CompuScholar, Inc.

Alignment to Arkansas **Computer Science With Programming /Coding Emphasis** Standards

Arkansas Course Details:

Course Title:	Computer Science with Programming / Coding Emphasis
Course Code(s):	465010 / 465020 (Level 1 / Level 2)
Grade Level:	9th - 12th Grade
Standards Link:	HS_Computer_Science_042018.pdf
Standards Coverage:	100%

CompuScholar Course Details:

Course Title:	Java Programming (Abridged)
Course ISBN:	978-0-9887070-4-7
Course Year:	2019

Note 1: Citation(s) listed may represent a subset of the instances where objectives are met throughout the course. Level 3 and Level 4 requirements may be additionally met, though not explicitly cited.

Note 2: Citation(s) for a "Lesson" refer to the "Lesson Text" elements and associated "Activities" within the course, unless otherwise noted. The "Instructional Video" components are supplements designed to introduce or re-enforce the main lesson concepts, and the Lesson Text contains full details.

Course Description

The Arkansas Computer Science Standards for High School are designed to provide foundational understandings of concepts in computer science that are necessary for students to function in an ever-changing technological world. Through these standards, students will explore, apply, and move toward mastery in skills and concepts related to Computational Thinking and Problem Solving; Data and Information; Algorithms and Programs; Computers and Communications; and Community, Global, and Ethical Impacts. These standards help students learn to accomplish tasks and solve problems independently and collaboratively. These standards give students the tools and skills needed to be successful in college and careers, whether in computer science or in other fields.

Course Standards

Strand: Computational Thinking and Problem Solving		CITATION(S)
Content Cluster 1: Students will analyze problem-solving strategies.		
Level 1	Level 2	
CSL1.1.1 Leverage problem-solving strategies to solve problems of level-appropriate complexity	CSL2.1.1 Leverage problem-solving strategies to solve problems of level-appropriate complexity	Chapter 9 and throughout the course

CSL1.1.2 Compare and contrast multiple representations of problem-solving logic	CSL2.1.2 Analyze multiple representations of problem-solving logic	Chapter 19
CSL1.1.3 Analyze and implement collaborative methods in problem solving of level-appropriate complexity	CSL2.1.3 Analyze and implement collaborative methods in problem solving of level-appropriate complexity	Chapter 21 Supplemental Chapter 2, Lesson 1
CSL1.1.4 Recognize processes and techniques for troubleshooting of level-appropriate complexity	CSL2.1.4 Recognize processes and techniques for troubleshooting of level-appropriate complexity	Chapter 9
CSL1.1.5 Decompose a problem of level-appropriate complexity into more simple, solvable parts	CSL2.1.5 Decompose a problem of level-appropriate complexity into more simple, solvable parts	Chapter 8 Chapter 17, Lesson 4

Strand: Computational Thinking and Problem Solving **Content Cluster 2: Students will analyze connections between elements of mathematics and computer science.**		**CITATION(S)**
Level 1	**Level 2**	
CSL1.2.1 Interpret logical expressions using Boolean operators (e.g., AND, NOT, OR, XOR)	CSL2.2.1 Interpret logical expressions using short-circuit evaluation	Chapter 7, Lesson 1 Chapter 7, Lesson 2
CSL1.2.2 Classify the types of information that can be stored as variables (e.g., Booleans, characters, integers, floating points, strings)	CSL2.2.2 *Continuation of this standard is not specifically included or excluded*	Chapter 4 Chapter 5
CSL1.2.3 Identify mathematical concepts (e.g., random number generation, vocabulary) related to computer science	CSL2.2.3 Recognize the similarities and differences between mathematics and computer science algorithms	Chapter 17
CSL1.2.4 *This standard is not specifically required until Level 2*	CSL2.2.4 Discuss the concept of abstraction	Chapters 10, 11, 15
CSL1.2.5 *This standard is not specifically required until Level 2*	CSL2.2.5 Perform simple operations with $base_{10}$, $base_2$, and $base_{16}$ numbers	Chapter 17, Lesson 2

CSL1.2.6 Demonstrate operator (e.g., +, -, /, %, concatenation) precedence in expressions and statements	CSL2.2.6 Demonstrate operator (e.g., math, pow, sqrt) precedence in expressions and statements	Chapter 7, Lesson 1 Chapter 17, Lesson 1

Strand: Data and Information		**CITATION(S)**
Content Cluster 3: Students will store and manipulate data through the use of computing devices.		
Level 1	**Level 2**	
CSL1.3.1 Define, store, and manipulate primitive data	CSL2.3.1 Define, store, and manipulate linear data	Chapter 4 Chapter 14
CSL1.3.2 Compare and contrast level-appropriate numeric and non-numeric data representations	CSL2.3.2 Compare and contrast level-appropriate numeric and non-numeric data representations	Chapter 4 Chapter 5

Strand: Data and Information		**CITATION(S)**
Content Cluster 4: Students will analyze and interpret data through the use of computing devices.		
Level 1	**Level 2**	
CSL1.4.1 *This standard is not specifically required until Level 2*	CSL2.4.1 Analyze the degree to which a computer model accurately represents an actual situation (e.g., Conway's Game of Life, population growth, predator-prey)	Supplemental Chapter 1, Lesson 5
CSL1.4.2 Examine the ability of computing technology to create and process Big Data	CSL2.4.2 Determine an appropriate visual representation for given data	N/A (1.4.2) Chapter 10, Lesson 2 Chapter 14 Supplemental Chapter 2, Lesson 1
CSL1.4.3 *This standard is not specifically required until Level 2*	CSL2.4.3 Implement algorithms to perform data analysis (e.g., longest string, maximum, mean, minimum, range)	Chapter 17, Lesson 4 Chapter 19

Strand: Algorithms and Programs		CITATION(S)
Content Cluster 5: Students will create, evaluate, and modify algorithms.		
Level 1	**Level 2**	
CSL1.5.1 Construct and evaluate simple expressions using relational and logical operators	CSL2.5.1 Construct and evaluate compound expressions using relational and logical operators	Chapter 7
CSL1.5.2 Design and implement algorithms that use sequence and selection including nested ifs (e.g., if, if/else, if/else if, switch-case)	CSL2.5.2 Design and implement algorithms that use sequence, selection, and iteration including nested loops (e.g., for, for each, while, do while)	Chapter 7
CSL1.5.3 Illustrate the flow of execution of a program including branching and looping	CSL2.5.3 Illustrate the flow of execution of an increasingly complex program including branching and looping	Chapter 7 Chapter 17, Lesson 4 Chapter 19
CSL1.5.4 Evaluate the qualities of level-appropriate algorithms	CSL2.5.4 Evaluate the qualities of level-appropriate algorithms	Chapter 17, Lesson 4 Chapter 19
CSL1.5.5 Utilize a systematic approach to detect structural and logic errors	CSL2.5.5 Utilize a systematic approach to detect structural and logic errors	Chapter 9

Strand: Algorithms and Programs		CITATION(S)
Content Cluster 6: Students will create programs to solve problems.		
Level 1	**Level 2**	
CSL1.6.1 Create programs to solve problems of level-appropriate complexity applying best practices of program design and format (e.g., descriptive names, documentation, indentation, whitespace)	CSL2.6.1 Create programs to solve problems of level-appropriate complexity applying best practices of program design and format (e.g., descriptive names, documentation, indentation, whitespace)	Chapter 2, Lesson 2 and throughout the course
CSL1.6.2 Utilize functions/methods/procedures to input, output, and manipulate data with and without parameters	CSL2.6.2 Determine the scope of variables declared in functions/methods/procedures and control structures	Chapter 10, Lesson 2

CSL1.6.3 Create a program that reads from standard input and writes to standard output	CSL2.6.3 Create a program that reads from a file and writes to a file	Chapter 18
CSL1.6.4 *This standard is not specifically required until Level 4*	CSL2.6.4 *This standard is not specifically required until Level 4*	Chapter 21 Supplemental Chapter 2, Lesson 1

Strand: Computers and Communications		CITATION(S)
Content Cluster 7: Students will analyze the utilization of computers.		
Level 1	**Level 2**	
CSL1.7.1 *This standard is not specifically required until Level 2*	CSL2.7.1 Characterize how software and/or hardware is used in industry (e.g., business, government, medical, military, sports)	Chapter 1
CSL1.7.2 Identify desired technical and soft skills (e.g., collaboration, communication, problem solving, teamwork) that can be enhanced by computer science	CSL2.7.2 Discuss technical and soft skills honed by computer science	Supplemental Chapter 2, Lesson 2
CSL1.7.3 Discuss diverse careers that are influenced by computer science and its availability to all regardless of background	CSL2.7.3 Analyze a historical timeline of computers and technology	Chapter 1

Strand: Computers and Communications		CITATION(S)
Content Cluster 8: Students will analyze resilient, reliable, and adaptable communication methods and systems used to transmit information among computing devices.		
Level 1	**Level 2**	
CSL1.8.1 Utilize networks to perform level-appropriate tasks	CSL2.8.1 Utilize networks to perform level-appropriate tasks	Students use online infrastructure throughout the course and have multiple opportunities for online research and data-gathering (see supplemental projects and lessons)

CSL1.8.2 Discuss the role of internet service providers (ISP) in providing connectivity	CSL2.8.2 Discuss the hierarchical nature of networks, subnetworks, and the Internet	Supplemental Chapter 1, Lesson 2
CSL1.8.3 Compare and contrast local area networks (LAN) and wide area networks (WAN)	CSL2.8.3 Identify various common topologies utilized in network implementations	Supplemental Chapter 1, Lesson 2
CSL1.8.4 *This standard is not specifically required until Level 2*	CSL2.8.4 Identify digital and physical methods used to secure networks	Chapter 1, Lesson 5
CSL1.8.5 Identify common network protocols (e.g., DNS, HTTP/HTTPS, SMTP/POP/IMAP, Telnet/SSH)	CSL2.8.5 Compare and contrast common network protocols (e.g., DNS, HTTP/HTTPS, SMTP/POP/IMAP, Telnet/SSH)	Supplemental Chapter 1, Lesson 4

Strand: Computers and Communications		CITATION(S)
Content Cluster 9: Students will utilize appropriate hardware and software.		
Level 1	**Level 2**	
CSL1.9.1 Compare and contrast computer programming paradigms and languages (e.g., text-based, visual, high-level, low-level, object-oriented)	CSL2.9.1 Compare and contrast the tradeoffs between compiled and interpreted languages	Chapter 1, Lesson 3
CSL1.9.2 Discuss version control and Integrated Development Environments (IDE)	CSL2.9.2 Use the debugger in an IDE	Chapter 3 Chapter 9
CSL1.9.3 Classify layers of software (e.g., applications, drivers, operating systems) within various platforms	CSL2.9.3 *Continuation of this standard is not specifically included or excluded*	Chapter 1, Lesson 2
CSL1.9.4 Identify hardware components (e.g., input/output devices, internal organization of a computer, storage devices) of computing technology within various platforms	CSL2.9.4 *Continuation of this standard is not specifically included or excluded*	Chapter 1, Lesson 1

Strand: Community, Global, and Ethical Impacts		CITATION(S)
Content Cluster 10: Students will analyze appropriate uses of technology and its social and global impacts		
Level 1	**Level 2**	
CSL1.10.1 Categorize the risks associated with the utilization and implementation of digital technology (Legal, Physical, Psychological, Social)	CSL2.10.1 Discuss the effects associated with the use of social media (e.g., global communication, hiring, incarceration, termination)	Chapter 1, Lesson 4 Chapter 1, Lesson 5
CSL1.10.2 Discuss issues related to personal security	CSL2.10.2 Identify components of a digital footprint (e.g., active and passive data) and the lasting impact	Chapter 1, Lesson 5
CSL1.10.3 *This standard is not specifically required until Level 3*	CSL2.10.3 *Continuation of this standard is not specifically included or excluded*	Supplemental Chapter 3 Lessons 1 - 3