



# CodeHS

## Texas Web Design Syllabus

### Course Overview and Goals

In today's world, web pages are the most common medium for sharing ideas and information. Learning to design websites is an incredibly useful skill for any career path.

The CodeHS Texas Web Design course is a project-based course that teaches students how to build their own web pages. Students will learn the languages HTML and CSS, and will create their own live homepages to serve as portfolios of their creations. By the end of this course, students will be able to explain how web pages are developed and viewed on the Internet, analyze and fix errors in existing websites, and create their very own multi page websites. Students will learn the foundations of user interface design, rapid prototyping and user testing, and will work together to create professional, mobile responsive websites, as well as foundational cybersecurity topics including digital citizenship and cyber hygiene, software security, networking fundamentals, and basic system administration and all through the CodeHS web-based platform.

**Learning Environment:** The course utilizes a blended classroom approach. The content is fully web-based, with students writing HTML and CSS 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 web pages to explore, and web design exercises in which students develop and publish their own web sites.

**Development Environment:** Students write HTML and CSS code in the browser using the CodeHS online editor. Classes can choose to write code using either blocks or text. 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/>

**Quizzes:** Each lesson includes at least one formative short multiple choice quiz. At the end of each unit, students take a summative multiple choice unit quiz that assesses their knowledge of the concepts covered in the unit.

**Prerequisites:** There are no official prerequisites for the CodeHS Web Design course. The course is designed for complete beginners with no previous background in computer science. The course is highly visual, dynamic, and interactive, making it engaging for new students. In the broader course pathway, the Web Design course is a great starting place. However, students that have taken other CodeHS courses will be able to apply concepts learned in earlier courses to Web Design, making Web Design a great second or third course in the pathway.

**More information:** Browse the content of this course at <https://codehs.com/course/9609>

### Course Breakdown

**Module 1: System Administration and IT Infrastructure (3-4 weeks/15-20 hours)**

Students will learn about the physical elements of computers and networking such as motherboards, RAM, routers, and the use of port numbers, ethernet and wireless devices. Browse the full content of this module at <https://codehs.com/library/course/9609/module/14405>

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>● Internal Components of a Computer</li> <li>● Peripheral Devices</li> <li>● Network Devices</li> <li>● Storage and Network Options</li> <li>● Network Communication</li> <li>● Network Management</li> </ul>
Example Assignments / Labs	<ul style="list-style-type: none"> <li>● Different Types of CPU</li> <li>● RAM vs. Hard Drive</li> <li>● Wireless Internet Connections <ul style="list-style-type: none"> <li>○ Speed Test</li> </ul> </li> <li>● Security of Cloud Storage</li> <li>● Ethernet Standards</li> <li>● Setting Up a Firewall <ul style="list-style-type: none"> <li>○ Establish Firewall Rules</li> </ul> </li> </ul>

### Module 2: Networking Fundamentals (3-4 weeks/15-20 hours)

This module explores the structure and design of the internet and networks, and how this design affects the reliability of network communication, the security of data, and personal privacy. We will learn how the Internet connects computers all over the world. Finally, we will explore basic networking protocols, practical networking, and how networks are secured. Browse the full content of this module at <https://codehs.com/library/course/9609/module/14406>

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>● Introduction to the Internet</li> <li>● Internet Hardware</li> <li>● Internet Addresses</li> <li>● Domain Name System (DNS)</li> <li>● Routing</li> <li>● Packets and Protocols</li> <li>● The Internet and Cybersecurity</li> <li>● Impact of the Internet</li> <li>● Network Hacks</li> <li>● Securing a Network</li> </ul>
Example Assignments / Labs	<ul style="list-style-type: none"> <li>● Introduction to the internet <ul style="list-style-type: none"> <li>○ What is the Internet? How does it work? What have been its impact on society?</li> <li>○ Why do we need protocols for the Internet?</li> <li>○ Example Activity <ul style="list-style-type: none"> <li>■ Explore the different levels of the internet.</li> </ul> </li> </ul> </li> <li>● Internet hardware <ul style="list-style-type: none"> <li>○ Vocabulary: bandwidth, bitrate, latency</li> <li>○ Why are protocols so important?</li> <li>○ How do we send data over the Internet?</li> <li>○ Example Activities <ul style="list-style-type: none"> <li>■ Explore how data is able to be transmitted across the ocean</li> </ul> </li> </ul> </li> </ul>

- by using underwater cables
  - Explore the role of simple and complex networks and routers
- Internet Addresses
  - Vocabulary: Internet Protocol (IP)
  - How do IP addresses compare to postal addresses?
  - How IP addresses work?
  - Example Activities
    - Explore the differences between IPv4 and IPv6. Why are we running out of addresses?
    - Trace a website request from the server, through the network, and to your computer
- Domain Name System (DNS)
  - How does DNS help with sending digital information and IP addresses?
  - Example Activities
    - Explore the process of how requesting a web resource works
- Routing
  - How is routing used to send messages / data?
  - Why is redundancy a good thing for the Internet? (fault tolerant)
- Packets and Protocols
  - How data is transmitted?
  - How are internet packets able to find their way to your computer?
  - Example Activities:
    - Explain in your own words how a request from your computer travels through the various levels of servers to reach and return the correct webpage and resources?
    - As a class, create a protocol that will allow one classmate to send another classmate a note, without the need for talking to each other.
  - What are the standard protocols for the Internet and how do they work? (TCP/IP, HTTP)
- The Internet and Cybersecurity
  - What are cybercrime and cyberwarfare?
  - How do we network attacks? (certificate authorities, public key encryption)
- Network Hacks
  - What are common network attacks?
  - Explain common network attacks and how they happen. (DNS spoofing, DoS/DDoS, Waterhole attacks, fake WAP, eavesdropping)
- Securing a Network
  - How can we detect intrusions? (checking logs, firewall rules, intrusion detection systems - IDS)
  - What are some recommended approaches for mitigating or preventing network attacks?

### **Module 3: Digital Citizenship and Cyber Hygiene (2-3 weeks/10-15 hours)**

This module includes topics on Internet etiquette and how to stay safe on the world wide web. We 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. Browse the full content of this module at: <https://codehs.com/library/course/9609/module/14407>

Objectives / Topics Covered	<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>● Information Literacy</li> <li>● Creative Credit and Copyright</li> <li>● Hacking Ethics</li> </ul>
Example Assignments / Labs	<ul style="list-style-type: none"> <li>● Digital Footprint and Reputation <ul style="list-style-type: none"> <li>○ What is a digital footprint?</li> <li>○ What is <b>your</b> digital footprint and reputation?</li> <li>○ What does it mean that the internet is public and permanent?</li> <li>○ Who looks at your digital footprint and reputation?</li> <li>○ What are some recommended social media guidelines?</li> <li>○ How can you maintain your digital footprint?</li> <li>○ What does your digital footprint say about you?</li> <li>○ Example activities: <ul style="list-style-type: none"> <li>■ What is your digital footprint?</li> <li>■ Are you going to make any changes in what you post on social media?</li> </ul> </li> </ul> </li> <li>● Cyberbullying <ul style="list-style-type: none"> <li>○ What is cyberbullying?</li> <li>○ What are the impacts of cyberbullying?</li> <li>○ Are there cyberbullying roles?</li> <li>○ What do you do if you are being bullied?</li> <li>○ What do you do if you see bullying?</li> <li>○ How can you be an upstander?</li> <li>○ Example activities: <ul style="list-style-type: none"> <li>■ Explore cyberbullying scenarios: What would you do?</li> </ul> </li> </ul> </li> <li>● Internet Safety <ul style="list-style-type: none"> <li>○ What are some ways to stay safe online?</li> <li>○ What are some online safety guidelines?</li> <li>○ Example activities: <ul style="list-style-type: none"> <li>■ Explore Internet safety scenarios: What would you do?</li> </ul> </li> </ul> </li> <li>● Privacy and Security <ul style="list-style-type: none"> <li>○ What are data privacy and security?</li> <li>○ How can you keep personal data secure and private?</li> <li>○ What can happen if you data is stolen and what can you do about it?</li> <li>○ Example activities: <ul style="list-style-type: none"> <li>■ Test out various passwords on a site</li> <li>■ Explore Google's privacy policy: What do they know about you?</li> </ul> </li> </ul> </li> <li>● Information Literacy <ul style="list-style-type: none"> <li>○ What is information literacy?</li> <li>○ How can you do effective internet searches?</li> <li>○ What are some techniques for judging source legitimacy and identifying misinformation?</li> <li>○ Example activities: <ul style="list-style-type: none"> <li>■ Create and test search queries</li> <li>■ Explore evidence for using sources</li> </ul> </li> </ul> </li> <li>● Creative Credit and Copyright</li> </ul>

	<ul style="list-style-type: none"> <li>○ What is copyright?</li> <li>○ What are the different types of copyright licenses</li> <li>○ Example activities: <ul style="list-style-type: none"> <li>■ Create citations for sources</li> <li>■ Explore image search tools</li> </ul> </li> <li>● Hacking Ethics <ul style="list-style-type: none"> <li>○ What are hackers?</li> <li>○ Are there different kinds of hackers? (white, black, grey)</li> <li>○ What are bug bounty programs?</li> <li>○ Is hacking always illegal?</li> <li>○ What are the consequences of illegal hacking?</li> <li>○ Example activities: <ul style="list-style-type: none"> <li>■ Explore what penetration testing is</li> <li>■ Sign ethical hacker agreement</li> </ul> </li> </ul> </li> </ul>
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#### Module 4: Benchmark One: Building a Cyber-Hygiene Campaign (1 week/ 6 hours)

In this module, students will develop and implement a cyber-hygiene campaign meant to educate professionals about how they can protect their personal information. Students will watch successful non-profit and business campaigns, and evaluate why they are successful in an attempt to create one of their own. Browse the content of the module here: <https://codehs.com/library/course/9609/module/14408>

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>● What makes an effective campaign?</li> </ul>
Assignments / Labs	<ul style="list-style-type: none"> <li>● What makes an effective campaign <ul style="list-style-type: none"> <li>○ Evaluate successful campaigns</li> </ul> </li> <li>● Creating your campaign</li> </ul>

#### Module 5: Web Development (3 weeks/ 15 hours)

In this module, students will go through a high level introduction to HTML, CSS, and the processes involved in viewing web pages on the internet. Students will create several simple web pages using the CodeHS online editor to gain practice using the various features of HTML and CSS. Browse the full content of this module here: <https://codehs.com/library/course/9609/module/14409>

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> </ul>
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	<ul style="list-style-type: none"> <li>● Styling with HTML</li> <li>● HTML ColorsHow 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>
Assignments / Labs	<ul style="list-style-type: none"> <li>● Students create several web pages to practice each of the concepts above</li> <li>● Example exercises: <ul style="list-style-type: none"> <li>○ Modify existing web pages using formatting tags to make text more readable</li> <li>○ Use links to create a web page linking to your 5 favorite websites</li> <li>○ Use links and images to create a personal library web page showing your favorite books</li> <li>○ Use lists and images to create a flashy list article</li> <li>○ Use tables to create a personal calendar web page</li> </ul> </li> <li>● Use styling attributes to add style to your web pages</li> <li>● Students create several web pages to practice each of the concepts above</li> <li>● Example exercises: <ul style="list-style-type: none"> <li>○ Use CSS selectors to style your previous web pages</li> <li>○ Use CSS selectors to style new web pages</li> <li>○ Create a music library web page and use CSS to style each song in your table</li> <li>○ Use CSS styling to make several images fit together properly</li> <li>○ Explain the benefits CSS provides over styling with only HTML</li> <li>○ Identify CSS selectors and rules used on example web pages</li> </ul> </li> </ul>

### Module 6: Advanced HTML and CSS (6 weeks/30 hours)

This module covers advanced topics in HTML and CSS, such as developing multi file websites, and how to structure web pages using concepts of design. Students will use these skills to eventually create a multi file website. Browse the full content of this module at: <https://codehs.com/library/course/9609/module/14410>

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>● Splitting your site into separate files</li> <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> </ul>
Assignments / Labs	<ul style="list-style-type: none"> <li>● Example exercises: <ul style="list-style-type: none"> <li>○ Use iframes to embed a video into your web page</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Use iframes to embed a previous exercise into your web page</li> <li>○ Use divs and spans to style groups of HTML elements</li> <li>○ Add CSS styling to elements that the user clicks on</li> <li>○ Add CSS styling to elements that the user hovers over</li> <li>○ Use CSS to add a black and white filter to a group of images</li> <li>○ Use CSS to add a blur filter to a group of images</li> <li>○ Use CSS animations to make your site slowly fade in over time</li> </ul>
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### Module 7: Benchmark Two: Create a Campaign Site (2 weeks/10 hours)

This module takes the skills that students have developed in web design, and has them apply it to the development of their own website that specifically educates users about best practice for cybersecurity. Students spend time developing their website, and considering what makes a message effective. Browse the full content of this module at: <https://codehs.com/library/course/9609/module/14411>

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>● Website layout and design</li> </ul>
Assignments / Labs	<ul style="list-style-type: none"> <li>● Research: Layout and Design <ul style="list-style-type: none"> <li>○ What makes a website aesthetically pleasing?</li> </ul> </li> <li>● Creating your Campaign Website</li> </ul>

### Module 8: Introduction to JavaScript (5-6 weeks (35 hours)

This module introduces students to the basics of JavaScript, and gives students practice writing JavaScript programs to solve general problems, as well as how to incorporate JavaScript into their webpages. Other topics in this unit include APIs, the importance of programming style, and the impact programming has had on the types of problems that can be solved. Browse the full content of this module at:

<https://codehs.com/library/course/9609/module/14412>

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>● Variables</li> <li>● User Input</li> <li>● Arithmetic ExpressionsBooleans</li> <li>● For Loops</li> <li>● Conditionals</li> <li>● Nested Control Structures</li> <li>● While Loops</li> <li>● Functions with and without parameters</li> <li>● Functions with and without return values</li> <li>● Nested Control Structures</li> <li>● Local variables and scope</li> </ul>
Assignments / Labs	<ul style="list-style-type: none"> <li>● Using comparison and logical operators to control the flow of the program <ul style="list-style-type: none"> <li>○ Example Exercise: Inventory Write a program that keeps track of a simple inventory for a store. While there are still items left in the inventory, ask the user how many items they would like to buy. Then print out how many are left in inventory after the purchase. You should use a while loop for this problem. Make sure you catch the case where the user tries to buy more items than</li> </ul> </li> </ul>

	<p>there are in the inventory. In that case, you should print a message to the user saying that their request isn't possible.</p> <ul style="list-style-type: none"> <li>● Using for loops <ul style="list-style-type: none"> <li>○ Example Exercise: All Dice Values <ul style="list-style-type: none"> <li>■ Write a program that prints all possible dice rolls with 2 dice. To do so, you should use a double for loop. Hint: You can't use i for both for loops.</li> </ul> </li> </ul> </li> <li>● Using various kinds of functions such as functions with and without parameters, and functions with and without return values <ul style="list-style-type: none"> <li>○ Example Exercise: Is it even? Write a function called isEven that returns a boolean of whether or not a value is even or odd. The isEven function should not print anything out or return a number. It should only take in a number and return a boolean. Once you've written this function, write a program that asks the user for integers and prints whether the number they entered is even or odd using your isEven function. You should let the user keep entering numbers until they enter the SENTINEL given.</li> </ul> </li> </ul>
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### Module 9: Benchmark Three: Creating an Interactive Training Tool (1 weeks/6 hours)

In this module, students develop an interactive training tool to add to their functional website. This tool is meant to assess user knowledge on the topics they have covered on the website. Students learn how to plan out the development of such a tool using top down design, as well as how to develop a project timeline. Browse the full content of this module at: <https://codehs.com/library/course/9609/module/14413>

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>● Project Timeline Management</li> <li>● Top Down Design</li> </ul>
Assignments / Labs	<ul style="list-style-type: none"> <li>● Using Top Down Design <ul style="list-style-type: none"> <li>○ What are Top Down Design Best Practices</li> </ul> </li> <li>● Creating a Project Timeline <ul style="list-style-type: none"> <li>○ Using Gantt Charts</li> </ul> </li> <li>● Creating Your Interactive Training Tool</li> </ul>

### Module 10: Benchmark Four: Finalizing your Campaign Site with Feedback (3 weeks/15 hours)

In this module, students will finalize their website by providing and receiving feedback from their peers in a constructive and articulate manner to help improve their sites. Students will learn about accessibility measures that should be implemented on websites, as well as how to evaluate the strength of a website using a rubric. Browse the full content of this module at: <https://codehs.com/library/course/9609/module/14414>

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>● What makes an engaging interface?</li> <li>● Various User Interface (UI) Design techniques</li> <li>● Accessibility issues</li> <li>● Readability</li> <li>● Rapid prototyping</li> <li>● User testing</li> </ul>
Assignments / Labs	<ul style="list-style-type: none"> <li>● Example exercises:</li> </ul>

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|  | <ul style="list-style-type: none"><li>○ Research existing user interfaces</li><li>○ Assess the user interfaces of various web sites</li><li>○ Research a problem, and gather empathy and insights for stakeholders who are involved in the problem</li><li>○ Create a problem statement based on user research</li><li>○ Generate potential solutions for a problem</li><li>○ Prototype and test several solutions</li><li>○ Use</li><li>○ Design a website using paper prototypes, test these prototypes and get feedback from your peers, and improve your design before implementing it with code</li><li>○ UI Design Project<ul style="list-style-type: none"><li>■ Find and present an article about a particular UI design technique</li><li>■ Create your own live examples using this technique</li></ul></li></ul> |
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