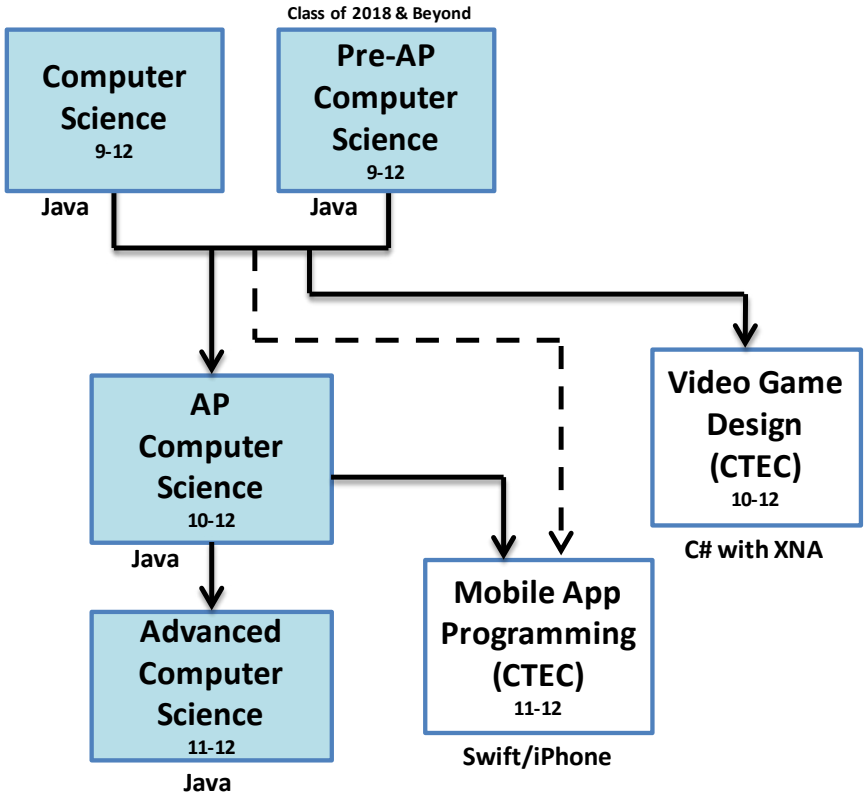
FRISCO ISD

Computer Science

2016-17



Course Descriptions

Computer Science (Level 1)

9th – 12th grade (1 credit)
Prerequisite: Geometry or concurrent enrollment

This is a beginner's level approach to computer programming using the Java language. No previous knowledge of programming is necessary. Students will develop and apply algorithms to solve real-world problems. Programming concepts will be taught using structured programming techniques such as data types, program input/ output, if statements, loops, arrays, and lists. Object-oriented programming will also be introduced. Other topics include debugging, hardware components, and social implications of computer systems. Upon completion of this course, the student will have created software programs using computer science programming concepts. This course may count as a Technology Applications course.

Pre-AP Computer Science (Level 1)

9th – 12th grade (1 credit)
Prerequisite: Geometry or concurrent enrollment

Pre-AP CS covers the same topics as on-level Computer Science but in greater depth and rigor. No previous knowledge of programming is necessary; however students need excellent reasoning abilities and problem solving skills. Object-oriented concepts will receive more emphasis. This course is designed as a preparation for programming at the college level. This course may count as a Technology Applications course.

AP Computer Science (Level 2)

10th – 12th grade (1 credit)
Prerequisite: Computer Science

This course continues the study of computer programming using the Java language. Object oriented programming and class design will be studied in depth. Topics include 2D arrays, searching and sorting algorithms, and recursion. Social and ethical ramifications of computer in society will also be addressed. Programming

assignments will, in general, be more extensive, and include the use of case studies. This course is intended for students who want to pursue careers in computer science, mathematics, engineering, or science. This college level course prepares students for the Advanced Placement Computer Science "A" Exam. This course may qualify as a fourth mathematics credit towards graduation.

Advanced Computer Science (Level 3)

11th – 12th grade (1 credit)
Prerequisite: AP Computer Science

This course continues the study of computer programming using Java. Students must have mastered the topics in AP CS. This mastery is needed for CS3's study of classic data structures including linked lists, stacks, queues, trees, heaps, priority queues, and their application to algorithms such as quick sort and heap sort. Students will also be introduced to graph theory and extend their knowledge of recursive algorithms. Other topics may be included, such as advanced GUI techniques, multi-threaded programs, networked applications, and number theory.

Video Game Design

10th –12th grade (CTEC) (1 credit)
Prerequisite: Computer Science, PAP Computer Science or AP Computer Science

Students will learn game design and programming concepts. Students must have mastered the topics previously covered in Computer Science. This mastery is needed for study of programming topics including: game state and the game loop, basic display and interaction of on-screen objects, user interface design, and 2D side scrolling techniques. Students will program using the C# language in the Visual Studio environment. Our primary game platform will be the PC; some students may program for other platforms. Design topics will include: story, mechanics & dynamics, chance, strategy, balance, and level design. Multiple team projects will expose students to the challenges of working in teams and develop interpersonal skills.

Mobile Application Programming

10th – 12th grade (CTEC) (1 credit)
Prerequisite: AP Computer Science, Pre-AP Computer Science, or Computer Science

Students are strongly recommended to complete AP Computer Science before attempting this advanced course. We will apply previously learned object-oriented programming techniques and rules of inheritance (super/sub classes, abstract classes, and interfaces) to Apple's iOS API's. Because of the dynamic nature of development for mobile devices, students will need to be independent learners; most apps will require significant research to complete, and students will work independently and in teams for most of the year. Students will code in the Swift programming language using the Xcode IDE, building apps for devices such as iPhone, iPod Touch, and iPad. Additionally, students will analyze the responsibility of software professionals regarding issues of the environment, ethics, health, safety, and diversity in society and in the workplace.

Career Opportunities

Exploring career options? Seeking out ways to earn money for your skills and talents? There are fascinating job responsibilities and generous pay for those with the right knowledge and skills. Check out these career possibilities and salaries!

- *Software Developer,* $90,000+
- *Video Game Designer,* $76,000+
- *Computer Scientist,* $74,000+
- *Security Analyst,* $79,000+
- *Network Administrator,* $87,000+
- *Computer Engineer,* $88,000+

Web Technologies

10th –12th grade (1 credit)
Prerequisite: Digital Graphics and Animation, or Digital and Interactive Media, or Computer Science

Through the study of web technologies and design, students learn to make informed decisions and apply the decisions to the field of information technology. The knowledge and skills acquired and practiced will enable students to successfully perform and interact in a technology-driven society. Students will learn the abilities to be able to use digital media to plan, design, build, and maintain effective communications. The goal of this class will be for students to gain certification from Adobe Digital Media in software such as Flash and Dreamweaver for a fee. Course is project based and students must be self motivated and willing to put in the time and effort necessary to complete projects. This course may count as a Technology Applications course.

CS courses are in these Endorsement Pathways:
- **Business and Industry–Information Technology**
- **STEM–Computer Science**