Course Overview: Computer Science

Content Area: **Template**
Course(s):
Time Period: **September**
Length:
Status: **Published**

School Mission Statement

The mission of Chartertech is to provide artists the opportunity to blend principles of artistic expression with cutting-edge technology, so artists will excel in academic, career, and civic pursuits and contribute to the harmony and productivity of the 21" century.

Artistic integration: Performing arts will be accessible to all artists as a skill and content area and will serve as a vehicle for imparting, enlivening, and motivating excellence in all academic topics, as well as providing a platform for learning multicultural appreciation and empathy, not just tolerance.

Technological integration: Technology will serve as the foundation for instructional delivery systems leading to knowledge acquisition, concept understanding, and skill mastery in all academic subjects. Technology will not be studied as a separate entity but infused into the very fabric of educational pursuits, exactly as it occurs in the business world. Artists will be prepared to compete in the modern workplace or post-secondary institution.

"Education has always been torn between vocational and utilitarian purposes on one hand and creative and holistic purposes on the other... We are rapidly entering a world that is hard to imagine. By developing the problem-solving skills, creativity, and discipline required in the arts, artists can prepare for life in the 21st century."

From Understanding How the Arts Contribute to Excellent Education

National Endowment for the Arts, 1991

School Goals

Goals for Arts Education:

Artists will learn the knowledge, skills, and abilities necessary to turn their passions and gifts in the arts into vocations or serious avocations.

Objective 1: Each year, each artist will take two semesters (10 credits) of career-oriented training (80 minutes per day) in their artistic major.
Objective 2: Each marking period, each artist will perform or produce frequently, in diverse settings and for diverse audiences.

Objective 3**:** Artistic instruction will be integrated into the study of all academic subjects.
Objective 4: Each year, each artist will complete at least twenty after-school "lab" hours in their artistic major. These will constitute career-oriented service to the school and/or community, and demonstrate accomplishment of the NJCCCS crosscutting workplace readiness standards.

Goal for Technology:
Chartertech will model the technology-intense workplace and artists will be able to compete successfully and perform well in a technology-intense workplace.

Objective 5: Each artist will routinely use technology in a workplace-like manner to acquire, analyze, communicate, and present information in every subject.
Objective 6: Each artist will have access to a computer every day, every class so that automated sources will be the main conduit for educational content.
Objective 7: All administrative and instructional functions of the school will be supported by the most modern technology available.

Goals for Academic Achievement:
Artists will apply themselves in the serious pursuit of knowledge and skills, especially skills in critical thinking, problem solving, decision making, and communication.

Objective 8: Each year, and to be promoted to the next grade each artist will pass five credits in English, Health, Social Studies, Science, Mathematics, and PE/Health. Between grades 9-12 artists will also complete 1year of Spanish.

Objective 9: In each academic subject, each year, each artist will complete a significant project that involves critical thinking, problem solving, decision making, and communication skills, and which demonstrates cross-content workplace readiness skills.

Objective 10: Each year artists will develop a artist resume to guide his/her academic and artistic studies and to document his/her academic and artistic accomplishments. This work will be done under the mentorship of the faculty in the artist's artistic major.

Objective 11: Academic instruction in all subjects will be highly cross-curricular, in accordance with curricula design and continuously improved by teachers, in compliance with the New Jersey Artist Learning Standards.

Course Description

Course Title:	Computer Science
Department:	Mathematics
Prerequisite:	None
Number of Credits:	5
Grade Level(s):	9th-12th

Standards:	Aligned to New Jersey Student Learning Standards for Computer Science and Design Thinking
Description of Course	The computer science course is designed to fulfill the New Jersey Learning Standards for Computer Science and Design Thinking.Throughout the course a cumulative approach will be taken. Connections between and new content will be frequently brought to the students' attention as we focus on comprehension and retention of Computer Science standards and skills. This course comprises nine units. The first two units of the course will be on digital information and the internet. Artists will explore how computers store complex information like numbers, text, images and sound and debate the impacts of digitizing information, learn about how the internet works, and discuss the internet impact politics, culture, and the economy. The next five units focus on programming and app design. Artists will learn about lists, loops, transversals, algorithms, parameters, return, and libraries. Artists will design their first app while learning both fundamental programming concepts and collaborative software development processes, expand the types of apps they can create by adding the ability to store information, make decisions and better organize code, build apps that use large amounts of information, pull in data from the web to create a wider variety of apps, design and analyze algorithms to understand how they work and why some are considered better than others, and learn how to design clean and reusable code that they can share with a single classmate or the entire world. Finally, the last two units are on data, cybersecurity, and global impacts. In the data unit artists will explore and visualize datasets from a wide variety of topics as they hunt for patterns and try to learn more about the world around them. In the final unit on cybersecurity and global impacts artists will research and debate current events at the intersection of data, public policy, law, ethics, and societal impact.

Overview & Pacing

Unit #	Major Content	Expected Time
Unit #1	Digital Information	4 weeks
Unit #2	The Internet	4 weeks
Unit #3	Intro to App Design	4 weeks
Unit #4	Variables, Conditionals, and Functions	4 weeks
Unit #5	Lists, Loops, and Traversals	5 weeks
Unit #6	Algorithms	3 weeks
Unit #7	Parameters, Return, and Libraries	4 weeks

Unit #8	Data	3 weeks
Unit #9	Cybersecurity and Global Impacts	4 weeks