

South Carolina Introduction to Computer Programming Syllabus

High School (120 Contact Hours)

Course Overview and Goals

The South Carolina Introduction to Computer Programming course is designed to emphasize the fundamentals of computer programming using Python. Topics include computer software, program design and development, and practical experience in programming. This course is fully aligned with the South Carolina Introduction to Computer Programming CTE course.

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 are made up of short video tutorials, example programs, quizzes, simulations, programming exercises, and free-response prompts. Each unit ends with a comprehensive unit quiz that assesses students' mastery of that unit's material.

Programming Environment

Students write and run programs in the browser using the CodeHS editor. The first programming module is in Python and utilizes Karel the Dog to teach basic programming concepts. The programming modules that follow continue working with Python in the console and cover conditionals, loops, and functions.

More Information

Browse the content of this course at <https://codehs.com/course/23682/explore>

Prerequisites

The South Carolina Introduction to 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 those new to computer science.

Course Breakdown

Module 1: Digital Citizenship and Cyber Hygiene (2 weeks/10 hours)

In this module, students learn about Internet etiquette and how to stay safe online. Students will also look at the potential effects of our digital footprints, how to protect information from online risks, and the implications of cyberbullying. The module also includes how to find and cite quality resources online.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32558>

Topics Covered	<ul style="list-style-type: none"> ● Digital Footprint and Reputation ● Cyberbullying ● Internet Safety ● Privacy and Security ● Information Literacy ● Cyber Ethics and Laws
Example Assignments	<ul style="list-style-type: none"> ● Digital Footprint and Responsibility <ul style="list-style-type: none"> ○ Students explore the impact of social media and technology on teenagers, covering topics like digital footprints, the rise of social media screenings, cyberbullying, and the importance of updating privacy settings. ● Cyberbullying <ul style="list-style-type: none"> ○ 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: <ul style="list-style-type: none"> ■ Explore cyberbullying scenarios: What would you do? ● Internet Safety <ul style="list-style-type: none"> ○ What are some ways to stay safe online? ○ What are some online safety guidelines? ○ Example activities: <ul style="list-style-type: none"> ■ Explore Internet safety scenarios: What would you do? ● Privacy and Security <ul style="list-style-type: none"> ○ What are data privacy and security? ○ How can you keep personal data secure and private? ○ Example activities: <ul style="list-style-type: none"> ■ Test out various passwords on a site ■ Explore Google’s privacy policy: What do they know about you? ● Information Literacy <ul style="list-style-type: none"> ○ What is information literacy? ○ How can you do effective internet searches? ○ What are some techniques for judging source legitimacy and identifying misinformation? ○ Example activities: <ul style="list-style-type: none"> ■ Create and test search queries ■ Explore the evidence for using sources ● Cyber Ethics and Laws <ul style="list-style-type: none"> ○ This lesson navigates through cyber ethics, differentiating between ethics and laws, exploring legal consequences, copyright in education, the process of obtaining permissions, and the pros and cons of intellectual property laws.

Module 2: What is Computing? (1.5 weeks/8 hours)

In this module, students will compare and contrast common operating systems (Windows, Linux, OS) and explain the importance of application security. They will investigate security options and implement user accounts to

enforce authentication and authorization. Students will also demonstrate how to work with basic and advanced command prompts.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32552>

Topics Covered	<ul style="list-style-type: none"> ● Internal Components of a Computer ● Peripheral Devices ● Storage Options ● Software and Applications ● Global Impact of Computing Innovations
Example Assignments	<ul style="list-style-type: none"> ● Different Types of CPU ● RAM vs. Hard Drive ● Input/Output and Peripheral Devices ● Security of Cloud Storage ● Software and Applications ● Project: The Impact of Computing Solutions in Developing Countries <ul style="list-style-type: none"> ○ In this project, students research the impact of a computing solution to a problem in developing countries. They use their research to create a digital artifact and answer a series of prompts related to the social, economic, and cultural impact of the solution.

Module 3: Karel in Python (3 weeks/15 hours)

In this module, students learn the basics of programming by giving Karel the Dog commands in a grid world.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32486>

Topics Covered	<ul style="list-style-type: none"> ● Commands ● Defining vs. Calling Functions ● Designing Functions ● Control Flow ● Looping ● Conditionals ● Commenting Code ● Top Down Design
Example Assignments	<ul style="list-style-type: none"> ● Program-specific tasks for Karel the Dog <ul style="list-style-type: none"> ○ 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 <code>turnRight()</code> or <code>makePancakes()</code> <ul style="list-style-type: none"> ○ Example Exercise: Pancakes Karel is the waiter. He needs to deliver a stack of pancakes to the guests on the 2nd, 4th, and 6th columns. Each stack of pancakes should have three pancakes. Create a function called <code>makePancakes()</code> to help Karel solve this problem. The world should end up exactly as shown here. ● Solve large Karel problems by breaking them down into smaller, more manageable problems using Top Down Design <ul style="list-style-type: none"> ○ Example Exercise: The Two Towers In this program, Karel should build two towers of tennis balls. Each

	<p>tower should be 3 tennis balls high. In the end, Karel should end up on top of the second tower, facing East.</p> <ul style="list-style-type: none"> ● Using control structures and conditionals to solve general problems <ul style="list-style-type: none"> ○ Example Exercise: Random Hurdles <p>Write a program that has Karel run to the other side of the first row, jumping over all of the hurdles. Karel should only jump if there is a hurdle blocking the way. However, the hurdles can be in random locations. The world is fourteen columns long. You must write a function named <code>jumpHurdle()</code> as part of your solution.</p>
--	--

Module 4: Basic Python and Console Interaction (3 weeks/15 hours)

In this module, students learn the basics of programming by writing programs that interact with users through the keyboard.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32487>

Topics Covered	<ul style="list-style-type: none"> ● Printing ● Variables ● Types ● User Input ● Converting Input Types ● Arithmetic Expressions ● String Operators ● Comments
Example Assignments	<ul style="list-style-type: none"> ● Printing <ul style="list-style-type: none"> ○ Print messages to the console ● Variables <ul style="list-style-type: none"> ○ Create variables of different types, and print them to the console. ● Types <ul style="list-style-type: none"> ○ Investigate the types of different variables ○ Convert between types ● Arithmetic Expressions & Converting Input Types <ul style="list-style-type: none"> ○ Age in One Year - Ask the user how old they are, and tell them how old they will be in one year ○ Rectangle, part 1 - Make variables for length and width and compute area and perimeter ○ Rectangle, part 2 - Ask the user for length and width and compute area and perimeter

Module 5: Project: Mad Libs (2 days/2 hours)

In this project, students write a program that allows users to create their own Mad Lib stories using variables and user input.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32488>

Topics Covered	<ul style="list-style-type: none"> ● Variables ● User Input ● Print Statements
Example Assignments	<ul style="list-style-type: none"> ● Create a Mad Libs game where users can input different types of words to complete a story. The program should prompt the user for various types of

	words (e.g., noun, adjective, verb) and then construct a story using the provided words.
--	--

Module 6: Conditionals (2 weeks/10 hours)

In this module, students teach their programs to make decisions based on the information it receives.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32489>

Topics Covered	<ul style="list-style-type: none"> ● If Statements ● Boolean Values ● Logical Operators ● Comparison Operators ● Floating Point Numbers and “Equality”
Example Assignments	<ul style="list-style-type: none"> ● If statements and boolean values <ul style="list-style-type: none"> ○ Is it raining? - Write a program that uses a boolean variable to determine whether or not it is raining ● Boolean operators, and expressions <ul style="list-style-type: none"> ○ Boolean variable - Take a variable and use it in an if statement ○ Legally allowed to vote - User reports age and the program tells them whether or not they can vote in the US ○ Transaction - The user reports balance and deposit/withdrawal, and the program prints a new balance or error ○ Recipe - Ask the user for ingredients, amounts per serving, and number of servings, and report the total amount of each ingredient needed

Module 7: Looping (2 weeks/10 hours)

In this module, students learn how to write more efficient code by using loops as shortcuts.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32491>

Topics Covered	<ul style="list-style-type: none"> ● While Loops ● For Loops ● Break and Continue ● Nested Control Structures
Example Assignments	<ul style="list-style-type: none"> ● While Loops <ul style="list-style-type: none"> ○ Divisibility - Ask the user to enter a numerator and denominator, and re-prompt until the denominator is non-zero ● For Loops <ul style="list-style-type: none"> ○ Average test score - Compute the average of several test scores ● Break and Continue <ul style="list-style-type: none"> ○ Higher/ Lower - Ask the user to guess a particular number between 1 and 100. If the user’s guess was too high or too low, they should be notified ● Nested Control Structures <ul style="list-style-type: none"> ○ Rolling Dice - Print out all combinations that can be made when 2 dice are rolled

Module 8: Functions and Exceptions (2 weeks/10 hours)

In this module, students learn how to decompose problems into smaller pieces that work together to solve a problem.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32493>

Topics Covered	<ul style="list-style-type: none"> ● Functions ● Namespaces ● Parameters ● Return Values ● Exceptions
Example Assignments	<ul style="list-style-type: none"> ● Functions <ul style="list-style-type: none"> ○ Raining cats and dogs - Write functions to print text art of a cat and a dog ○ Temperature converter - write functions to convert from Fahrenheit to Celsius and vice versa ● Exceptions <ul style="list-style-type: none"> ○ Temperature converter, part 2 - Add exception handling to your temperature conversion program ● Putting it all together <ul style="list-style-type: none"> ○ Enter a positive number - Make a function to repeatedly ask the user to enter a number until they enter a positive number

Module 9: Creative Development (3 weeks/15 hours)

In this module, students will learn the theory and practice of user interface design. They will create a program that will quiz users on a series of multiple-choice questions and check their answers. This project allows students to think creatively about the applications of the concepts covered in the course, and create something of personal value.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32570>

Topics Covered	<ul style="list-style-type: none"> ● Design Thinking ● Prototyping ● Testing ● Project Prep and Development
Example Assignments	<ul style="list-style-type: none"> ● Development Process <ul style="list-style-type: none"> ○ How to Make Accessible Programs ○ Iterative Development ○ User Research <ul style="list-style-type: none"> ■ Diverse Perspectives ○ Online Collaboration Tools ● User Testing <ul style="list-style-type: none"> ○ Wizard of Oz Prototyping ○ How to User Test Responses

Module 10: Exploring Data Science with Sheets (2 weeks/10 hours)

In this module, students will learn about the role of a data scientist and the iterative steps in the data science life cycle. They will learn and apply the process of the data science life cycle. This includes asking statistical questions, collecting or obtaining reliable data, analyzing the data, and summarizing the results.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32573>

<p>Topics Covered</p>	<ul style="list-style-type: none"> ● What is Data Science? ● The Data Science Life Cycle ● Spreadsheet Basics ● Data Cleaning ● Sorting and Filtering Data ● Data Visualizations ● Pivot Tables ● Mean, Median, Mode
<p>Example Assignments</p>	<ul style="list-style-type: none"> ● What Does a Data Scientist Do? <ul style="list-style-type: none"> ○ Explore the day-to-day operations of professional data scientists. ● Exploring Data <ul style="list-style-type: none"> ○ View different data visualizations to get a feel for the power of data. ● Lookup, Compute, Relate <ul style="list-style-type: none"> ○ Learn about the different types of questions that can be used in data. ● What Stage? <ul style="list-style-type: none"> ○ Determine what stage in the Data Science Life Cycle the scenarios are in. ● Develop a Statistical Question ● Basic Operations Exploration <ul style="list-style-type: none"> ○ Explore rows and columns, ranges, formulas, comparison operators, text and number data types, currency and dates, and logic values. ● Data Cleaning <ul style="list-style-type: none"> ○ Address issues in data such as missing values, irrelevant data, formatting issues, and duplicate data. ● Influential Women <ul style="list-style-type: none"> ○ Practice sorting data and creating filters while learning about influential women. ● Which Visualization is Best? <ul style="list-style-type: none"> ○ Explore the variety of visualizations that exist in Google Sheets. ○ Compare different visualizations for the same dataset to determine which visualizations work best for specific data. ● Sneaker Boutique Sales <ul style="list-style-type: none"> ○ Help identify items that generate the most revenue for a company by creating pivot tables ● Unemployment Rates <ul style="list-style-type: none"> ○ Discover the average unemployment rate in the U.S.

Module 11: The 21st Century Workplace (1 week/5 hours)

In this module, students learn basic safety inside the classroom and how this applies to the workplace. They also explore future career options and the skills needed to obtain these jobs.

Browse the full content of this module at <https://codehs.com/course/23682/explore/module/32547>

<p>Topics Covered</p>	<ul style="list-style-type: none"> ● School and Classroom Safety ● Workplace Safety ● Skills for the 21st Century ● Computer Science Careers
-----------------------	--

Example Assignments	<ul style="list-style-type: none">● Students explore the workplace and the skills needed to succeed in computer science careers● Example exercises:<ul style="list-style-type: none">○ One Page Project on workplace safety○ Review 21st Century workplace skills and reflect on using them in the classroom○ Explore computer science careers and how computer science is used in other fields
---------------------	--