

Department: Science / Math

Course Name: Computer Programming in Python

Course Description:

This year-long class introduces Java based computer programming. This class is offered as an online course offered through Project Stem. Computer programming is a self-paced on-line class requiring 5-7 hours of work per week and requires a dedicated block for this course. According to Project Stem, “in *Computer Programming*, students will learn the fundamentals of computer science using the Python programming language. Python is a modern, object-oriented programming language used to create professional software. The course will explore systematic problem-solving strategies that can be applied to real world problems. The focus will be first on programming basics and then on writing full classes and the logic and structures around building them.” Grades will be assessed through projects, quizzes, exams, and classroom work. Class is offered as either a math or science elective. There is fee of approximately \$100 for this class.

Content:

Intro to Python

Conditionals and Loops

Strings and One Dimensional Arrays

Methods

User-Defined Classes

Advanced Classes

Algorithms

Skills:

Design and implement solutions to problems by writing, running, and debugging computer programs.

Develop and select appropriate algorithms and data structures to solve problems.

Code fluently using the programming language Python.

Text and Materials:

Project Stem online manual

Methods of Instruction:

The primary language for the course is Python. The course will consist of video lectures, daily programming exercises, longer coding assignments, regular quizzes, projects and exams. Students will also participate in online discussion forums. One major element of the content is the Code Along videos. In these videos, students are asked to follow along with the instructor as they code. By coding in small chunks and pausing and repeating segments as necessary students are able to work through new topics at their own pace and work towards mastery of the material. As they master these techniques, they are asked to combine them in longer exercises that let them build a deeper understanding of computer science and programming. Regular quizzes and tests give them feedback on their progress.

Methods of Evaluation:

Tests

Quizzes

Class projects