

CS101: Coding in Python 1

Course Description

This course provides an introduction to coding in Python. Students master basic coding concepts common to all programming languages, such as statements, conditionals, and loops, and are additionally introduced to: libraries, procedural graphics, and complex input. Student develop coding-related skills such as decomposition of large programs, debugging, and analyzing code written by others. Students completing this course will be able to create games, animations, and other interactive programs in Python.

Units of Instruction

UNIT 1 - DATA

- Lesson 1: Statements & Variables
- Lesson 2: Values
- Unit 1 Quiz
- Lesson 3: Expressions
- Unit 1 Test

UNIT 2 - DECISIONS

- Lesson 1: Conditionals (If)
- Lesson 2: Conditionals (Else)
- Lesson 3: Booleans
- Unit 2 Quiz
- Lesson 4: While Loops
- Lesson 5: Randomness & Libraries
- Lesson 6: Debugging
- Lesson 7: Program Analysis
- Unit 2 Project: E-Lemonade
- Unit 2 Test

UNIT 3 - DRAWING

- Lesson 1: Lines
- Lesson 2: Shapes & Colors
- Lesson 3: Animation
- Unit 3 Quiz
- Lesson 4: Program Structure
- Lesson 5: Mouse & Keyboard
- Lesson 6: Time
- Unit 3 Project: Critter Catcher
- Unit 3 Test

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Learning Standards

UNIT 1 - DATA

- Students can write simple linear programs that run from top to bottom
- Students recognize values from various data types can use the types that are appropriate for a given application

UNIT 2 - DECISIONS

- Students can write non-linear programs that skip code with conditionals and return to previous code with loops
- Students can access code outside their program using libraries
- Students can deconstruct code in order to list features, debug, and analyze the program structure

UNIT 3 - DRAWING

- Students can create procedural drawing and animation programs using shapes and colors
- Students can use coordinates to place and move elements on screen
- Students can use mouse and keyboard input in their programs
- Students can track and standardize time in their programs

Student Outcomes

UNIT 1 - DATA

- Understand the basic building blocks of code
- Code programs with basic console and input and output
- Think critically about what programming is and why it's useful
- Manipulate and convert between data types
- Perform basic math calculations within a program
- Debug programs
- Analyze and build upon code written by others

UNIT 2 - DECISIONS

- Make conditional decisions within their programs
- Perform logic-based calculations
- Repeat code using loops
- Import outside code into a program
- Use random values in programs
- Understand different types of bugs and approaches to solving them
- Analyze a product and break it down into digestible units

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UNIT 3 - DRAWING

- Open a graphical window for a program
- Position a drawn shape based on coordinate points
- Animate by repeatedly re-drawing images with slight changes
- Organize code in ways that are sensible and readable
- Get complex input from the mouse and keyboard
- Measure and standardize time within a program

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Major Assessments and Assignments

UNIT 1- DATA

- Data Quiz
- Data Test

UNIT 2 - DECISIONS

- Decisions Quiz
- Decisions Test
- Project: E-Lemonade

UNIT 3 - DRAWING

- Drawing Quiz
- Drawing Test
- Project: Critter Catcher

In addition, each lesson has a formative assessment called a lesson check.