CodeHS

Georgia Introduction to Digital Technology Course Syllabus

Course Overview and Goals

This is the first course required for all of Georgia's IT pathways. This course is designed for students to understand, communicate, and adapt to a digital world as it impacts their personal life, society, and the business world. Exposure to foundational knowledge in hardware, software, programming, web design, IT support, and networks are all taught with hands-on activities and project focused tasks. Various forms of technologies will be highlighted to expose students to the emerging technologies impacting the digital world.

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.

Programming Environment: For the programming units, students write and run JavaScript programs in the browser using the CodeHS editor. For the web design unit, 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.

More information: Browse the content of this course at https://codehs.com/course/6427

Prerequisites

The Georgia Introduction to Digital Technology 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 coders.

Course Breakdown

Unit 1: Digital Citizenship and Cyber Hygiene (5 weeks/25 hours)
This unit focuses on why cybersecurity is important, recent threats to cybersecurity, and different careers in the field. It includes topics on Internet etiquette and how to stay safe on the world wide web. Students will also look at the potential effects of their 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/6427/module/9284

Objectives / Topics Covered	- What is Cybersecurity? - The CIA Triad - Digital Footprint and Reputation

	● Cyberbullying ● Internet Safety ● Privacy and Security ● Information Literacy ● Visualizing and Interpreting Data ● Data Collection and Limitations ● Creative Credit and Copyright ● Hacking Ethics ● Project: PSA

Example Assignments / Labs	● What is Cybersecurity?
	  ○ Cybersecurity defined
	  ○ Why is cybersecurity important?
	  ○ Cybersecurity in the news
	  ○ Cybersecurity and IoT (Internet of Things)
	  ○ How do we prevent cyber attacks?
	  ○ Example activities:
	    ■ Summarize and discuss recent cyber attacks
	    ■ Explore a threat map to see where cyber attacks are coming from and which countries are being targeted
	● The CIA Triad
	  ○ What is the CIA triad? (confidentiality, integrity, availability)
	  ○ What are "secure systems?"
	  ○ What do confidentiality, integrity, and availability mean in cybersecurity?
	  ○ Example activities:
	    ■ Determine where scenarios break part of the CIA Triad
	● Digital Footprint and Reputation
	  ○ What is a digital footprint?
	  ○ What is *your* digital footprint and reputation?
	  ○ What does it mean that the internet is public and permanent?
	  ○ Who looks at your digital footprint and reputation?
	  ○ What are some recommended social media guidelines?
	  ○ How can you maintain your digital footprint?
	  ○ What does your digital footprint say about you?
	  ○ Example activities:
	    ■ What is your digital footprint?
	    ■ Are you going to make any changes in what you post on social media?
	● Cyberbullying
	  ○ What is cyberbullying?
	  ○ What are the impacts of cyberbullying?
	  ○ Are there cyberbullying roles?
	  ○ What do you do if you are being bullied?
	  ○ What do you do if you see bullying?
	  ○ How can you be an upstander?
	  ○ Example activities:
	    ■ Explore cyberbullying scenarios: What would

you do?
- Internet Safety
  - What are some ways to stay safe online?
  - What are some online safety guidelines?
  - Example activities:
    - Explore Internet safety scenarios: What would you do?
- Privacy and Security
  - What are data privacy and security?
  - How can you keep personal data secure and private?
  - What can happen if your data is stolen and what can you do about it?
  - Example activities:
    - Test out various passwords on a site
    - Explore Google's privacy policy: What do they know about you?
- Information Literacy
  - What is information literacy?
  - How can you do effective internet searches?
  - What are some techniques for judging source legitimacy and identifying misinformation?
  - Example activities:
    - Create and test search queries
    - Explore evidence for using sources
- Creative Credit and Copyright
  - What is copyright?
  - What are the different types of copyright licenses
  - Example activities:
    - Create citations for sources
    - Explore image search tools
- Hacking Ethics
  - What are hackers?
  - Are there different kinds of hackers? (white, black, grey)
  - What are bug bounty programs?
  - Is hacking always illegal?
  - What are the consequences of illegal hacking?
  - Example activities:
    - Explore what penetration testing is
    - Sign an ethical hacker agreement
- Final project: Create a Public Service Announcement
  - Create a Public Service Announcement (PSA) to teach your peers about your selected topic in digital citizenship and cyber hygiene. You can select any of the topics covered in this module. Be creative and make it fun! You could make a video, song, poster, or slideshow.

Unit 2: Programming with Karel (7 weeks, 35 hours)
Karel is a dog that only knows how to move, turn left, and place tennis balls in his world. Students can give Karel these commands to instruct him to do certain things. Karel is used to show students what it means to program, and allows them to focus on problem solving.

Browse the full content of this unit at https://codehs.com/library/course/6427/module/9285

Objectives / Topics Covered	- Commands - Defining vs. Calling Methods - Designing methods - Program entry points - Control flow - Looping - Conditionals - Classes - Commenting code - Preconditions and Postconditions - Top Down Design
Assignments / Labs	30 Karel Programming Exercises and Challenges in total - Program-specific tasks for Karel the Dog - Example Exercise: Pyramid of Karel Write a program to have Karel build a pyramid. There should be three balls on the first row, two in the second row, and one in the third row. - Teach Karel new commands like `turnRight()` or `makePancakes()` - Example Exercise: Pancakes Karel is the waiter. He needs to deliver a stack of pancakes to the guests on the 2nd, 4th, and 6th avenue. Each stack of pancakes should have three pancakes. Create a method called `makePancakes()` to help Karel solve this problem. - Solve large Karel problems by breaking them down into smaller, more manageable problems using Top Down Design - Example Exercise: The Two Towers In this program, Karel should build two towers of tennis balls. Each tower should be 3 tennis balls high. At the end, Karel should end up on top of the second tower, facing East. - Using control structures and conditionals to solve general problems - Example Exercise: Random Hurdles Write a program that has Karel run to the other side of first street, jumping over all of the hurdles. However, the hurdles can be in random locations. The world is fourteen avenues long.

Unit 3: Karel Challenges - optional (2 weeks, 10 hours)
In this unit, students take all the foundational concepts from Karel to solve some programming challenges.

Browse the full content of this unit at https://codehs.com/library/course/6427/module/9286

Objectives / Topics Covered	● Solving large and more complex problems using Karel

Assignments / Labs	● Several Karel challenges to tie everything learned in the Karel module together
	   ○ Example Exercise: Super Cleanup Karel
	     Karel's world is a complete mess. There are tennis balls all over the place, and you need to clean them up. Karel will start in the bottom left corner of the world facing east, and should clean up all of the tennis balls in the world. This program should be general enough to work on any size world with tennis balls in any locations.

Unit 4: What is Computing? (2 weeks/10 hours)
This unit addresses the question What is Computing? Students review a history of computing, learn about the various parts that make up modern computers, learn about the impact computing has had on today's world, and learn about the impacts computing could potentially have in the future.

Browse the full content of this unit at https://codehs.com/library/course/6427/module/9301

Objectives / Topics Covered	● History of Computers ● Computer Organization ● Software ● Hardware ● Future of Computing ● Final Project

Example Assignments / Labs	● History of Computers
	   ○ Find out when the first computers were created
	   ○ Research famous computer innovators
	   ○ What roles do computers play in your life?
	   ○ Example Activity:
	     ■ Summarize an era of advances in computers
	● Computer Organization
	   ○ What parts do modern computers have?
	   ○ What are input devices?
	   ○ What are output devices?
	   ○ Example Activity:
	     ■ Draw a computer and label all of its parts, including the input devices and output devices
	● Software/Hardware
	   ○ What's the difference?
	   ○ What hardware components make up a computer?
	   ○ What is software used for?
	   ○ Example Activity:
	     ■ Label the parts of your computer
	● Future of Computing
	   ○ Research uses of Artificial Intelligence in use now
	   ○ Research new ways of storing data
	   ○ Example Class Activity:
	     ■ In what ways can we use technology that we couldn't 10 years ago. Are these technological

advances helpful or harmful overall?
- Final Project
    - Create a presentation about a computer. Choose any computer -- a phone, an early computer model, drones, etc. Who built it and why? How does it interact with people? How do people interact with the computer?

Unit 5: Javascript & Graphics (2 weeks, 10 hours)

This unit Introduces students to the basics of JavaScript, including variables, user input, mathematics, basic graphics, and image representations.

Browse the full content of this unit at https://codehs.com/library/course/6427/module/9288

Objectives / Topics Covered	- Variables - User Input - Arithmetic Expressions - Graphics - Image Representation
Assignments / Labs	- Using variables and getting user input using JavaScript - Example Exercise: Dinner Plans Prompt the user for their name, then ask them what time you should meet for dinner. Greet them by name and tell them you will meet them at the time they specified! - Create basic graphics in JavaScript - Example Exercise: Flag of the Netherlands This program should draw the flag for the Netherlands. The top third of the canvas is red, the middle third is white, and the bottom third is blue, as shown below. You will need to use Rectangle objects in this program.

Unit 6: Graphics Challenges - optional (2 weeks, 10 hours)

In this unit, students learn how to pair program! They will also take all the foundational concepts from JavaScript Graphics to solve some programming challenges.

Browse the full content of this unit at https://codehs.com/library/course/6427/module/9289

Objectives / Topics Covered	- Pair programming - Solving large and more complex problems that incorporate graphics and user input
Assignments / Labs	- Several graphics challenges to tie everything learned in the module together - Example Exercise: Ghost Write a program to draw a ghost on the screen. You must do this by using the constant values given (this will allow us to easily alter the size or color of the ghost.)

Unit 7: Mobile Apps Project (1 week, 10 hours)
With this project, students learn how to make their first real mobile apps and how to test them out on their phones. To run apps on a smartphone phone, students will need to download the Expo app. Find more information about Expo at https://expo.io.

Browse the full content of this unit at https://codehs.com/library/course/6378/module/9184

Objectives / Topics Covered	● Expo ● Mobile Apps ● Touch Screen

Assignments / Labs	● Make a drawing app! The first thing you will need to do is change the code on line 4 to mouseDragMethod(onTap);. This will make it so the function onTap is called when you drag your finger or mouse across the canvas, instead of when you click or tap the screen.
	    ○ - Change the color. For an added challenge, give the user an option to pick which color they would like to use
	    ○ - Change the size of your circle. For a challenge, make the size of the circle change as the user is drawing.
	    ○ - Instead of drawing a circle, draw another shape. You can also layer shapes on top of each other for a cool effect!

Unit 8: Networks and the Internet (3 weeks/15 hours)
This unit explores the structure and design of the internet, and how this design affects the reliability of network communication, the security of data, and personal privacy.

Browse the full content of this unit at https://codehs.com/library/course/6427/module/9287

Objectives / Topics Covered	● Structure of the internet ● How network data is transmitted ● Hardware involved in the transmission of data ● How the internet has impacted everyday life

Example Assignments / Labs	● Structure of the internet
	    ○ Explore the differences between IPv4 and IPv6. Why are we running out of addresses?
	    ○ Explore the different levels of the internet.
	    ○ Example Activity
	        ■ Trace a website request from the server, through the network, and to your computer
	● How data is transmitted
	    ○ How are internet packets able to find their way to your computer?
	    ○ 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?
	    ○ Example Activity:
	        ■ 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.

	● Hardware involved
	    ○ Explore the role of routers
	    ○ Why are protocols so important?
	    ○ Explore how data is able to be transmitted across the ocean by using underwater cables

Unit 9: Web Design (3 weeks/15 hours)

Browse the full content of this unit at https://codehs.com/library/course/6427/module/9302

Objectives / Topics Covered	● Creating webpages using HTML
	    ○ Links
	    ○ Images
	    ○ Lists
	    ○ Tables
	    ○ Inline styling
	● Styling webpages with CSS
	    ○ Creating CSS rules
	    ○ CSS classes
	    ○ CSS IDs
	● How webpages are requested and delivered

Example Assignments / Labs	● Links
	    ○ Learn how to link different pages together
	    ○ Example Exercise: Create a webpage that provides links to your favorite books
	● Images
	    ○ Learn how to add and format images
	    ○ Example Exercise: Create a collage of images
	● Tables
	    ○ Learn how to create and style tables
	    ○ Example Exercise: Create a table describing your favorite music artists and songs
	● Styling with CSS
	    ○ Use CSS to add background colors, font colors, font styles, borders, and position elements on the page
	    ○ Example Exercise: Create CSS classes and IDs to apply formatting to a BINGO board
	    ○ Example Exercise: Create CSS classes to style a music library web page
	    ○ Example Exercise: Create CSS Rules to put a Karel puzzle together
	● Viewing websites
	    ○ How are web pages served to your computer?
	    ○ Where do web pages live?
	● Final Project
	    ○ Build your own homepage using everything you've learned in the module
	    ○ This homepage will serve as your personal portfolio of creative projects as you continue through the course!

Unit 10: Computer Science Careers (< 1 week, < 5 hours)
In this short unit, students take some time to explore and discover different computer science careers. They will also examine inclusive coding and how to avoid bias in computer programming.

Browse the full content of this unit at https://codehs.com/library/course/6427/module/9294

Objectives / Topics Covered	- Computer Science Careers - Computer Science used in non CS Careers - Inclusive Coding
Assignments / Labs	- Career Research - Computer Science concepts that are used in non computer science positions - How can a computer program's bias become dangerous? - Why is it important to have a more diverse group of people in the computer science field?

Unit 11: Final Project (2-4 weeks, 10-20 hours)
This unit introduces students to the theory and practice of user interface design. Students learn about what makes an engaging and accessible user interface, and will employ an iterative design process including rapid prototyping and user testing to design and develop their own engaging program.

Browse the full content of this unit at https://codehs.com/library/course/6427/module/9293

Objectives / Topics Covered	- Project Planning - Final Project Creation
Assignments / Labs	- Program Requirements: - must use JavaScript Graphics to tell a story or give information about an important topic - Look back at the PSA project you completed earlier in the course if you need some inspiration! - must allow the user to interact with your project with their mouse - must use at least one timer - must break down the program into multiple functions - must utilize control structures where applicable - Alternative Storytelling - Linear story - use a timer to switch scenes at a specific interval - utilize a button to switch scenes when the user decides to move on - Choose-your-own-Adventure - the user is given a selection and the story plays out based on the option they choose - Moving Scenes - use a timer to have different parts of your scene move around the screen to add to the user experience