CompuScholar, Inc.

Alignment to Arkansas **Mobile Application Development** Standards

Course Title: **CompuScholar: Android Programming**
Course ISBN: **978-0-9887070-5-4**

Note 1: Arkansas standards were derived from this document: http://www.arkansased.gov/public/userfiles/Learning_Services/Curriculum%20and%20Instruction/Frameworks/Computer%20Science/HS_Computer_Science_082016.pdf

Note 2: Citation(s) listed may represent a subset of the actual instances where objectives are met throughout the course.

Arkansas Computer Science Standards	
Course Title:	**Mobile Application Development**
Course/Unit Credit:	1
Course Number:	465310 / 465320 (Level 1 / Level 2)
Grades:	9 - 12

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. This document contains the exceptions and ammendments for **Mobile Application Development**.

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 8 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 9, Lesson 2

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	Chapters 7, 8, 14
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 8
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 7 Chapter 9

Strand: Computational Thinking and Problem Solving		**CITATION(S)**
Content Cluster 2: Students will analyze connections between elements of mathematics and computer science.		
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 6, Lesson 1 Chapter 6, 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 3 Chapter 4
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 3, Lesson 2 N/A (2.2.3)
CSL1.2.4 *This standard is not specifically required until Level 2*	CSL2.2.4 Discuss the concept of abstraction	Chapters 9, 10, 14
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	N/A (available in other CompuScholar courses)
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 6, 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 3 Chapter 13
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 3 Chapter 4

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)	N/A (available in other CompuScholar courses)
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 9, Lesson 2 Chapter 13
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)	N/A (available in other CompuScholar courses)

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 6

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). To meet this standard both drag and drop and text-based programming paradigms should be used.	Chapter 6
CSL1.5.3 Illustrate the flow of execution of a program including branching and looping. To meet this standard a visual programming environment should be used.	CSL2.5.3 Illustrate the flow of execution of an increasingly complex program including branching and looping	Chapter 6 Chapter 19
CSL1.5.4 Evaluate the qualities of level-appropriate algorithms	CSL2.5.4 Evaluate the qualities of level-appropriate algorithms	N/A (available in other CompuScholar courses)
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 8

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). To meet this standard multiple applications for Android or iOS should be developed.	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). To meet this standard, applications should be development for a different platform than was used in Level 1 (e.g., iOS vs. Android) or at least two platforms if MAD Level 1 was not taken.	Chapter 1, Lesson 2 and throughout the first half using text editor, Eclipse, JDK. Multiple Android Apps developed in the second half using ADT and emulator.

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 9, 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 22

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)	N/A (available in other CompuScholar courses)
CSL1.7.2 Identify desired technical and soft skills (e.g., collaboration, communication, problem solving, teamwork) that can be enhanced by computer science. To meet this standard, skills for employment and various roles (e.g., developer, graphic designer, project manager, team leader, quaility assurance) required by app development companies should be identified.	CSL2.7.2 Discuss technical and soft skills honed by computer science	N/A (available in other CompuScholar courses)
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	N/A (available in other CompuScholar courses)

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
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	N/A (available in other CompuScholar courses)
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	N/A (available in other CompuScholar courses)
CSL1.8.4 *This standard is not specifically required until Level 2*	CSL2.8.4 Identify digital and physical methods used to secure networks	N/A (available in other CompuScholar courses)
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)	Chapter 27

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	N/A (available in other CompuScholar courses)

CSL1.9.2 Discuss version control and Integrated Development Environments (IDE). To meet this standard an introductory discussion must include: • A basic visual programming environment (e.g, Scratch, Alice), • Android based visual and drag-and-drop programming environment (e.g., App Inventor), and • IOS based visual and drag-and-drop programming environment (e.g., App Lab, Game Salad).	CSL2.9.2 Use the debugger in an IDE. To meet this standard a text-based IDE must be used (e.g., Eclipse, xCode).	Chapter 2 Chapter 8 Chapter 20, Lesson 2
CSL1.9.3 Classify layers of software (e.g., applications, drivers, operating systems) within various platforms. To meet this standard top apps/genres must be compared.	CSL2.9.3 *Continuation of this standard is not specifically included or excluded*	N/A (available in other CompuScholar courses)
CSL1.9.4 Identify hardware components (e.g., input/output devices, internal organization of a computer, storage devices) of computing technology within various platforms. To meet this standard Android or IOS devices and their components (e.g., sensors, input/output, interface elements) must be included.	CSL2.9.4 *Continuation of this standard is not specifically included or excluded*	N/A (available in other CompuScholar courses)

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)	N/A (available in other CompuScholar courses)

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	N/A (available in other CompuScholar courses)

Strand: Mobile Application Development Addendum		CITATION(S)
Level 1	Level 2	
CSL1.11.1 (addition) Explore the Apple or Android developer website and determine steps to become a developer.	N/A	Chapter 16, Lesson 1