Fremont STEM
Tutoring | Hands-On Science | Consulting

Course Syllabus

AP Computer Science A | Summer 2021

Objectives:
- Introduce Object Oriented Programming (OOP) principals using the Java language.
- Prepare the student to successfully take the AP Computer Science A Exam.

Prerequisites: Prior programming is not required but will be helpful.

Instructor Contact Information:
Primary Instructor: Larry McMahan   larry.mcmahan@fremontstem.com

Website:
All course materials (waiver, syllabi, etc.) will be posted on the course website under "AP Computer Science." In addition, class materials and assignments will be posted in a Google classroom for the course (classroom.google.com).

Class Times:
M W F 6:30 – 8:00 PM. We can skip class on either 7/2 or 75 for holiday. Students' choice.

Required Materials:
- Students are required to have a PC, Mac, or similar computer. Students are required to install the Java Development Kit from Oracle (free) and ensure that it works before the first class period.
- Links to PDFs and online resources will be provided in class.

Reference Material: Barron's Computer Science A, Nineth Edition.

Homework: Homework that is assigned is strongly recommended. Answer keys will be available online the day the homework assignment is due. For help on practice problems, feel free to email the instructor.

Tentative Nature of the Syllabus: The contents of this syllabus and attached schedule are tentative in nature and may be subject to change or revision. The instructor holds the right to make changes to the schedule and/or organization of the class as necessary. Students and parents will be identified of any changes via email.

Special Accommodations: If your student requires special accommodations, please notify the instructor as soon as possible.

Tentative Schedule

Date	Topic
6/21	1. Introduction - Computer Architecture and Organization, Object Oriented Programming
6/23 - 6/25	2. Java Language Features – Types and Identifiers, Operators, Input/Output, Statements and Control Structures, Iterators
6/28	3. Classes and Objects – Classes, Objects, Instantiation, Public/Private/Static Attributes, Methods, Scope of objects, References
6/30 – 7/2 or 5	4. Inheritance and Polymorphism – Superclass and Subclass, Inheritance Hierarchy, Dynamic Binding, Method Names, Type Compatibility
7/7	5. Standard Java Classes – Object Class, String Class, Wrapper Classes, Math Class
7/9	6. Program Design and Analysis – Order of Program Design and Testing, Object Oriented Design Techniques, Program Analysis
7/12	7. Arrays and Array Lists – One Dimensional Arrays, Array Lists, Two Dimensional Arrays
7/14 - 7/16	8. Recursion – Recursive Methods, Simple Recursion, Types of Recursion, Sorting with Recursion, Recursion in Two Dimensional Grids.
7/19 – 7/21	9. Sorting and Searching – Iterative Sorts: Selections and Insertions, Recursive Sorts: Merge Sort and Quicksort, Sequential Search, Binary Search.
7/23	10. Labs – Magpie Lab Emphasis, Elevens Lab Emphasis, Picture Lab Emphasis
7/26 – 7/28	11. Preparing for the AP Exam
7/30	12. Advanced Topics – Lists, Queues, Stacks, Trees (will not be on exam)

Note: Schedule is tentative in nature and subject to change at the instructor's discretion.