideline for planning and scheduling purposes. A student’s ability level may affect actual preparation time needed.

Prerequisite: Completion of Algebra 2 with a grade of “C” or higher OR Concurrent enrollment in Algebra 2 and completion of Intro to Computer Programming with a grade of “B” or higher

Recommended Prerequisite Skills: Logic, Problem Solving

Course Grade Scale:
- Assessments: 35%
- Final Assessment: 15%
- Homework & Classwork: 50%
Major Assessments/Units/Topics:
*Assessments per unit: 1-2 Quizzes, 1 Unit Test, In-class Activities

Unit 1: The Internet
   Representing and Transmitting Information
   - Bits and Binary Messages
   - Abstract Number Systems
   - Encoding Numbers and Text
   Inventing the Internet
   - IP Addresses, Packets, and Redundancy
   - Routing, DNS, Protocols, and Abstraction

Unit 2: Digital Information
   Encoding and Compressing Complex Information
   - Encoding Images
   - Lossless and Lossy Compression
   Manipulating and Visualizing Data
   - Visualizations, Trends, and Assumptions
   - Cleaning and Summarizing Data

Unit 3: Algorithms & Programming
   Algorithms
   - The Need for Algorithms
   - Designing Algorithms
   Programming
   - Programming Languages
   - Procedural Abstraction & Top-Down Design
   - Loops and Iteration

Unit 4: Big Data & Security
   Implications of Big Data
   - Big Data in the Real World
   - Identifying People and the Cost of “free”
   Encryption & Security
   - Foundations of Encryption
   - One-Way Functions
   - Asymmetric and Public Key Encryption
Unit 5: Building Applications

Event-Driving Programming
- Designing Event-Driving Applications
- User Input and Variables
- Boolean Logic and Conditionals

Programming with Data Structures
- While Loops
- Simulations
- Arrays Functions with Return Values
- Processing Array

Unit 6: Performance Tasks

Create Performance Task
- 12-hr AP Create Performance Task

Explore Performance Task
- 8-hr AP Explore Performance Task