Unit 11: Advanced Topics

Content Area: **Computer Science**
Course(s):
Time Period: **Marking Period 4**
Length: **6-8 Weeks**
Status: **Published**

Summary

This unit allows for students to go beyond the APCSA course content into computer science fields of study that interest the students. Each student, working alone or in an approved group, develop a plan to study an advanced topic (new languages, new programs, new theory, etc). The students will then work towards their goals of learning and practicing this advanced topic, and then present to the entire class (and guests if invited) about what they accomplished and how they were able to reach their goals and what roadblocks they had to overcome to get to where they are.

Revision Date: July 2021

Diversity and Inclusion: Students will focus on equity, inclusion, and tolerance when analyzing the comparison of various quantities regarding characteristics of people. Equality will also be highlighted through the topic of citizenship. This can be associated with treating people fairly and equally.

CS.9-12.8.1.12.AP.4	Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue.
CS.9-12.8.1.12.AP.6	Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.
CS.9-12.8.2.12.NT.1	Explain how different groups can contribute to the overall design of a product.
CS.9-12.8.2.12.NT.2	Redesign an existing product to improve form or function.
LA.W.11-12.6	Use technology, including the Internet, to produce, share, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
LA.11-12.CCSS.ELA-Literacy.CCRA.W.7	Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
LA.11-12.CCSS.ELA-Literacy.CCRA.W.8	Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
LA.11-12.CCSS.ELA-Literacy.WHST.11-12.9	Draw evidence from informational texts to support analysis, reflection, and research.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
CAEP.9.2.12.C.5	Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.
TECH.8.1.12.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.2.12.D.CS1	Apply the design process.
TECH.8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).

Essential Questions & Essential Understanding

- How do you prepare a presentation on progress, and potentially not a complete project?
- How do you prepare a proposal for a field of study?
- What are some pitfalls of individualized learning, and how do you overcome them?

Objectives

Students Will Know

- how to plan and build a proposal to continue their computer science learning into a field not covered in other courses.
- how to plan out learning materials to discover a new skill/field/langage in the computer science realm.

Students Will Be Skilled At

- keeping up with self established deadlines and to adjust future deadlines accordingly.
- self guided learning.

Learning Plan

Present previous project ideas to inspire new ideas.

Develop Proposal Guidelines and Structure based on student topics

Weekly check-ins to determine student progress on the deadlines.

Final presentations - invite staff/admin as appropriate.

Assessments

Assessments

- Formative: Daily assessments using examples from class notes and CodeHS.com, AP Classroom/Albert Checks for Understanding
- Summative: Teacher-created assessments/projects and CodeHS Computer Science Projects, AP Classroom/Albert Unit Assessments
- Benchmark: Check for understanding benchmark assessments on CodeHS, AP Classroom/Albert/Khan Academy Diagnostics

- Alternative Assessments: Student-centered activities such as a doorbell coding project, game design projects, and other activities involving real world applications

- Final Exam, if necessary
- Final Product and Presentation
- Preliminary Goals and Proposal

Materials

District Approved Textbook

Khan Academy

Codeacademy

CollegeBoard AP Computer Science A Website

Integrated Accomodations & Modifications

Possible accommodations/modification for AP Computer Science A