



# CodeHS

## Arizona Software and App Design I Syllabus

1 year for High School (170-180 contact hours)

### Course Overview and Goals

The Arizona Software and App Design I Course is intended to teach students the fundamentals of web design and development in a project-based learning environment. Students will learn the basic elements of web development, such as web hosting, creating HTML/CSS files, and incorporating Javascript into HTML files. Students will also learn about digital citizenship and software security techniques. Over the course of the school year, students will collaboratively and independently design, develop and implement functional and responsive web pages using these foundational skills.

**Learning Environment:** The course utilizes a blended classroom approach. The content is fully web-based, with students writing and running code in the browser. Teachers utilize tools and resources provided by CodeHS to leverage time in the classroom and give focused 1-on-1 attention to students. Each unit of the course is broken down into lessons. Lessons consist of video tutorials, short quizzes, example programs to explore, and written programming exercises, adding up to over 100 hours of hands-on programming practice in total. Several units end with a comprehensive unit test that assesses student's mastery of the material from that unit as well as challenge problems where students can display their understanding of the material.

**Development Environment:** Students write and run HTML, CSS, and JavaScript files in the browser using the CodeHS editor. Due to the fact that different browsers treat HTML and CSS differently, we highly recommend that all student computers use an up-to-date version of the Chrome browser. You can download an up-to-date version of Chrome for free here: <https://www.google.com/chrome/browser/>

**More information:** Browse the content of this course at <https://codehs.com/course/20568/>

**Prerequisites:** There are no official prerequisites for the CodeHS Arizona Software and App Design I course. The course is designed for students with some previous background in computer science.

### Technology Requirements

To complete all activities and exercises in this course, students must have access to the 3rd party sites and tools listed here: [Arizona Software and App Design I Course Links](#)

### Course Breakdown

#### Unit 1: Digital Citizenship and Cybersecurity (2 weeks / 10 hours)

This module includes topics on Internet etiquette and how to stay safe on the world wide web. Students will also look at the potential effects of our digital footprints, how to protect information from online risks, and the implications of cyberbullying. Finally, the module includes how to find and cite quality resources online.

Objectives / Topics Covered	<ul style="list-style-type: none"><li>• What is Cybersecurity?</li><li>• Impact of Cybersecurity</li><li>• The CIA Triad</li></ul>
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	<ul style="list-style-type: none"> <li>● Digital Footprint and Reputation</li> <li>● Cyberbullying</li> <li>● Internet Safety</li> <li>● Privacy and Security</li> <li>● Privacy Acts and Regulations</li> <li>● Information Literacy</li> <li>● Creative Credit and Copyright</li> <li>● Hacking Ethics</li> </ul>
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## Unit 2: HTML - Structuring Websites (3 weeks / 15 hours)

Students learn about the language behind all websites: HTML. Students learn about several different HTML tags as well as the basic structure of a web page. Students use HTML to develop several of their own creative web pages.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>● How do we build web pages?</li> <li>● Markup Languages</li> <li>● HTML</li> <li>● HTML tags</li> <li>● HTML attributes</li> <li>● HTML elements</li> <li>● The Anatomy of an HTML page</li> <li>● Formatting text</li> <li>● Hyperlinks</li> <li>● Images</li> <li>● Copyright fair use</li> <li>● Lists</li> <li>● Nesting tags</li> <li>● Tables</li> <li>● Styling with HTML</li> <li>● HTML Colors</li> </ul>
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## Unit 3: CSS - Styling Websites (2 weeks / 10 hours)

Students learn the language CSS and use it to style their web pages. Students learn about the benefits of styling with CSS and will use CSS to create several styled web pages of their own.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>● How do we style web pages?</li> <li>● CSS vs HTML</li> <li>● CSS Selectors</li> <li>● Selecting by tag</li> <li>● Selecting by class</li> <li>● Selecting by id</li> <li>● The Cascade (order of selector precedence)</li> </ul>
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## Unit 4: Advanced HTML and CSS (4-5 weeks / 20-25 hours)

This module dives deeper into different things we can do with HTML and CSS. Students practice advanced topics in HTML and CSS, including visibility, image filtering, interaction, and animation, to develop more advanced websites.

Objectives / Topics	<ul style="list-style-type: none"> <li>● Splitting your site into separate files</li> </ul>
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Covered	<ul style="list-style-type: none"> <li>• Iframes and embedding</li> <li>• &lt;div&gt;</li> <li>• &lt;span&gt;</li> <li>• Combining CSS selectors</li> <li>• Special CSS selectors</li> <li>• Reading documentation</li> <li>• Avoiding repeated code</li> <li>• Visibility</li> <li>• Positioning</li> <li>• Image manipulation</li> <li>• Animation</li> <li>• Interaction</li> <li>• CSS Frameworks</li> </ul>
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### Unit 5: Project - Create Your Homepage (2 weeks / 10 hours)

Students build their own websites about themselves. This site will be accessible on their own custom domain and will be continually improved by the student as they continue on in the course. It will serve as a running portfolio of each creative project they create in the course.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>• Software Development Life Cycle</li> <li>• Combination of the concepts learned thus far</li> <li>• Allow students to think creatively about applications of the concepts they have learned</li> <li>• Designing a web page from scratch</li> <li>• Creating accessible web pages</li> </ul>
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### Unit 6: Introduction to JavaScript in HTML (3 weeks / 15 hours)

Students learn about the script tag, and how it can be used to write JavaScript code in their HTML files. Students are also introduced to useful JavaScript methods that can be used to alter the state of the CSS and HTML of a webpage, as well as how the Document Object Model supports the ability to make such changes.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>• The Script Tag</li> <li>• Using the DOM</li> <li>• Creating Elements Using the DOM</li> <li>• Styling Elements Using JavaScript</li> <li>• Functions in HTML</li> <li>• This Keyword</li> <li>• Keyboard Interactions</li> <li>• JavaScript Animations</li> <li>• Positioning and Animations</li> </ul>
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### Unit 7: Using JavaScript Libraries (2 weeks / 10 hours)

Students are introduced to jQuery, a JavaScript library that makes webpage interaction easier. Students will learn the basic syntax of jQuery, how to incorporate it in their webpages, and useful methods that help animate and change the responsiveness of their websites.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>• Introduction to jQuery</li> <li>• Iterating with jQuery</li> </ul>
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	<ul style="list-style-type: none"> <li>• Animations with jQuery</li> <li>• Callback Functions and Synchronization</li> <li>• Using Multiple Files in JavaScript</li> </ul>
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### Unit 8: Project: Build an Interactive Resume (2-3 weeks / 10-15 hours)

Students will create a single page, interactive resume. Students will be expected to add several animations using jQuery to prove their ability to modify HTML and CSS. This unit also examines web design theories that can help students improve the aesthetics of their resumes, and to evaluate the quality of a website based on its layout.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>• Creating a Resume</li> <li>• Layout and Web Design Theory</li> <li>• Interactive Resume Development</li> </ul>
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### Unit 9: Storing and Collecting Data (3-4 weeks / 15-20 hours)

This unit will explore the role that data plays in creating websites. Students will learn about the various ways that data is taken from web pages, as well as ways to secure themselves from unwanted data collection. Students will also learn how to incorporate data collection into their own websites, and collect simple information from users.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>• Collecting and Storing Data</li> <li>• Storing Data with Local Storage</li> <li>• Storing Data Structures with Local Storage</li> <li>• JavaScript Objects</li> <li>• Using Input Fields</li> <li>• Server-side Languages</li> </ul>
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### Unit 10: How to Build and Maintain a Website (2 weeks / 10 hours)

While students can run functional and responsive websites on CodeHS, this unit explores how students can create and run websites without the help of CodeHS. This unit will explore how to store web files, secure a domain name, and maintain a website. The majority of the lessons will be explanatory - students will not be expected to host and maintain a webpage off CodeHS, but will be given the tools needed to do so if they desire.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>• Choosing a Domain Name</li> <li>• Personal Servers vs Web Servers</li> <li>• Web Optimization</li> <li>• Choosing a CMS</li> <li>• Web Accessibility</li> <li>• Web Security</li> </ul>
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### Unit 11: Project - Software Security (3-4 weeks / 15-20 hours)

In this module, students will learn what happens when running a web application and how to look inside web apps using developer tools, source code, and more. They will learn basic SQL and common attacks like SQLi. Students will also be able to recommend solutions for flawed security systems.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>• Inside Web Applications</li> <li>• Developer Tools</li> <li>• The Value of Data</li> </ul>
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	<ul style="list-style-type: none"> <li>• SQL Overview</li> <li>• What is SQL?</li> <li>• Structuring Data in SQL</li> <li>• Basic Querying in SQL</li> <li>• Filtering Queries in SQL</li> <li>• Clients, Servers</li> <li>• Databases</li> <li>• Common Security Problems</li> <li>• SQL Injection</li> <li>• SQLi Overview</li> <li>• Types of SQLi</li> <li>• Preventing SQLi</li> </ul>
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### **Unit 12: Project - Iterate Your Web Development (2-3 weeks / 10-15 hours)**

Students will continue the creation of their website and improve upon their design using feedback. The website will have to follow specific criteria - certain number of pages, responsiveness, and use of APIs. Students will go through a feedback process, and learn about making their websites more accessible to a wide array of users.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>• Providing Feedback</li> <li>• Presenting Your Innovation</li> </ul>
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### **Unit 13: Computer Science Careers (2 weeks / 10 hours)**

Students take some time to explore and discover different computer science careers and professional student organizations. They will also examine inclusive coding and how to avoid bias in computer programming.

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>• Computer Science Careers</li> <li>• Inclusive Coding</li> <li>• Career &amp; Technical Student Organizations (CTSO)</li> </ul>
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