CompuScholar, Inc.

Alignment to the Arizona Computer Science Standards

9th - 12th Grades

Arizona Standards Information:

CS Page	Arizona Computer Science Education Page
Standards Link:	Arizona Computer Science Standards for High School (2018)

CompuScholar Courses in this Grade Band:

Course Title:	**Digital Savvy**, ISBN 978-0-9887070-8-5 Course Description and Syllabus
Course Title:	**Web Design**, ISBN 978-0-9887070-3-0 Course Description and Syllabus
Course Title:	**Python Programming**, ISBN 978-1-946113-00-9 Course Description and Syllabus
Course Title:	**Java Programming (Abridged)**, ISBN 978-0-9887070-4-7 Course Description and Syllabus
Course Title:	**Java Programming (AP)**, ISBN 978-0-9887070-2-3 Course Description and Syllabus
Course Title:	**Windows Programming with C#**, ISBN 978-0-9887070-0-9 Course Description and Syllabus
Course Title:	**Unity Game Programming**, ISBN 978-0-9887070-7-8 Course Description and Syllabus

High schools can use any desired combination of CompuScholar courses to meet performance standards. Entire courses can be completed in sequential years or elements of selected courses can be combined in a single year.

Arizona Computer Science Standards (9th - 12th Grades)

Computing Systems	COMPUSCHOLAR ALIGNMENT
Devices	
HS.CS.D.1 - Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects.	Our courses contain lessons that describe how various hardware components (e.g. CPU, RAM, disk drives) encapsulate computing tasks such as processing, short-term storage and long-term
Hardware & Software	
HS.CS.HS.1 - Describe levels of abstraction and interactions between application software, system software, and hardware layers.	Our courses describe the relationships between hardware, operating systems, device drivers, and a variety of end-user applications.

Troubleshooting	
HS.CS.T.1 - Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.	Our courses contain dedicated troubleshooting and debugging information for relevant technology. The programming courses describe how to use a variety of debugging approaches, including code analysis, tracing (logging) and setting breakpoints in a debugger. Best practices and common troubleshooting tips are provided as needed.

Network & The Internet	COMPUSCHOLAR ALIGNMENT
Network Communication & Organization	
HS.NI.NCO.1 - Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.	Our courses describe networking components and common network topology. IP addresses, MAC addresses and URLs are introduced for identification of devices and online resources.
Cybersecurity	
HS.NI.C.1 - Describe how sensitive data can be affected by malware and other attacks.	Our courses contain chapters or lessons on security topics, including physical vs. electronic security mechanisms where relevant.
HS.NI.C.2 - Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts.	Our courses contain chapters or lessons on relevant security topics such as encryption (including SSL/TLS), online safety and privacy, protecting personal information online, and establishing defenses against mal-ware and viruses.
HS.NI.C.3 - Compare various security measures, considering tradeoffs between the usability and security of a computing system.	Our courses contain chapters or lessons on security topics, including physical vs. electronic security mechanisms where relevant.

Data Analysis	COMPUSCHOLAR ALIGNMENT
Storage	
HS.DA.S.1 - Translate between different bit representations of real-world phenomena, such as characters, numbers, and images.	Our courses cover numbering systems such as binary, decimal and hexadecimal. The encoding of data, including ASCII character and color representations is discussed where relevant.
HS.DA.S.2 - Evaluate the tradeoffs in how and where data is stored.	Our courses cover representation of data in multiple formats, from simple encoding of data types up through data structures and object definitions with properties. Choices of data type, data structure, or object definitions have pros and cons and may impact the desirable characteristics of the program or the maintainability of the underlying code.

Collection, Visualization & Transformation	
HG.DA.CVT.1 - Create interactive data visualizations using software tools to help others better understand real-world phenomena.	Our courses contain opportunities to explore and represent real-world data in the form of equations, charts and graphs and similar tools.
Inference & Models	
HS.DA.IM.1 - Analyze computational models to better understand real-world phenomena.	Student-driven projects give opportunities for analysis and representation of real-world data.

Algorithms & Programming	COMPUSCHOLAR ALIGNMENT
Algorithms	
HS.AP.A.1 - Create prototypes that use algorithms for practical intent, personal expression, or to address a societal issue	Our courses describe how to use flowcharts to design algorithms to solve specific problems. Common sorting and searching algorithms or game-specific AI
Variables	
HS.AP.V.1 - Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.	Our programming courses cover simple data structures such as arrays and lists. Students will use each data structure in hands-on projects.
Control	
HS.AP.C.1 - Justify the selection of specific control structures and explain the benefits and drawbacks of choices made, when tradeoffs involve readability and program performance.	Our courses cover traditional flow control structures (conditionals, loops, functions) and the trade-offs in design, including selecting between appropriate flow control logic.
HS.AP.C.2 - Use events that initiate instructions to design and iteratively develop computational artifacts	Our courses cover relevant event-driven programming responses (e.g. handling button clicks, game loop timers, and other user actions).
Modularity	
HS.AP.M.1 - Decompose problems into smaller components using constructs such as procedures, modules, and/or objects.	Our courses cover Object-Oriented Programming (OOP), modular programming with functions, and functional decomposition of complex tasks down to manageable logical blocks.
HS.AP.M.2 - Use procedures within a program, combinations of data and procedures, or independent but interrelated programs to design and iteratively	Team projects and other labs give students the opportunity to incorporate real-world data in the creation of their own digital artifacts and programs.
Program Development	
HS.AP.PD.1 - Evaluate and refine computational artifacts to make them more usable and accessible.	Our courses contain team projects that allow students to define, design, build and test a unique project using standard SDLC stages and traditional requirements, design and test documentation.
HS.AP.PD.2 - Use team roles and collaborative tools to design and iteratively develop computational artifacts.	Our courses contain team projects that allow students to define, design, build and test a unique project using standard SDLC stages.

HS.AP.PD.3 - Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.	Our courses contain team projects that allow students to define, design, build and test a unique project using standard SDLC stages and traditional requirements, design and test documentation. Accessibility concerns are addressed as needed.

Impacts of Computing	COMPUSCHOLAR ALIGNMENT
Culture	
HS.IC.C.1 - Evaluate the ways access to computing impacts personal, ethical, social, economic, and cultural practices.	Our courses contain relevant lessons on the global impact of computing, ethical computing concepts, intellectual property and licensing, careers in computing, etc.
HS.IC.C.2 - Test and refine computational artifacts to reduce bias and equity deficits.	Students are presented with examples and projects that are free from bias and inequity, and are similarly encouraged to follow ethical practices in their own development.
HS.IC.C.3 - Demonstrate ways a given algorithm applies to problems across disciplines.	Our courses cover a variety of algorithms that can be applied to real-world situations in mathematics, physics, economics, etc.
Social Interactions	
HS.IC.SI.1 - Analyze the impact of collaborative tools and methods that increase social connectivity.	Our courses contain team projects with opportunities for collaboration using relevant tools and self or teacher-directed topics.
Safety, Law & Ethics	
HS.IC.SLE.1 - Explain the beneficial and harmful effects that intellectual property laws can have on innovation.	Our courses cover intellectual property laws, copyright considerations and various types of software licensing.
HS.IC.SLE.2 - Explain the privacy concerns related to the collection and generation of data through automated processes that may not be evident to users.	Students are taught to minimize their personal information shared online. They will learn about their personal digital footprint and understand that digital identities and online actions have long-term or permanent consequences.
HS.IC.SLE.3 - Evaluate the social and economic implications of privacy in the context of safety, law, or ethics.	Our courses cover computing ethics, copyrights, intellectual property, personal privacy and computer security. Relevant laws are discussed in each lesson.