Tracy en Español Syllabus

Middle School (30 Contact Hours)

Course Overview and Goals

The CodeHS Introduction to Python with Tracy the Turtle en Español course teaches students the basics of programming in the Python language. Tracy is a turtle that can be instructed with the use of various commands to draw scenes on a canvas. Students will learn Python commands, functions, and control structures by solving puzzles and writing creative programs for Tracy to follow. This course is a direct translation of the English version.

Learning Environment

The course utilizes a blended classroom approach. The content is a mix of web-based and physical activities. Students will write and run code in the browser and engage in in-person collaborative exercises with classmates. Teachers utilize tools and resources provided by CodeHS to leverage time in the classroom and give focused 1-on-1 attention to students.

Programming Environment

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

More Information

Browse the content of this course at https://codehs.com/course/18151

Prerequisites

The Introduction to Python with Tracy the Turtle en Español course is designed for complete beginners with no previous background in computer science or as a secondary introductory course that explores a new language, after our Introduction to Computer Science in JavaScript course. The course is highly visual, dynamic, and interactive, making it engaging for those new to computer science.

Course Breakdown

Module 1: El Mundo de Tracy / Tracy's World (2 hours)

Objectives / Topics Covered	• What is a command? • How do we communicate with computers? • Moving Tracy • Drawing circles • Tracy's coordinate system

Assignments / Labs	• 3 exercises total
	• Commands
	  ○ Drawing simple graphics
	  ○ Example Exercise: Oruga (caterpillar)
	  Combine multiple commands to write a program that has Tracy draw 5 circles in a row

Module 2: Moviendo a Tracy Eficientemente / Moving Tracy Efficiently (4 hours)

Objectives / Topics Covered	• Turning Tracy at right angles • For Loops • Using coordinates and angles to move Tracy's position

Assignments / Labs	• 7 exercises total
	• Turning Tracy at right angles
	  ○ Learn how to use the left and right commands to let Tracy explore more of her world
	  ○ Example Exercise: 4 Columnas (4 Columns)
	  Write a program that will have Tracy split her world into 4 columns by drawing 3 vertical lines 100 pixels apart
	• For Loops
	  ○ For loops execute the code inside the loop a set number of times.
	  ○ Example Exercise: Fila de Círculos (Row of Circles)
	  In this program, Tracy should draw a row of circles across the width of the canvas using a for loop.
	• Using coordinates and angles to move Tracy's position
	  ○ Any angle can be used to have Tracy draw shapes with diagonal lines.
	  ○ Example Exercise: Hexágono (Hexagon)
	  Write a program, using for loops, that has Tracy draw a hexagon on the canvas.
	  ○ Tracy can be moved directly to a position on the canvas using coordinate points.
	  ○ Example Exercise: Pirámide Circular (Circle Pyramid)
	  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.

Module 3: Diseñando y Comunicando Soluciones / Designing and Communicating Solutions (6 hours)

Objectives / Topics Covered	• Commenting your code • Naming rules in Python • Functions • Artistic commands • Top Down Design

Assignments / Labs	• 8 exercises total
	• Commenting Your Code
	  ○ Commenting is important to make sure your code is understandable to yourself and others.
	  ■ Example Exercise: Pirámide Circular con Comentarios (Circle Pyramid with Comments)
	  Take your Circle Pyramid program from earlier and add comments to explain what your program is doing.
	• Functions
	  ○ Teach Tracy new commands by grouping a set of commands that can be called with one line of code.
	  ○ Example Exercise: Pila de Formas (Shape Stack)
	  Give Tracy instructions to draw a tower of squares and circles from the bottom to the top of the canvas.
	• Artistic Commands

Module 4: Controlando a Tracy con Variables / Controlling Tracy with Variables (7 hours)

Objectives / Topics Covered	• Variables • User input • Parameters • The value of i in for loops

Assignments / Labs	• 10 exercises total
	• Variables
	  ○ Variables are used to store and manipulate values in our programs.
	  ○ Example Exercise: Tablero de Dardos (Dart Board)
	  Write a program that uses variables to draw a dart board that consists of 4 concentric circles that each increase in radius by 25 pixels.
	• User Input
	  ○ We can use input from a user to control certain commands in our code and make our programs more personalized.
	  ○ Example Exercise: Cuatro Esquinas (Four Corners)
	  User input will dictate the length of the sides of a square. Squares of the indicated size will be drawn in each corner of the canvas.
	• Parameters
	  ○ Parameters can be used to customize functions to make them more reusable.
	  ○ Example Exercise: Oruga de Colores (Colorful Caterpillar)
	  Use parameters to draw a caterpillar with 8 body circles of 4 different colors.
	• The Value of i in For Loops
	  ○ The value of i in a for loop is actually a variable! It can be altered and used to control commands in our code.
	  ○ Example Exercise: Tablero de Dardos Usando i (Dart Board Using i)
	  Alter your previous Dart Board program to use the value of i to control the circle's radius instead of a separate variable.

Module 5: Tomando Decisiones / Making Decisions (5 hours)

Objectives / Topics Covered	• If statements • If/else statements • While loops

Assignments / Labs	• 6 exercises total
	• If statements
	  ○ If statements will execute code only if certain conditions are met
	  ○ Example Exercise: Cara Feliz (Happy Face)
	  Write a program that will draw a happy face on the screen if the user answers that they are happy.
	• If/Else statements
	  ○ The if/else statement executes a block of code if a specified condition is true. If the condition is false, another block of code can be executed.
	  ○ Example Exercise: Clasificación (Rating)
	  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. ● While Loops ○ A while loop allows code to be executed repeatedly based on a given Boolean condition. ○ Example Exercise: Cuadrados Crecientes (Increasing Squares) Write a program that has Tracy draw concentric squares form the center of the canvas until the length variable reaches 400 pixels.

Module 6: Desafios de Tracy / Tracy Challenges (6 hours)

Objectives / Topics Covered	● Control Structures ● Commands ● Defining versus Calling Functions ● Control flow ● Looping ● Conditionals ● Commenting code ● Top Down Design
Assignments / Labs	● Challenges ○ Students use all of the skills learned in the course to solve complex puzzles and challenges. ○ Example Exercise: Adivina un Número (Guess a Number 2.0) Write a program that allows the user to guess a secret number. If their number is too high, draw a down arrow. If their number is too low, draw an up arrow. If they guess the number, draw a checkmark and end the program.

Supplemental Material

Supplementary Units	**Prerequisite/Recommended Unit(s)**	**# of activities**
Desafios Suplementarios (Supplemental Challenges)	All modules in the course are complete.	4
Categorizing Triangles	All modules in the course are complete.	6
Additional Topics	All modules in the course are complete; students should have some basic knowledge of geometry	13