

## CompuScholar, Inc.

### Alignment to Georgia Computer Science Principles Standards

#### Georgia Course Details:

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| <b>Course Title:</b>   | Computer Science Principles                     |
| <b>Career Cluster:</b> | CTAE / Information Technology                   |
| <b>Course Code(s):</b> | 11.47100  |
| <b>Standards Link:</b> | <a href="#">Computer Science Principles.pdf</a> |

#### CompuScholar Course Details:

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| <b>Course Title:</b> | Computer Science Foundations |
| <b>Course ISBN:</b>  | 978-1-946113-02-3            |
| <b>Course Year:</b>  | 2022                         |

**Note 1:** Citation(s) listed may represent a subset of the instances where objectives are met throughout the course.

**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.

**Note 3:** Citation(s) to "Supplemental" or "Suppl." lessons can be found in Supplemental chapters at the end of each course.

### Georgia Course Description

How can computing change the world? What is computer science? Engage your creativity. Demonstrate and build your problem-solving ability all while connecting the relevance of computer science to society! Computer Science (CS) Principles is an intellectually rich and engaging course that is focused on building a solid understanding and foundation in computer science. This course emphasizes the content, practices, thinking and skills central to the discipline of computer science. Through both its content and pedagogy, this course aims to appeal to a broad audience. The focus of this course will fall into these computational thinking practices: connecting computing, developing computational artifacts, abstracting, analyzing problems and artifacts, communicating, and collaborating.

### Course Standards

| <b>IT-CSP-1: Standard: Demonstrate employability skills required by business and industry.</b>  | <b>CITATION(S)</b>    |
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| IT-CSP-1 standards are identical across all CTAE courses and are intended to be incorporated by the teacher into other lessons as opportunities arise. All CompuScholar courses contain opportunities for effective communication, research, problem- solving, creative thought, career exploration, workspace traits, time management, and teamwork. | Throughout the course |

| <b>IT-CSP-2: Create digital artifacts that foster creative expression including programs, digital music, videos, images, documents, and combinations of these such as infographics, presentations, and web pages.</b> | <b>CITATION(S)</b>  |
|---|---|
| 2.1 Understand and use software tools by combining and modifying existing artifacts or by creating new artifacts.   | Chapter 3, Lesson 2<br>Supplemental Chapter 1                         |
| 2.2 Collaborate as a team to develop an artifact that represents multiple perspectives.   | Chapter 14  |
| 2.3 Show functionality and suitability (or appropriateness) of a computational artifact.  | Chapter 16  |
| 2.4 Develop a program for creative expression or to satisfy personal curiosity which may have visual, audible, or tactile results.  | Chapter 14  |
| 2.5 Develop a program specifically with the goal of solving a problem, creating new knowledge, or helping people, organizations, or society.  | Many chapter activities involve coded solutions to specific problems. |
| 2.6 Focus on code readability by exchanging code with other students and seeking input.   | Chapter 14, Lesson 1  |
| 2.7 Use computing tools and techniques for creative expression.   | Chapter 14<br>Supplemental Chapter 1                                  |

| <b>IT-CSP-3: Apply abstractions in digital data to explain how bits are grouped to represent higher-level abstractions, such as numbers and characters.</b> | <b>CITATION(S)</b>   |
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| 3.1 Model how a combination of abstractions built upon binary sequences can be used to represent all digital data.  | Chapter 4, Lessons 1, 2<br>Chapter 10, Lesson 4<br>Chapter 17, Lesson 4                        |
| 3.2 Understand levels of all digital data representation (bits, bytes, kilobyte, megabyte, etc.).   | Chapter 4, Lessons 1, 2<br>Chapter 10, Lesson 4  |
| 3.3 Demonstrate appropriate use of data structures, simple files, indexed files, and databases (relational and noSQL).                                      | Chapter 9 (Lists)<br>Suppl. Chapter 2 (File I/O)   |
| 3.4 Show multiple levels of abstraction used in computation.  | Chapter 4, Lessons 1, 2<br>Chapter 9, Lesson 1<br>Chapter 10, Lesson 4<br>Chapter 12, Lesson 4 |
| 3.5 Describe how software is built using low- and high-level abstractions.  | Chapter 4, Lessons 1, 2<br>Chapter 9, Lesson 1<br>Chapter 10, Lesson 4<br>Chapter 12, Lesson 4 |
| 3.6 Explain how binary data is processed using physical layers of computing hardware, including gates, chips, and components.                               | N/A  |
| 3.7 Compare and contrast past, current, and trending programming languages, from low to high levels, used in developing software.                           | N/A  |
| 3.8 Demonstrate skills and knowledge that models different levels of abstraction to represent phenomena.  | Chapter 9, Lesson 1<br>Chapter 10, Lesson 4<br>Chapter 12, Lesson 4<br>Chapter 16, Lesson 3    |

| <b>IT-CSP-4: Design and create computer programs to process and extract information to gain insight and knowledge.</b>                                   | <b>CITATION(S)</b>                              |
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| 4.1 Collaborate to develop hypotheses and questions, and testing hypotheses to answer questions about data to gain insight and knowledge.                | Chapters 14, 17                                 |
| 4.2 Present insight and knowledge gained from data using visualizations, notation, and precise language.   | Chapter 17, Lessons 1, 2, 3                     |
| 4.3 Define use of scalability of systems and analytical approaches as they are used in large data sets.  | Chapter 2, Lessons 3, 4<br>Chapter 18, Lesson 3 |
| 4.4 Understand how models and simulations use abstraction to raise and answer questions.   | Chapter 16, Lesson 3                            |
| 4.5 Provide examples and explanations of how society uses models and simulations to generate new understanding of knowledge.                             | Chapter 16, Lesson 3                            |
| 4.6 Use computing tools to discover a connection in information by computing facilities and cloud hosting environments.                                  | Chapter 17, Lesson 3                            |
| 4.7 Explain how computational manipulations of information require consideration of representation, storage, security, and transmission.                 | Chapter 17, Lessons 1, 2                        |
| 4.8 Debate the trade-offs in representing information as digital data versus analog data.  | Chapter 4, Lesson 1<br>Chapter 17, Lesson 4     |
| 4.9 Justify the format of data storage based upon the principles of many formats of storage, size, and intended use of computationally manipulated data. | Chapter 17, Lesson 4                            |

| <b>IT-CSP-5: Develop, express, implement, and analyze algorithms analytically and empirically.</b>  | <b>CITATION(S)</b>       |
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| 5.1 Develop an algorithm designed to be implemented to run on a computer.   | Chapter 15               |
| 5.2 Explain the building blocks of algorithms: sequencing, selection, iteration, and recursion.   | Chapter 15, Lessons 1, 2 |
| 5.3 Express an algorithm in a spoken language (English) and then in a coding language.  | Chapter 15, Lessons 1, 2 |
| 5.4 Describe the purpose and output variances of each type of language including natural language, pseudo code, and visual and textual programming languages. | Chapter 15, Lessons 1, 2 |
| 5.5 Connect problems to potential algorithmic solutions and explain an example of problems that cannot be solved using algorithms.                            | Chapter 16, Lessons 1, 2 |
| 5.6 Evaluate algorithms analytically and empirically.   | Chapter 16, Lessons 1, 2 |

| <b>IT-CSP-7: Gain insight into the operation of the Internet, study characteristics of the Internet and systems built upon it, and analyze important concerns, such as cybersecurity.</b> | <b>CITATION(S)</b>         |
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| 7.1 Explain the abstractions on the Internet and how the Internet functions.  | Chapter 2, Lessons 1, 2    |
| 7.2 Explain characteristics of the Internet and the interconnected systems which make up the Internet.  | Chapter 2, Lessons 1, 2, 3 |
| 7.3 Analyze how characteristics of the Internet and the systems it connects influence use.  | Chapter 2, Lessons 3, 4    |
| 7.4 Connect the concern of cybersecurity with the Internet and its interconnected systems.  | Chapter 20                 |

| <b>IT-CSP-8: Develop a logical argument from the many ways in which computing enables innovation and our methods for communicating, collaborating, problem solving, and doing business, and analyze the potential benefits and harmful effects of computing in the way people think, work, live, and play.</b> | <b>CITATION(S)</b>                           |
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| 8.1 Analyze how computing affects communication, interaction, and cognition.   | Chapter 18                                   |
| 8.2 Connect computing with innovations in other fields.  | Chapter 16, Lesson 3<br>Chapter 18, Lesson 2 |
| 8.3 Analyze the beneficial and harmful effects of computing.   | Chapter 18                                   |
| 8.4 Connect computing within economic, social, and cultural contexts.  | Chapter 18                                   |

| <b>IT-CSP-9: Review and update personal online career portfolio.</b>  | <b>CITATION(S)</b>   |
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| 9.1 Review and update résumé to reflect new knowledge and skills mastery and additional work experience.  | Chapter 19, Lesson 1   |
| 9.2 Compose an additional cover letter seeking employment for a position representative of new skills, knowledge, and work experience.  | Chapter 19, Lesson 1   |
| 9.3 Replace outdated transcripts to reflect current courses successfully completed.   | Multi-year, student-centric career portfolios are beyond the scope of one course. Selection and maintenance of a preferred, online system is deferred to the district. |
| 9.4 Review and revise existing artifacts to bring them up to date with new skills mastered, as necessary.   |  |
| 9.5 Identify and upload additional industry-appropriate artifacts reflective of mastered skills throughout this course. Write and include a reflective entry for each artifact discussing steps taken, problems encountered and how they were overcome, and other pertinent information about the learning. |  |

| <b>IT-CSP-10: Explore how related student organizations are integral parts of career and technology education courses through leadership development, school and community service projects, entrepreneurship development, and competitive events.</b>  | <b>CITATION(S)</b>   |
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| 10.1 Explain the goals, mission, and objectives of Future Business Leaders of America (FBLA) and/or Technology Student Association (TSA) and/or SkillsUSA.  | Chapter 29, Lesson 4 |
| 10.2 Explore the impact and opportunities a student organization (FBLA, TSA, SkillsUSA) can develop to bring business and education together in a positive working relationship through innovative leadership and career development programs.  | Chapter 29, Lesson 4 |
| 10.3 Explore the local, state, and national opportunities available to students through participation in related student organizations (FBLA, TSA, SkillsUSA) including but not limited to conferences, competitions, community service, philanthropy, and other student organization activities. | Chapter 29, Lesson 4 |
| 10.4 Explain how participation in career and technology education student organizations can promote lifelong responsibility for community service and professional development.   | Chapter 29, Lesson 4 |
| 10.5 Explore the competitive events related to the content of this course and the required competencies, skills, and knowledge for each related event for individual, team, and chapter competitions.   | Chapter 29, Lesson 4 |