

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