

CompuScholar, Inc.

Alignment to the Mississippi 2023 Software Development Standards

Python I (902110)

Mississippi Standards Information:

State Page	Mississippi Curriculum Standards
Standards Link:	2023 Software Development Standards (docx)
Course Code	902110

CompuScholar Course Details:

Course Title:	Computer Science Foundations
Course ISBN:	978-1-946113-02-3
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Course Description

CompuScholar's **Computer Science Foundations** curriculum is commonly used for Computer Science I courses in many states. It is also endorsed by the College Board as fully aligned with AP CS Principles. The course uses Python to teach introductory coding concepts, decision-making, iteration, data management, algorithms, functions, impacts of computing, digital citizenship, cybersecurity, and other classic CS topics.

Python I (Units 16 - 19)

Note 1: Citation(s) for a "Lesson" refer to the "**Lesson Text**" page where instruction of concepts is found. Additional hands-on practice can be found in the nearby "**Chapter Activity**" pages within that chapter.

Note 2: The "Instructional Video" components are optional supplements designed to introduce or reinforce the main lesson concepts and are not cited as standards-bearing content.

Note 3: Citation(s) to "Supplemental" or "Suppl." Chapters refer to Supplemental Chapters found at the end of the course.

Unit 16: Fundamentals of Python	CITATIONS
1. Describe proper programming techniques.	
a. Discuss Python terminology.	Chapter 3, Lessons 2, 3 and throughout the course
b. Explore the syntax, logic, and structure of Python programs.	Chapter 3, Lessons 2, 3 Chapter 4 (Data), Chapter 5 (I/O), Chapter 6 (Logic), Chapter 8 (Loops), Chapter 12 (Functions)

c. Discuss readability through proper use of whitespace, indentation, and comments.	Chapter 3, Lesson 3 Chapter 6, Lesson 2 Chapter 8, Lesson 1, etc.
d. Develop algorithms using pseudocode.	Chapter 15, Lesson 2
2. Use variables and data types.	
a. Declare variables and determine data types.	Chapter 4, Lessons 1, 2
b. Create expressions while following the proper order of operations.	Chapter 4, Lesson 3 Chapter 6 (All lessons)
3. Construct input and output statements.	
a. Manipulate strings.	Chapter 4, Lesson 4 Chapter 5, Lesson 3
b. Format strings using f-strings.	N/A
c. Add proper comments for documentation.	Chapter 3, Lesson 3 Chapter 14, Lesson 3 Chapter 15, Lesson 2
d. Process user input and output.	Chapter 5, Lessons 1, 2 and throughout the course
e. Debug using Python.	Chapter 7 (All lessons)
4. Apply control structures and statements to control program flow.	
a. Apply decision statements using conditionals.	Chapter 6 (All lessons)
b. Apply repetition statements using loops.	Chapter 8 (All lessons)
5. Design programs using functions.	
a. Use function calls and built-in functions.	Throughout the course, e.g.: Chapter 9, Lesson 2 Chapter 10, Lessons 1, 2, 3 Chapter 11, Lesson 2
b. Define functions using parameters.	Chapter 12, Lessons 1, 2
c. Call functions using arguments.	Chapter 12, Lesson 2
d. Analyze, detect, and fix code segments that have errors.	Chapter 7 (All lessons)
e. Analyze and construct code segments that handle exemptions (sic - presumed exceptions).	Chapter 7, Lesson 1 Chapter 11, Lesson 3 Supplemental Chapter 2, Lesson 3

Unit 17: Data Handling	CITATIONS
1. Apply concepts to process data.	
a. Open, read, search, and write to files.	Supplemental Chapter 2, Lesson 1
2. Analyze data collections.	
a. Construct lists, tuples, and strings.	Chapter 4, Lesson 3 (Strings) Chapter 5, Lessons 1, 3 (Stings) Chapter 9, Lessons 1, 2 (Lists, Tuples)
b. Manipulate mutable data collections.	Chapter 9, Lessons 2, 3
c. Discuss dictionaries and sets.	N/A

Unit 18: Object-Oriented Programming	CITATIONS
1. Identify object-oriented programming.	
a. Discuss programs with classes.	N/A
b. Discuss inheritance and recursion.	N/A

Unit 19: Capstone – Python I	CITATIONS
1. Using software tools and programming skills learned in this course, apply the software development life cycle (SDLC) process to solve a student-selected, instructor approved, industry and community relevant problem (Individual, small group, or large group).	
a. Research a problem that must be approved by the instructor before beginning the project.	Chapter 14, Activity 1
b. Use the SDLC process including pseudocode and wireframes to plan, design, develop, test, and implement the project.	Chapter 14, Lessons 2, 3, 4 Chapter 14, Activities 1, 2, 3
c. Utilize graphs, charts, and tables to analyze and display the data.	Chapter 17, Lessons 1, 3
d. Follow technical writing guides to convey project data and results.	Chapter 14, Lessons 3, 4 Chapter 14, Activities 1, 3
e. Develop the project in a way that can be easily shared with others so they can retrace steps and build on successes.	Chapter 14, Lessons 3, 4 Chapter 14, Activities 1, 3
f. Demonstrate effective interpersonal communication skills in a team or professional setting.	Chapter 14, Lesson 1 Chapter 14, Activities 1, 2, 3 Chapter 29, Lesson 2

g. Explore different development models such as agile, waterfall, spiral, etc. and choose one for the project.	Chapter 14, Lesson 2
2. Implement Planning and Design Phase of the SDLC.	
a. Gather project requirements and define the scope of the project.	Chapter 14, Lesson 3 Chapter 14, Activity 1
b. Using appropriate tools and materials, create a wireframe or prototype while considering the project requirements (e.g., accessibility, reliability, aesthetics, and the user experience).	Chapter 14, Lesson 3 Chapter 14, Activity 1
c. Create pseudocode to outline the project.	Chapter 14, Lesson 3 Chapter 14, Activity 1 Chapter 15, Lesson 2
d. Identify tasks and a timeline to complete the project.	Chapter 14, Lesson 2 Chapter 14, Activity 1
e. Create a project management schedule to track progress and ensure completion.	Chapter 14, Lesson 2 Chapter 14, Activity 1
f. Discuss and utilize various project management tools (e.g., virtual meetings, shared documents, Gantt chart, software applications, etc.).	Chapter 14, Lessons 1, 3, 4
g. Plan for and conduct mid-project check-ins.	Chapter 14, Lesson 2 Chapter 14, Activities 1, 2, 3
3. Implement Development Phase of SDLC.	
a. Build a layout and implement functionality.	Chapter 14, Activity 2
b. Utilize peer code reviews.	Chapter 7, Lesson 2 Chapter 14, Activities 2, 3
4. Implement Test Phases of SDLC.	
a. Simulate process of user acceptance testing and quality assurance testing.	Chapter 14, Lesson 4 Chapter 14, Activity 3
5. Present and justify a final product to an authentic audience.	
a. Produce professional quality technical documents satisfying criteria listed in the assignment.	Chapter 14, Lesson 3 Chapter 14, Activity 1
b. Using appropriate technology and professional manner, present project elements to an authentic audience.	Chapter 14, Activities 1, 2, 3 (Output from all stages may be presented to the class)
c. Collect the following work materials in a portfolio to demonstrate proper use of the design process.	See below - All project elements may be added to a portfolio
• Project requirements	Chapter 14, Lesson 3 Chapter 14, Activity 1
• Wire frames	Chapter 14, Lesson 3 Chapter 14, Activity 1
• Pseudocode	Chapter 14, Lesson 3 Chapter 14, Activity 1

• Product specifications and analysis	Chapter 14, Lesson 3 Chapter 14, Activity 1
• Testing methodologies and results	Chapter 14, Lesson 4 Chapter 14, Activity 3
• Technical writing samples	Chapter 14, Lesson 3 Chapter 14, Activity 1