



## 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. Students who successfully complete this course will be prepared for the following pathways upon entering high school: Internet of Things, Programming, and Computer Science. 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.

**Programming Environment:** For the programming units, students write and run Python programs in the browser using the CodeHS 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/7415>

### 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.

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### Course Breakdown

#### **Module 1: What is 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/library/course/7415/module/10845>

Objectives / Topics Covered	<ul style="list-style-type: none"><li>• History of Computers</li><li>• Computer Organization</li><li>• Software</li></ul>
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	<ul style="list-style-type: none"> <li>• Hardware</li> <li>• Future of Computing</li> <li>• Final Project</li> </ul>
Example Assignments / Labs	<ul style="list-style-type: none"> <li>• History of Computers <ul style="list-style-type: none"> <li>○ Find out when the first computers were created</li> <li>○ Research famous computer innovators</li> <li>○ What roles do computers play in your life?</li> <li>○ Example Activity: <ul style="list-style-type: none"> <li>■ Summarize an era of advances in computers</li> </ul> </li> </ul> </li> <li>• Computer Organization <ul style="list-style-type: none"> <li>○ What parts do modern computers have?</li> <li>○ What are input devices?</li> <li>○ What are output devices?</li> <li>○ Example Activity: <ul style="list-style-type: none"> <li>■ Draw a computer and label all of its parts, including the input devices and output devices</li> </ul> </li> </ul> </li> <li>• Software/Hardware <ul style="list-style-type: none"> <li>○ What's the difference?</li> <li>○ What hardware components make up a computer?</li> <li>○ What is software used for?</li> <li>○ Example Activity: <ul style="list-style-type: none"> <li>■ Label the parts of your computer</li> </ul> </li> </ul> </li> <li>• Future of Computing <ul style="list-style-type: none"> <li>○ Research uses of Artificial Intelligence in use now</li> <li>○ Research new ways of storing data</li> <li>○ Example Class Activity: <ul style="list-style-type: none"> <li>■ In what ways can we use technology that we couldn't 10 years ago. Are these technological advances helpful or harmful overall?</li> </ul> </li> </ul> </li> <li>• Final Project <ul style="list-style-type: none"> <li>○ 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?</li> </ul> </li> </ul>

### **Module 2: Project: Computer Models (5 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/library/course/7415/module/11611>

### **Module 3: Programming with Turtle Graphics (20 hours)**

Browse the full content of this unit at <https://codehs.com/library/course/7415/module/10846>

Objectives / Topics Covered	<ul style="list-style-type: none"> <li>• What is a Command?</li> <li>• Moving Tracy</li> <li>• Tracy's Coordinate System</li> <li>• For Loops</li> </ul>
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	<ul style="list-style-type: none"> <li>• Functions and Parameters</li> <li>• Top Down Design</li> <li>• Variables</li> <li>• User Input</li> <li>• If/else Statements</li> <li>• While Loops</li> </ul>
Example Assignments / Labs	<ul style="list-style-type: none"> <li>• 34 exercises total</li> <li>• Example exercises: <ul style="list-style-type: none"> <li>◦ Row of Circles <ul style="list-style-type: none"> <li>▪ In this program, Tracy should draw a row of circles across the width of the canvas using a for loop.</li> </ul> </li> <li>◦ Circle Pyramid <ul style="list-style-type: none"> <li>▪ Write a program that directs Tracy to draw a pyramid with 3 circles on the bottom row, 2 in the middle, and 1 on top.</li> </ul> </li> <li>◦ Bubble Wrap 2.0 <ul style="list-style-type: none"> <li>▪ In this program, you should have Tracy add highlights to each bubble from our Bubble Wrap example program. Use top down design to break this large problem into smaller pieces!</li> </ul> </li> <li>◦ Rating <ul style="list-style-type: none"> <li>▪ Write a program that shows a graphical representation of a user's rating value. If the value is between 1 and 4, draw a red X. If it is between 5 and 7, draw a yellow horizontal line. If it is an 8 or above, draw a green checkmark.</li> </ul> </li> </ul> </li> </ul>

#### **Module 4: Project: Pair-Programming Paint (5 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/library/course/7415/module/10852>