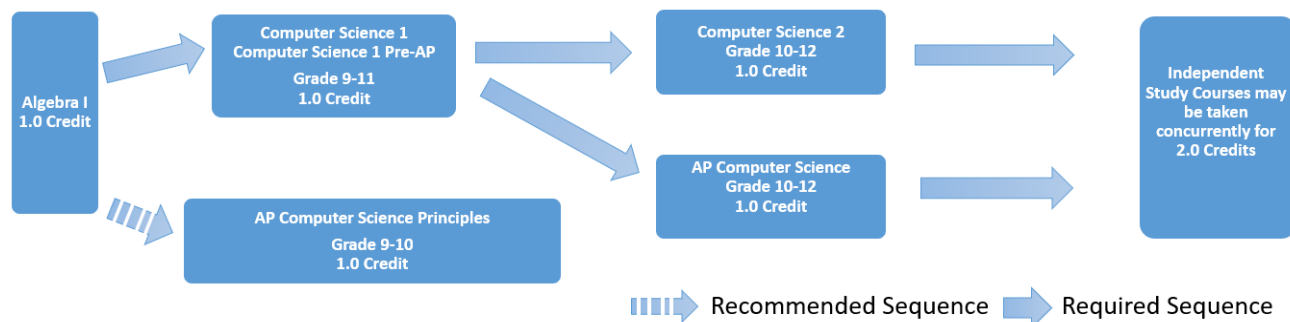


STEM Pathway – Computer Science & Algorithms



COMPUTER SCIENCE 1

KISD #: 4900

Grades: 9-11

Prerequisite:

1 Credit

Algebra 1 and comfortable with uses of functional notation such as $f(x) = x + 2$ and $f(x) = g(h(x))$

Computer Science 1 provides students the opportunity to develop mastery of beginning programming skills using the Java language. Students will examine computer systems and hardware, as well as develop and apply problem solving skills by working to break complex tasks down into smaller, more easily manageable parts that can be solved individually. Students will:

- Use programs such as MIT's Scratch and Green foot to visually represent code and class hierarchies in a graphical 2D environment.
- Develop knowledge and understanding of the different data types available and how to make the appropriate choice of which to use in particular scenarios
- Learn to recognize errors in programs and use strategies to fix these problems

Required Fee/Materials: Yes

Advanced Grade Points: Yes

COMPUTER SCIENCE 1 PRE-AP

KISD #: 4900Q

Grades: 9-11

Prerequisite:

1 Credit

Algebra 1 and comfortable with uses of functional notation such as $f(x) = x + 2$ and $f(x) = g(h(x))$

Pre AP Computer Science 1 will prepare students to take the AP Computer Science course. The course provides students the opportunity to develop mastery of beginning programming skills using the Java language. Students will examine computer systems and hardware, as well as develop and apply problem solving skills by working to break complex tasks down into smaller, more easily manageable parts that can be solved individually. Students will:

- Use the Java programming language to develop and debug computer programs
- Create well structure and documented computer programs
- Learn computer graphics and basic animation
- Collaboratively design and implement computer applications

Required Fee/Materials: Yes

Advanced Grade Points: Yes

COMPUTER SCIENCE 2

KISD #: 4903

Grades: 10-12

Prerequisite:

1 Credit

Computer Science 1 or Computer Science 1 Pre-AP

Computer Science 2 will foster students' creativity and innovation by presenting opportunities to design, implement, and present meaningful programs through a variety of media. Through data analysis, students will identify task requirements, plan search strategies, and use computer science concepts to access, analyze, and evaluate information needed to solve problems.

Required Fee/Materials: Yes

Advanced Grade Points: Yes

Note:

Completion of Computer Science 1 and Computer Science 2 will satisfy the LOTE graduation requirement.

AP COMPUTER SCIENCE

KISD #: 4901

Grades: 10-12

Recommended Prerequisite: Computer Science 1 or Pre-AP Computer Science 1

2 Credits (1 period)

Pre-AP Computer Science 1

The AP Computer Science course is a college level course that offers students the opportunity to master high-level programming language concepts using the Java and basic algorithms. Building on a library of reusable code, students will solve large problems by separating them into modules. The curriculum is structured to meet the course requirements, as stated by The College Board AP Course Description for Computer Sciences, and to prepare students for the Advanced Placement, Computer Science A exam. All students are encouraged to take the College Board Advanced Placement Examination.

Required Fee/Materials: Yes

Advanced Grade Points: Yes

Note:

Completion of AP Computer Science Higher Level will satisfy one advanced mathematics requirement and one LOTE requirement for graduation.

AP COMPUTER SCIENCE PRINCIPLES

KISD #: 4902

Grades: 9-10

1 Credit

Prerequisite:

Algebra 1

This course includes a variety of Computer Science topics to create solutions to various problems, explore the global impact of computers and computers and begin working with databases, algorithms and programming. College credit is available upon successful completion of the AP exam at the end of this course.

Required Fee/Materials: Yes

Advanced Grade Points: Yes

Note: Completion of AP Computer Science Principles will satisfy one LOTE requirement for graduation.

IB COMPUTER SCIENCE SL

KISD #: 3426

Grades: 11-12

1 Credit

Prerequisite:

One credit of computer science

IB computer science explores the breadth and depth of computers and technology related issues. Students will be expected to write programs using an object-oriented approach. Students will be able to trace algorithms in Java and be able to evaluate software designs and algorithms written in Java. Time spent on the program independent assessment is an important part of the course and will be utilized to demonstrate mastery of the programming language of the course (Java). The student will:

- Explore the designing, testing, describing and backing up of computer systems.
- Develop logical thinking in designing software and solving logic problems.
- Discuss the design, variations, problems and uses of networked systems.
- Utilize Object Oriented Design in their programs using the Java programming language.
- Discuss the repercussions of shared computer resources, databases, and human interaction with technology.
- Utilize advanced computer science concepts covered include trees, arrays, recursion, Boolean logic and lists.

Required Fee/Materials: Yes

Advanced Grade Points: Yes

Note: Completion of IB Computer Science SL will satisfy one LOTE requirement for graduation.

IB COMPUTER SCIENCE HL

KISD #: 3428

Grades: 11-12

2 Credits (1 period)

Prerequisite:

One credit of computer science

IB computer science explores the breadth and depth of computers and technology related issues. Students will be expected to write programs using an object-oriented approach. Students will be able to trace algorithms in Java and be able to evaluate software designs and algorithms written in Java. Time spent on the program independent assessment is an important part of the course and will be utilized to demonstrate mastery of the programming language of the course (Java). The student will:

- Explore the designing, testing, describing and backing up of computer systems.
- Develop logical thinking in designing software and solving logic problems.
- Discuss the design, variations, problems and uses of networked systems.
- Utilize Object Oriented Design in their programs using the Java programming language.
- Discuss the repercussions of shared computer resources, databases, and human interaction with technology.
- Utilize advanced computer science concepts covered include trees, arrays, recursion, Boolean logic and lists.

Required Fee/Materials: Yes

Advanced Grade Points: Yes

Note: Completion of IB Computer Science Higher Level will satisfy one advanced mathematics requirement and one LOTE requirement for graduation.

TECHNOLOGY APPLICATIONS

INDEPENDENT STUDY

KISD #: 4907

Grades: 11-12

1 Credit

Prerequisite:

2 credits in this pathway

The Technology Applications Independent Study course is a project-based course for students to research and develop high-level programming language concepts. Students will build portfolios, solve problems, and create products for school and community. Design principles and software skill sets should be interwoven into real products.

Required Fee/Materials: Yes

Advanced Grade Points: Yes

EVOLVING AND EMERGING TECHNOLOGIES

INDEPENDENT STUDY

KISD #: 4936

Grades: 11-12

1 Credit

Prerequisite:

Technology Applications
Independent Study or Concurrent
Enrollment

The Independent Study, Evolving and Emerging Technologies is the culminating course in the pathway. This project-based course provides opportunities for students to research and develop evolving and emerging technologies. Students will build portfolios, solve problems, and create products for school and community. Design principles and software skill sets should be interwoven into real products.

Required Fee/Materials: Yes

Advanced Grade Points: Yes