

**Teacher** Long Nguyen

**Room 306**

**Email lnguyen8@bostonpublicschools.org**

**Class Website** [**https://longbaonguyen.github.io/courses/apcsp/apprinciples.html**](https://longbaonguyen.github.io/courses/apcsp/apprinciples.html)

**Course Name AP Computer Science Principles**

**Course Description**

*The proposed syllabus is for a year-long course. The course will introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns, and computing impacts. AP Computer Science Principles also gives students the opportunity to use current technologies to create computational artifacts for both self-expression and problem solving. Together, these aspects of the course make up a rigorous and rich curriculum that aims to broaden participation in computer science.*

**Units of Study**

*1) Programming and Algorithms(Python)*

*2) Creative Development*

*3) Understanding Data*

*4) Computer Systems and Networks*

*5) Cybersecurity and Cryptography*

*6) Impact of Computing*

**Essential Questions**

**● How are vastly different kinds of data, physical phenomena, and mathematical concepts represented on a computer?**

**● Why are some languages better than others when used to implement algorithms?**

**● How are programs used for creative expression, satisfy personal curiosity, or to solve problems?**

**● Which mathematical and logical concepts are fundamental to computer programming?**

**● How does computing enhance human communication, interaction and cognition?**

**● How can data such as images, audio and videos be programmatically processed?**

**● How do data packets travel across the internet?**

**● How are algorithms analyzed for efficiency?**

**● What are some security and privacy concerns in a networked world?**

**Content-Specific Objectives**

Students will be able to show understanding of the following:

* *Write a program to solve a specific problem.*
* *Explain how abstractions can be used to write complicated programs.*
* *Use Python to process data including images, audio and text.*
* *Explain how the different protocols such as TCP/IP, HTTP, etc... make internet work.*
* *Explain the computational complexity of searching, sorting algorithms.*
* *Explain different cybersecurity concerns such as phishing, social engineering and SQL injection.*
* *Use control and data structures to develop useful algorithms.*

**Core Competencies**

*BLS identified eight essential competencies that span all content areas and grade levels. Students will engage with subject matter and reach proficiency in their coursework by practicing the following skills and by living out the listed values.*

* **Reading:** Students will utilize higher order thinking skills as they read authentic material from a variety of perspectives, cultures, and disciplines.
* **Writing:** Students will write competently and creatively, having mastered language conventions including rhetorical, stylistic, and grammatical structures.
* **Speaking and Presenting:** Students will communicate clearly and effectively in prepared and extemporaneous speech.
* **Researching:** Students will generate questions and use informed research and technological methodologies to evaluate information and synthesize new and innovative ideas.
* **Problem Solving:** Students will develop and exercise sound diagnostic and creative skills in addressing complex challenges.
* **Social Responsibility:** Students will be open-minded, respectful, responsible and engaged members of the school community.
* **Civic Engagement:** Students will utilize leadership skills through active community involvement and advocacy.
* **Global Awareness:** Students will demonstrate their global understanding and growth as engaged global citizens.

*We also aim to foster the following social emotional (CASEL) competencies through students’ holistic BLS experiences:*

* **Self-Awareness:** Students will identify triggers for emotions, label and recognize one’s emotions, analyze how their emotions affect others.
* **Self-Management:** Students will seek help when needed, set goals, monitor progress toward goals, self-advocate, and use feedback positively.
* **Social Awareness:** Students will read social cues, understand others’ points of view, feelings, and reactions, appreciate diversity and equity.
* **Relationship Management:** Students will make friends, engage in cooperative learning, communicate effectively, and provide help to others.
* **Responsible Decision-Making:** Students will reflect on how choices affect their futures, implement problem skills, and use strategies to resist peer pressure.

**Primary Texts**

*No textbook. The curriculum for the course can be found on the class website:*

[*https://longbaonguyen.github.io/courses/apcsp/apprinciples.html*](https://longbaonguyen.github.io/courses/apcsp/apprinciples.html)

**Assessments**

***Students will be assessed using quizzes on AP Classroom from the College Board as well as in-class exams.***

**Grading**

Grades will be based on a total point system. Each term, the number of points is 400. There will be three exams per term for a total of 300 points. Homework including worksheets, AP exam practice problems, labs and projects will be 100 points. The final year-end grade will be the average of the four terms.

Final Grade: 1st term 25%, 2nd term 25%, 3rd term 25%, 4th term 25%

**Classroom Expectations**

Students are expected to behave in accordance with the Code of Conduct and Standards of Behavior in the Boston Public Schools as outlined in the Boston Latin School Handbook. Should there be occasion to engage in virtual learning over the course of this school year, students are held to the same classroom expectations as in-person learning.

**Expectation of Academic Honesty**

A core value at BLS is to embody excellence through our efforts and deeds. A component of this is academic honesty and integrity. Students are expected to adhere to the rules regarding cheating and all forms of plagiarism as outlined in the Boston Latin School Handbook. The reporting of cheating and plagiarism is not discretionary. Teachers must report all instances of plagiarism to Program Directors for further action.

**Supplies**

A desktop or laptop with Linux/Windows/Mac operating systems is preferred. However, Chromebooks will also be sufficient. Desktops will be available for daily in-class use.

A thin(1-inch) 3-holed binder to store worksheets and lecture notes assignments.

**Office Hours**

For students: My Day 1 R4, R7 are either a free or a study. Please let me know ahead of time to see me at those times. I am also free Tuesdays and Thursdays after school. This is by appointment only. For parents: Please email me to schedule an appointment.

**Receipt of this course overview via submission on Google classroom indicates understanding of the information above.**

**STUDENT NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ID#:\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Acknowledgement of Course Overview**

***Students and Guardians:***

*Please read the above information for AP Computer Science Principles together, and indicate by your signatures on this page that you understand the purpose, format, and expectations of this course. Please return this document to me and keep the agreement for your own reference. Please feel free to see, call, or email me with any questions or comments you might have*.

***Student:***

*I have read and I understand the course description and classroom expectations for AP Computer Science Principles. I also understand that I will be held accountable for the return of any loaned instructional materials at the end of this school year.*

Student signature(type your name) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student email\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Parent:***

*I have reviewed the course description and classroom expectations for AP Computer Science Principles with my student.*

Parent/Guardian signature(type your name)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_

Parent/Guardian email\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Parent/Guardian phone/s\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_