

Ola High School

HIGH SCHOOL COURSE SYLLABUS

COURSE TITLEAP / **Computer Science Principles** **TERM****2024-2025**

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Teacher Support	Help sessions are available after school by appointment

COURSE DESCRIPTION

Demonstrate and build your problem-solving ability all while connecting the relevance of computer science to society! Computer Science (CS) Principles is an intellectually rich and engaging course that is focused on building a solid understanding and foundation in computer science. This course emphasizes the content, practices, thinking and skills central to the discipline of computer science.

Through both its content and pedagogy, this course aims to appeal to a broad audience. The focus of this course will fall into these computational thinking practices: connecting computing, developing computational artifacts, abstracting, analyzing problems and artifacts, communicating, and collaborating. Various forms of technologies will be used to expose students to resources and application of computer science. Professional communication skills and practices, problem-solving, ethical and legal issues, and the impact of effective presentation skills are enhanced in this course to prepare students to be college and career ready.

Employability skills are integrated into activities, tasks, and projects throughout the course standards to demonstrate the skills required by business and industry. Competencies in the co-curricular student organizations are integral components of both the employability skills standards and content standards for this course. Computer Science Principles is the second course in the Programming, Game Design, Internet of Things, Web Development, Cloud Computing, and Computer Science pathways in the Information Technology Cluster. Students enrolled in this course should have successfully completed Introduction to Software Technology.

COURSE CURRICULUM CONTENT

COURSE STANDARDS

IT – CSP-1	Demonstrate employability skills required by business and industry.
IT – CSP-2	Create digital artifacts that foster creative expression including programs, digital music, videos, images, documents, and combinations of these such as infographics, presentations, and web pages
IT – CSP-3	Apply abstractions in digital data to explain how bits are grouped to represent higher level abstractions, such as numbers and characters.
IT – CSP-4	Design and create computer programs to process and extract information to gain insight and knowledge
IT – CSP-5	Develop, express, implement, and analyze algorithms analytically and empirically.
IT – CSP-6	Create programs that translate human intention into computational artifacts including music, images, visualizations, and more while exploring the concepts, techniques and development used in writing programs.
IT – CSP-7	Gain insight into the operation of the Internet, study characteristics of the Internet and systems built upon it, and analyze important concerns, such as cybersecurity.
IT – CSP-8	Develop a logical argument from the many ways in which computing enables innovation and our methods for communicating, collaborating, problem solving, and doing business, and analyze the potential benefits and harmful effects of computing in the way people think, work, live, and play.
IT – CSP-9	Review and update personal online career portfolio
IT – CSP-10	Explore how related student organizations are integral parts of career and technology education courses through leadership development, school and community service projects, entrepreneurship development, and competitive events.

UNITS/TOPICS

Unit 1 - Digital Information

This unit explores the technical challenges and questions that arise from the need to represent digital information in computers. Learn how complex information like numbers, text, images, and sound are represented in text, how compression works, and the broader social impacts of digitizing the world's information.

Unit 2 - The Internet

This unit reveals how the Internet was designed to connect billions of devices and people to one another. Learn how the different protocols of the Internet work and actually build them yourself using the Internet Simulator. Then consider the impacts the Internet has had, both good and bad, on modern life.

Unit 3 - Intro to App Design

This unit is an introduction to programming and app design with a heavy focus on important skills like debugging, pair programming, and user testing. Learn how to design user interfaces and write event-driven programs in App Lab and then design a project that teaches your classmates about a topic of your choosing.

Unit 4 - Variables, Conditionals, and Functions

This unit explores how variables, conditionals, and functions allow for the design of increasingly complex apps. Learn how to program with these three new concepts through a sequence of collaborative activities. Then build your own decision maker app to share with friends and help them make a decision.

Unit 5 - Data

In this unit learn how data analysis helps turn raw data into useful information about the world. Learn how to use data visualization to find patterns inside of data sets and learn how this data analysis process is being used in contexts like open data or machine learning to help make decisions or learn more about our world. In the unit project, you'll analyze a dataset of your choosing and present your findings.

Unit 6 - Lists, Loops, and Traversals

This unit introduces lists, loops, and traversals, and explores the way they can be used to build apps that store and process large amounts of information. Learn to program with the data library in App Lab, and design a program about any topic of your choosing.

Unit 7 - Parameters, Return, and Libraries

This unit introduces parameters, return, and libraries. Learn how to use these concepts to build new kinds of apps as well as libraries of code that you can share with your classmates. End the unit by designing a library of functions around any topic of your choosing.

Unit 8 - Cybersecurity and Global Impacts

In this unit learn how computing innovations have impacted our world in beneficial and harmful ways. Learn how data can pose a threat to our privacy and security and the ways that encryption and other techniques are used to protect it. Throughout the unit participate in a "school of the future" conference in which you and a team make a proposal for how best to improve school life with computing innovations.

Unit 9 - Create PT Prep

In this unit prepare for, and do the AP Create Performance Task. Each lesson contains links to helpful documents and activities to help you understand the task and develop a plan for completing it.

Unit 10 - Algorithms

This unit is a quick exploration of how computer scientists design algorithms to solve problems and how they analyze the speed of different algorithms. Learn about the concept of algorithmic efficiency through a variety of hands-on activities and learn how it's being applied in modern computing.

INSTRUCTIONAL MATERIALS AND SUPPLIES

Instructional Supplies

paper, pen or pencil, headphones

EVALUATION AND GRADING

Assignments	Grade Weights	Grading Scale
Classwork & Homework	Class: Assessments 40%	A: 90 and above
Projects	Daily Work, Quizzes	B: 80 – 89
Unit Tests	Summative: Assessment 40%	C: 74 – 79
Quizzes	Projects, Unit Tests	D: 70 – 73
Final Exam	<hr/> Class Work 80%	F: 69 or below
	Final Exam 20%	

OTHER INFORMATION

Expectations for Academic Success	Additional Requirements/Resources
<ol style="list-style-type: none">1) Complete daily classwork assignments2) Participate in class discussions and ask questions3) Participate constructively as a team member4) Problem solve and accept challenges5) Challenge yourself to continuously improve	<ul style="list-style-type: none">• Acceptable Computer Use Policy• Tutoring Available• Various online accounts for participation

Employability Skills:

All classes within the pathway stress the importance of students learning and demonstrating appropriate and professional behavior. We refer to these intangible traits as “employability skills”. Students are provided more freedom to perform work and learn in teams in and outside the traditional classroom, but they are also held to a higher standard when it comes to behavior. Examples of unacceptable behavior that will result in discipline action include but are not limited to:

- ✦ MISUSE OR USE OF CELL PHONE OR OTHER ELECTRONIC DEVICE INAPPROPRIATELY
- ✦ Taking other student’s property
- ✦ Inappropriate use of school equipment
- ✦ Non-Participation / Sleeping During Class
- ✦ Disrespectful behavior towards teacher or classmates

Rules & Class Conduct:

Primary classroom rules are:

- ✦ Cell phones are PUT AWAY or secured.
- ✦ Food and Drink (with the exception of water) are prohibited in the classroom.
- ✦ All book bags / back packs should be placed in the designated area upon entering the classroom and should not be on desks or lab tables.
- ✦ Unsafe behavior such as pushing others, throwing things or horseplay, will not be tolerated.
- ✦ Students are encouraged to actively participate in all discussions and remain respectful to their peers, the instructor and guest speakers.

Consequences for Inappropriate Behavior:

- 1st Offense Verbal warning from teacher
- 2nd Offense Verbal warning from teacher and email or phone call home to parents
- 3rd Offense Discipline referral to Administrator

*Violations of school policies such as inappropriate language, dress code, fighting, skipping class, drugs or weapon possession or other serious offenses will be immediately referred to school administrators for appropriate discipline without warning(s).

The syllabus may be updated as needed throughout the year.