CodeHS

Georgia Foundations of Computer Programming Course Syllabus

Course Overview and Goals

This course is designed for middle school students and will provide an exploratory foundation in computer programming. It is designed to be taught in a 9-week rotation in 45-minute daily classes. Through integrated instructional activities, students will have opportunities to apply employability skills and to research possible career options in the information technology area. They will also complete many hands-on activities to build a strong foundation in computer coding. This course may be taught in 6th, 7th, or 8th grade.

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.

More information: Browse the content of this course at https://codehs.com/course/28990

Prerequisites

The Georgia Foundations of Computer Programming 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

Module 1: Exploring Computing (10 hours)

This module 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/course/28990/module/42797

Objectives / Topics Covered	• History of Computers • How Software Works • Computer Hardware • Cloud Computing • Internet of Things • Ethics and Legal Considerations • Future of Computing • Project: Design the Computer Device of Tomorrow

Example Assignments / Labs	● History of Computing ○ *Jigsaw: Computer Interaction Over the Decades:* In this activity, students are going to work in small groups to research what it was like to interact with computers over the various decades. For each section, students will want to consider what was typical for most computers. For example, GUI interfaces were first used in the 1970s, but they were not typical until the 1980s. ● Future of Computing ○ *Careers with Technology and AI:* Technology and AI (artificial intelligence) are changing how many jobs work, including jobs you might be interested in someday. In this activity, you will explore one career you are curious about and learn how technology and people work together in that job.

Module 2: Exploring Code with Karel (10 hours)

In this project, students will create a short presentation about a specific model of computer. It could be an early computer model, or a computer model that is still being developed. Students will pick any technology where a computer is the main component -- this includes phones, robots, drones, etc.

Browse the full content of this module at https://codehs.com/course/28990/module/42798

Topics Covered	● Syntax ● Syntax Errors ● Comments ● Debugging ● Functions ● For Loops ● Conditional Statements ● If/Else Statements ● While Loops ● Control structures ● Decomposition
Example Assignments	● Karel's Evening Walk ○ Take Karel on a walk around the north side of the pond. Remember the directions Karel can face and write a program to move Karel along the path from one edge of the world to the other. Karel should be facing south at the end of the path. But wait! Karel noticed a missing tennis ball laying on the path. Go ahead and let Karel pick it up along the walk. ● Pick Up Tennis Balls ○ Karel needs help picking up the tennis balls lying around the dog park. Create a program that uses two for-loops and ends with Karel in the lower-right corner facing to the right or east. ● Stay Out of the Lake ○ This program is supposed to train Karel to walk up to a lake at any park, but not to jump in. But right now there is a bug! Help fix the bug so that Karel stops moving when reaching the edge of a lake.

Module 3: Exploring the Internet (10 hours)

Browse the full content of this unit at https://codehs.com/course/28990/module/42799

Objectives / Topics Covered	• What is the Internet? • Need for Protocols • Routing • Impact of the Internet • Network Administration • Cybersecurity • CIA Triad • Encryption • Project: Steganography

Example Assignments / Labs	• Network Simulation
	  ○ In this simulation, there are six devices in a network. Click the green RUN button to start the simulation. Clicking on a device will prepare it to send a message. Clicking on a second device will send the message to that device.
	• Internet in My Daily Life
	  ○ Envision a normal day, from the time you wake up to the time you go to sleep. In what ways do you use the Internet during your day? For what purposes do you use the Internet? As you go through a normal day in your mind, write down all the ways you use the Internet. Include the device you use and the purpose.
	• Cybersecurity
	  ○ Students will learn what is meant by *cybersecurity* and explore a few news worthy cyber attacks. They will also discuss the *Internet of Things* and the increase in connected devices.
	• Project: Steganography
	  ○ In the following activity, you will see a picture and the corresponding color codes associated with the pixels. There is a message hidden in the first 12 pixels! Below is the method used to hide the message. Your mission will be to reverse the process and find the secret message!

Module 4: Project: Troubleshooting (2 hours)

In this project, students will explore the troubleshooting methodology and utilize it to solve sample IT support issues.

Browse the full content of this unit at https://codehs.com/course/28990/module/42801

Objectives / Topics Covered	• Troubleshooting Methodology
	  ○ Identify the problem
	  ○ Research past solutions
	  ○ Establish a theory
	  ○ Test the theory
	  ○ Establish a plan of action
	  ○ Implement the solution
	  ○ Verify functionality
	  ○ Document findings

Example Assignments / Labs	● Troubleshooting: In this project, students will learn more about each step of the troubleshooting methodology and use these steps to repair and improve faulty network systems. ○ Poor Signal Strength ○ Interference

Module 5: Exploring Digital Citizenship (10 hours)

Students will get to combine the skills they have learned to paint a digital image using Tracy the Turtle! They will learn about and use pair-programming throughout this project.

Browse the full content of this unit at https://codehs.com/course/28990/module/42800

Objectives / Topics Covered	● Digital Footprint ● Cyberbullying ● Internet Safety ● Privacy & Security ● Information Literacy ● Creative Credit & Copyright ● Hacking Ethics ● Project: Public Service Announcement
Example Assignments / Labs	● Digital Footprint and Reputation ○ *Building a Positive Digital Footprint:* Spend some time reflecting on you and your friends' social media activity. Give an example of a social media post that builds a positive digital footprint. How does the post build a positive digital footprint? Give an example of a social media post that builds a negative digital footprint. How does the post build a negative digital footprint? Thinking about your digital footprint, are you going to make any changes in what you post on social media? How about what you write to share in a group message? Why or why not? ● Internet Safety ○ *Scenario: School Stranger:* You begin to receive direct messages on Instagram from a person you don't recognize. They claim to go to your school, and they know a lot of information about your classes and teachers. They also follow a lot of your classmates, so you believe them. After a bit, they start asking questions about you and your friends. What steps should you take to respond to this situation? ● Information Literacy ○ *Evaluate the Source 1:* Take a look at this resource, and consider the following questions: What evidence do you see that this source is credible? What evidence do you see that makes you question the source's credibility? Is this a credible source?