

# CFISD Computer Science III K

## Scope and Sequence

**Course Description:**

Computer Science III K is a continuation of Computer Science II AP A and builds upon such topics as object-oriented programming, inheritance, and classes. Students go on to address advanced topics such as stacks, queues, advanced recursion, linked lists, binary trees, and advanced sorting, and searching topics in preparation for and alignment with college-level computer science.

- Grades 11 and 12
- Required prerequisite: Computer Science II K
- Satisfies advanced course requirement for STEM endorsement
- Oracle Java SE 8 and MTA Introduction to Programming Using Java certifications satisfy the requirement to earn a performance acknowledgement.
- Lab supplies or fee may be required.

TEKS

Cluster: STEM / Information Technology

Endorsement: STEM / Business & Industry

- Meets advanced course requirement (Y/N): Y
- Meets foundation requirement for math, science, fine arts, English, LOTE (Y/N-area): Y LOTE

Industry Certification/Credentials: Oracle Certified Associate Java SE 8 Programmer, Microsoft Technology Associate Introduction to Programming Using Java

Instructional Units	Pacing
Unit 1: User interfaces <ol style="list-style-type: none"> <li>1. Design</li> <li>2. Events</li> </ol> Unit 2: Sorting and Searching Algorithms and Advanced Two-Dimensional Arrays <ol style="list-style-type: none"> <li>1. Matrices</li> <li>2. Matrix operations</li> <li>3. Ragged Arrays</li> </ol> Unit 3: Collections Sets <ol style="list-style-type: none"> <li>1. Hash Tables</li> <li>2. Hash Set</li> <li>3. Iterator</li> <li>4. Trees Set</li> </ol> Unit 4: Collections Maps <ol style="list-style-type: none"> <li>1. Hash Map</li> <li>2. Views</li> <li>3. Tree Maps</li> <li>4. Multi-Maps</li> </ol>	1 <sup>st</sup> grading period
Unit 5: Stacks and Queues <ol style="list-style-type: none"> <li>1. Stacks</li> <li>2. Stack Algorithms</li> <li>3. Queues</li> <li>4. Queue Algorithms</li> <li>5. Priority Queue</li> </ol> Unit 6: Linked Lists <ol style="list-style-type: none"> <li>1. Basic Notation</li> </ol>	2 <sup>nd</sup> grading period

Rev Fall, 2019

Instructional Units	Pacing
2. Linked List Algorithms 3. API Class Design Unit 7: Linked Lists (Advanced) 1. Reverse 2. Double 3. Circular	
Unit 8: Advanced Recursion 1. Fractals Unit 9: Binary Trees 1. Iterate 2. Traversal 3. Insertion 4. Deletion 5. Heap Unit 10: Graph Theory 1. Adjacency matrix 2. Breadth-First-Search / Depth-First-Search	3 <sup>rd</sup> grading period
Year End Project (Choice) 1. Robotics 2. Game Design and Theory 3. Mobile Apps 4. Client Server Connectivity	4 <sup>th</sup> grading period

Primary Instructional Materials: Java

Secondary Instructional Materials, depending on project: Lego Mindstorm robots, App development tools