

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



Exploring Computer Science

Board Approval Date: Jan 23, 2025	Course Length: 2 Semesters
Grading: A - F	Credits: 10
Proposed Grade Level(s): 9th - 12th	Subject Area: CTE Elective Area (if applicable):
Prerequisite(s): None	Corequisite(s):
CTE Sector/Pathway: Information and Communication Technologies	
Intent to Pursue 'A-G' College Prep Status: Yes	
A-G Course Identifier: (g) Elective	
Graduation Requirement: No	
Course Intent: Online District Course Program (if applicable): CTE	
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COURSE DESCRIPTION:

Exploring Computer Science focuses on the creative, collaborative, interdisciplinary, and problem-solving nature of computing featuring an inquiry-based approach to learning and teaching. As part of this curriculum, students will delve into real world computing problems that are culturally relevant and address social and ethical issues while delivering foundational computer science knowledge to students. Students will engage in several in-depth projects to demonstrate the real-world application of computing.

DETAILED UNITS OF INSTRUCTION:

Unit Number/Title	Unit Essential Questions	Examples of Formative Assessments	Examples of Summative Assessment
1. Encryption	What is encryption, and why is it necessary for secure communication? How does encryption work to protect data, and what are the main types of encryption (e.g., symmetric vs. asymmetric)? What are some real-world applications of encryption, and how does it impact our daily lives?	● Online or paper-based worksheets and practice sets ● Quizzes ● Threaded discussions	● Exams (unit, semester and final) ● Programming Projects ● Presentations
Unit 1 Essential Standards: 9-12.NI.7 Compare and contrast cryptographic techniques to model the secure transmission of information. 9-12S.NI.6 Analyze cryptographic techniques to model the secure transmission of information.			
2. Image Manipulation	How can digital images be altered, and what are the primary tools and techniques used? What ethical considerations come into play with image manipulation? How do various image formats and resolutions affect image quality and use cases?	● Online or paper-based worksheets and practice sets ● Quizzes ● Threaded discussion	● Exams (unit, semester and final) ● Programming Projects ● Presentations
Unit 2 Essential Standards: 9-12.AP.17 Create computational artifacts using modular design. 9-12.AP.12 Design algorithms to solve computational problems using a combination of original and existing algorithms.			
3. The Internet	What is the Internet, and how did it evolve into the system we use today? How does data travel across the Internet?	● Online or paper-based worksheets and practice sets ● Quizzes	● Exams (unit, semester and final) ● Programming Projects

	What roles do IP addresses and domain names play in Internet communication? How is information secured on the Internet?	• Threaded discussions	• Presentations
Unit 3 Essential Standards: 9-12.NI.5 Describe the design characteristics of the internet.			
4. Cybersecurity	How does cybersecurity impact individuals, businesses, and governments? What types of cyber attacks exist (e.g., phishing, malware, ransomware)? What role does encryption play in cybersecurity? How can we balance privacy and security in a digital society?	• Online or paper-based worksheets and practice sets • Quizzes • Threaded discussions	• Exams (unit, semester and final) • Programming Projects • Presentations
Unit 4 Essential Standards: 9-12S.NI.5 Develop solutions to security threats.			
5. Cyber Ethics	What are the ethical responsibilities of individuals and companies in protecting digital privacy? How can personal information be used and misused online, and what protections should individuals have? What constitutes fair and responsible use of digital information and technology? How can digital media contribute to misinformation, and what responsibilities do technology creators have in addressing it?	• Online or paper-based worksheets and practice sets • Quizzes • Threaded discussions	• Exams (unit, semester and final) • Programming Projects • Presentations
Unit 5 Essential Standards: 9-12.IC.23 Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.			
6. Working with Data	How can we collect, clean, and organize data effectively? How do we choose the right data visualization for a dataset? How can data analysis and visualization tell a story or reveal trends? What ethical considerations must we take into account when working with data?	• Online or paper-based worksheets and practice sets • Quizzes • Threaded discussions	• Exams (unit, semester and final) • Programming Projects • Presentations

Unit 6 Essential Standards: 9-12S.DA.8 Use data analysis tools and techniques to identify patterns in data representing complex systems.			
7. Simulations	What is a simulation, and how does it differ from a real-world experiment? How can simulations help us make predictions and understand complex systems? What are the key components and structures of a computer simulation? What ethical considerations come into play when designing or using simulations?	• Online or paper-based worksheets and practice sets • Quizzes • Threaded discussions	• Exams (unit, semester and final) • Programming Projects • Presentations
Unit 7 Essential Standards: D2.0 Demonstrate an understanding of game and simulation analysis, design, standard documentation, and development tools.			
8. Project using Data	What Techniques Can We Use to Interpret Data? How Do We Protect Privacy and Handle Data Ethically? How Can We Turn Data Insights into Action?	• Online or paper-based worksheets and practice sets • Quizzes • Threaded discussions	• Exams (unit, semester and final) • Programming Projects • Presentations
Unit 8 Essential Standards: 9-12.AP.16 Decompose problems into smaller subproblems through systematic analysis, using constructs such as procedures, modules, and/or classes. 9-12.DA.10 Create data visualizations to help others better understand real-world phenomena.			

RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:

Link to Common Core Standards (if applicable):

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

- **CCSS.ELA-Literacy.CCRA.R.1** Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
- **CCSS.ELA-Literacy.CCRA.R.2** Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
- **CCSS.ELA-Literacy.CCRA.W.4** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- **CCSS.ELA-Literacy.CCRA.W.6** Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
- **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.

- **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.
- **CCSS.ELA-Literacy.CCRA.W.10** Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.
- **CCSS.ELA-Literacy.CCRA.SL.1** Prepare for and participate effectively in a range of conversations • and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
- **CCSS.ELA-Literacy.CCRA.SL.2** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- **CCSS.ELA-Literacy.CCRA.SL.3** Evaluate a [speaker's] point of view, reasoning, and use of evidence and rhetoric.
- **CCSS.ELA-Literacy.CCRA.SL.4** Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
- **CCSS.ELA-Literacy.CCRA.SL.5** Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
- **CCSS.ELA-Literacy.CCRA.L.6** Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.
- **CCSS.Math.Practice.MP1** Make sense of problems and persevere in solving them.
- **CCSS.Math.Practice.MP2** Reason abstractly and quantitatively.
- **CCSS.Math.Practice.MP3** Construct viable arguments and critique the reasoning of others.
- **CCSS.Math.Practice.MP4** Model with Mathematics.
- **CCSS.Math.Practice.MP5** Use appropriate tools strategically.
- **CCSS.Math.Content.HSF-BF.A.1a** Building Functions - Write a function that describes a relationship between two quantities: Determine an explicit expression, a recursive process, or steps for calculation from a context.
- **CCSS.Math.Content.HSS-ID.A.13** Interpreting Categorical and Quantitative Data - Summarize, represent, and interpret data on a single count or measurement variable: Represent data with plots on the real number line (dot plots, histograms, and box plots).
- **CCSS.Math.Content.HSS-ID.A.3** Interpreting Categorical and Quantitative Data - Summarize, represent, and interpret data on a single count or measurement variable: Interpret differences in shape, center, and spread in the context of data sets, accounting for possible effects of extreme data points (outliers).
- **CCSS.Math.Content.HSS-CP.A.1** Conditional Probability and the Rules of Probability - Understand independence and conditional probability and use them to interpret data: Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or" and "not").
- **CCSS.Math.Content.HSS-IC.B.4** Making inferences and Justifying Conclusions - Make inferences and justify conclusions from sample surveys, experiments, and observational studies: Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.
- **CCSS.Math.Content.HSA-CED.A.3** Creating Equations - Create Equations that describe numbers or relationships: Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

Link to Framework (if applicable):

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

[CTE Framework Link](#)

Link to Subject Area Content Standards (if applicable):

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

[CTE Content Standards Link](#)

Link to Program Content Area Standards (if applicable):

Program Content Area Standards apply to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

[CTE Model Curriculum Standards Link](#)

TEXTBOOKS AND RESOURCE MATERIALS:

Textbooks

Board Approved	Pilot Completion Date (If applicable)	Textbook Title	Author(s)	Publisher	Edition	Date
<i>Yes</i>		<i>Exploring Computer Science</i>	K12 Stride	K12 Stride		<i>May 2023</i>