PCEP Certification Prep Syllabus

High School - One Semester (70 hours)

Course Overview and Goals

This course helps prepare students for the Python Institute's PCEP Certification by providing a structured progression of lessons, exercises, and assessments that cover all exam objectives. With built-in practice and review, it equips teachers with a ready-to-use curriculum to guide students toward earning an industry-recognized Python credential.

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, adding up to over 100 hours of hands-on programming practice in total. Several units end with a comprehensive unit test that assesses students' mastery of the material from that unit as well as challenge problems where students can display their understanding of the material.

Development Environment

Students write and run Python programs in the browser using the CodeHS editor.

Prerequisites

There are no official prerequisites for the CodeHS PCEP Certification Prep course. The course is designed for beginner students with no previous background in computer science.

Technology Requirements

To complete all activities and exercises in this course, students must have access to the 3rd party sites and tools listed here: PCEP Certification Prep Course Links

More Information

Browse the content of this course at https://codehs.com/course/26697/explore

Course Breakdown

Module 1: Basic Python and Console Interaction (3 weeks/15 hours)

Students learn the basics of programming by writing programs that interact with users through the keyboard.
Browse the full content of this unit at https://codehs.com/course/26697/explore/module/38061

Topics Covered	• Printing • Variables • Types • User Input • Converting Input Types

	• Arithmetic Expressions • String Operators • Comments • Fundamental Terms and Definitions

Example Assignments	• Printing
	  ○ Print messages to the console
	• Variables
	  ○ Create variables of different types, and print them to the console.
	• Types
	  ○ Investigate the types of different variables
	  ○ Convert between types
	• Arithmetic Expressions & Converting Input Types
	  ○ 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 2: Conditionals (2 weeks/10 hours)

Students teach their programs to make decisions based on the information it receives.
Browse the full content of this unit at https://codehs.com/course/26697/explore/module/38062

Objectives / Topics Covered	• If Statements • Boolean Values • Logical Operators • Comparison Operators • Floating Point Numbers and “Equality”

Example Assignments / Labs	• If statements and boolean values
	  ○ Is it raining? - Write a program that uses a boolean variable to determine whether or not it is raining
	• Boolean operators, and expressions
	  ○ 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 3: Looping (2 weeks/10 hours)

Students learn how to write more efficient code by using loops as shortcuts.
Browse the full content of this unit at https://codehs.com/course/26697/explore/module/38063

Objectives / Topics Covered	• While Loops • For Loops • Break and Continue • Nested Control Structures

	• While • Else Clauses • Pass Keyword

Example Assignments / Labs	• While Loops
	  ○ Divisibility - Ask the user to enter a numerator and denominator, and re-prompt until the denominator is non-zero
	• For Loops
	  ○ Average test score - Compute the average of several test scores
	• Break and Continue
	  ○ 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
	  ○ Rolling Dice - Print out all combinations that can be made when 2 dice are rolled

Module 4: Functions and Exceptions (2 weeks/10 hours)

Students learn how to decompose problems into smaller pieces that work together to solve a problem.
Browse the full content of this unit at https://codehs.com/course/26697/explore/module/38064

Objectives / Topics Covered	• Functions • Namespaces • Parameters • Return Values • Exceptions • Exception Hierarchy • Exception Delegation and Propagation • Recursion • Global Keyword • Shadowing

Example Assignments / Labs	• Example exercises:
	  ○ Functions
	  ■ 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
	  ■ Temperature converter, part 2 - Add exception handling to your temperature conversion program
	  ○ Putting it all together
	  ■ Enter a positive number - Make a function to repeatedly ask the user to enter a number until they enter a positive number

Module 5: Strings (1-2 weeks/5-8 hours)

Students learn more sophisticated strategies for manipulating text in their programs.
Browse the full content of this unit at https://codehs.com/course/26697/explore/module/38066

Objectives / Topics Covered	• Indexing and Slicing • Math Operators on Strings

	• For Loops Over a String • String Methods

Example Assignments / Labs	• Example exercises:
	  ○ Indexing
	  ■ First character - write a function that takes a string and returns the first character
	  ■ All but the first character - write a function that takes a string and returns everything but the first character
	  ○ Math operators and strings
	  ■ Full name - write a function that takes two strings (a first name and a last name) and returns a full name as a single string
	  ■ Replace a letter - write a function that takes a string and returns a copy with the character at a particular index replaced with a dash
	  ○ For loops on strings
	  ■ Count occurrences - write a function that takes two strings and returns the number of times the second string appears in the first string
	  ○ String methods
	  ■ Add enthusiasm - write a function that takes a string and returns that string in all upper case
	  ■ Remove all from string - write a function that takes two strings and returns a string that consists of the first string with all instances of the second string removed

Module 6: Creating and Altering Data Structures (2 weeks/10 hours)

Students learn how tuples and lists are formed and the various methods that can alter them.
Browse the full content of this unit at https://codehs.com/course/26697/explore/module/38067

Objectives / Topics Covered	• Tuples • Lists • For Loops and Lists • List Methods

Example Assignments / Labs	• Example exercises:
	  ○ Tuples
	  ■ Cookout Orders - Given a tuple of food orders, add up the number of burgers and hotdogs and print the total sums.
	  ○ Lists
	  ■ Listed Greeting - Ask a user to enter their name, age, and favorite sport, then split their response into list elements and use index values to greet them by name and respond that you enjoy that sport as well!
	  ■ Exclamat!on Po!nts - Ask the user for a string and then print the same string with every lowercase i replaced with an exclamation point.
	  ■ Librarian - Ask the user for the last names of the authors of the five books they are returning. Print a list of those names in sorted order.

Module 7: Extending Data Structures (2 weeks/10 hours)

Students learn to build more complex programs that make use of grids and dictionaries.

Browse the full content of this unit at https://codehs.com/course/26697/explore/module/38068

Objectives / Topics Covered	● Dictionaries ● 2d and 3d lists ● List comprehensions ● Packing and unpacking ● Mutable vs. immutable
Example Assignments / Labs	● Example exercises: ○ Dictionaries ■ Phone book - user repeatedly enters their name, and the program either asks for the person's phone number or reports the phone number already provided ○ 2d lists ■ Checkerboard - write a program that prints the initial setup of a checkerboard, with a 1 where a piece would be and a 0 where a blank square would be

Module 8: Review Problems

Students practice answering questions for the PCEP Certification Exam.

Browse the full content of this unit at https://codehs.com/course/26697/explore/module/38132

Objectives / Topics Covered	● Programming and Python Fundamentals ● Control Flow ● Data Collections ● Functions and Exceptions