

COMPUTER SCIENCE I PERFORMANCE STANDARDS

Business education – course code 034400

The curriculum used must incorporate the following standards to qualify as Computer Science I credit.

COMPUTER SCIENCE I PERFORMANCE STANDARDS

Concept	Subconcept	Standard	
Computing Systems	Devices	9-10.CS.D.01	Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects.
	Hardware & Software	9-10.CS.HS.01	Explain the abstraction and interactions between application software, system software and hardware.
	Troubleshooting	9-10.CS.T.01	Develop, communicate and apply systematic troubleshooting strategies for correction of errors in computing systems.
Networks and the Internet	Network Communication & Organization	9-10.NI.NCO.01	Evaluate the scalability and reliability of networks by identifying and illustrating the basic components of computer networks (e.g., routers, switches, servers) and network protocols (e.g., IP, DNS).
		9-10.NI.NCO.02	Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topology).
	Cybersecurity	9-10.NI.C.01	Compare physical and cybersecurity measures by evaluating trade-offs between the usability and security of a computing system.
		9-10.NI.C.02	Illustrate how sensitive data can be affected by attacks.
		9-10.NI.C.03	Recommend security measures to address various scenarios based on information security principles.
		9-10.NI.C.04	Explain trade-offs when selecting and implementing cybersecurity recommendations from multiple perspectives such as the user, enterprise and government.
Data Analysis	Storage	9-10.DA.S.01	Translate and compare different bit representations of data types, such as characters, numbers and images.
		9-10.DA.S.02	Evaluate the trade-offs in how data is organized and stored digitally.
	Collection, Visualization & Transformation	9-10.DA.CVT.01	Create data visualizations to help others better understand real-world phenomena.
		9-10.DA.CVT.02	Explain the insights and knowledge gained from digitally processed data by using appropriate visualizations, notions and precise language.
		9-10.DA.CVT.03	Evaluate and refine computational artifacts to make them more usable and accessible.
	Inference & Models	9-10.DA.IM.01	Show the relationships between collected data elements using computational models.
9-10.DA.IM.02		Refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.	
Algorithms & Programming	Algorithms	9-10.AP.A.01	Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem.
	Variables	9-10.AP.V.01	Create problem solutions that utilize primitive variables (e.g., strings, ints, Booleans, doubles).
		9-10.AP.V.02	Demonstrate the use of advanced variables (e.g., lists, arrays, objects) to simplify solutions, generalizing computational problems instead of repeatedly using primitive variables.
	Control	9-10.AP.C.01	Apply the concepts of specific control structures (e.g., sequence, conditionals, repetition, procedures) considering program efficiencies such as readability, performance and memory usage.
Modularity	9-10.AP.M.01	Break down a solution into procedures using systematic analysis and design utilizing functional abstraction.	

Concept	Subconcept	Standard	
Algorithms & Programming	Program Development	9-10.AP.M.02	Create computational artifacts (file, graphic, video, audio) by systematically organizing, manipulating and/or processing data.
		9-10.AP.PD.01	Using visual aids and documentation, illustrate the design elements and data flow (e.g., flowcharts, pseudocode) of the development of a program.
		9-10.AP.PD.02	Create a program by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, debugging errors and adapting the program for a variety of users.
		9-10.AP.PD.04	While collaborating in a team, develop, test and refine programs that solve practical problems or allow self-expression.
		9-10.AP.PD.05	Evaluate and refine computational artifacts to make them more user-friendly, efficient and/or accessible.
Impacts of Computing	Culture	9-10.IC.C.01	Evaluate the ways computing impacts personal, ethical, social, economic and cultural practices.
		9-10.IC.C.02	Test and refine computational artifacts to reduce bias and equity deficits.
		9-10.IC.C.03	Demonstrate how a given algorithm applies to problems across disciplines.
	Social Interactions	9-10.IC.SI.01	Demonstrate through collaboration on a project how computing increases connectivity among people of various cultures.
		9-10.IC.SI.02	Explain how the degrees of communication afforded by computing have impacted the nature and content of career fields.
	Safety, Laws & Ethics	9-10.IC.SLE.01	Explain the beneficial and harmful effects that intellectual property laws can have on innovation.
		9-10.IC.SLE.02	Explain the privacy concerns related to the collection and analysis of information about individuals that may not be evident to users.
		9-10.IC.SLE.03	Evaluate the social and economic consequences of how law and ethics interact with digital aspects of privacy, data, property, information and identity.
		9-10.AP.SLE.04	Define and classify a variety of software licensing schemes (e.g., open source, freeware, commercial) and discuss the advantages and disadvantages of each scheme in software development.
		9-10.IC.SLE.05	Identify and explain the potential impacts and implications of emerging technologies on larger social economic and political structures with evidence from credible sources.

References:

Computer Science Teachers Association (2017). *CSTA K-12 Computer Science Standards, Revised 2017*. Retrieved from <http://www.csteachers.org/standards>