

Computer Programming Summer Interest Group

⌚ Course Goal:

By the end of this course, students will understand Python fundamentals and be able to write small programs to solve real-world problems.

⌚ Class Meetings:

Each session will meet on Wednesday evenings from 7:00-8:00 PM ET on the dates listed below.

⌚ Needed Resources:

Each person should bring a laptop computer with Wi-Fi capabilities. I will have instructions for both Windows 11 and MacOS where necessary. Disclaimer: I don't have a MacOS computer so the instructions for that may not be accurate.

I will provide slides and handouts for each session.

⌚ Approach:

Each session will have a short devotional followed by 20-30 minutes of instruction.

The remainder of each session will be an opportunity for students to work together to put into practice the concepts described in the instructional portion of the session.

Working together in small groups of 2-3 people is highly encouraged. The intent is for each group to have a mix of experience levels and to learn not only from the instructions presented at the start of the session, but from each other.

⌚ Group Projects:

We will also have the opportunity for anyone interested to work on a group project. This project may continue beyond the end of the summer interest group session. I am willing to support / advise / participate in group projects as appropriate.

The details of the project will be up to each team, but it should have a well-defined end state.

Participation in a group project is voluntary, but if you decide to join a group project, you should remain committed to continuing with the project to its conclusion.

If there is enough interest in group projects, I will provide additional information and guidance.

Session 1 – 6/4/25: Getting Started with Python

Topics:

- What is Python?
- Install Python
- Install VS Code
- Running your first program: `print("Hello, world!")`
- Introduction to code editors (VS Code)

Hands-On:

Write your first Python script.

Outside Work:

Print your name, age, and favorite hobby using `print()`.

Session 2 – 6/11/25: Variables and Data Types

Topics:

- Variables
- Data types: `int`, `float`, `str`, `bool`
- Input from the user with `input()`

Hands-On:

Build a simple program that asks for the user's name and age, then responds with a greeting.

Outside Work:

Create a calculator that adds two numbers entered by the user.

Session 3 – 6/18/25: Conditional Statements

Topics:

- `if`, `elif`, `else`
- Comparison and logical operators

Hands-On:

Write a program to check voting eligibility or simple password protection.

Outside Work:

Write a program that checks if a number is positive, negative, or zero.

6/25/25: No Meeting

7/2/25: No Meeting

Session 4 – 7/9/25: Loops

Topics:

- while loops
- for loops
- Looping through ranges and strings

Hands-On:

Write a number guessing game or a multiplication table.

Outside Work:

Use a loop to sum numbers from 1 to 100.

Session 5 – 7/16/25: Working with Strings and Numbers

Topics:

- String operations and formatting
- Type conversion
- Math functions (round, abs, min, max)

Hands-On:

Build a simple temperature converter or currency converter.

Outside Work:

Write a program that reverses a user-entered string.

Session 6 – 7/23/25: Collections

Topics:

- Creating and modifying lists, tuples and dictionaries
- Iterating over collections
- Basic collection manipulation

Hands-On:

Create a to-do list program or a simple contact list.

Outside Work:

Make a list of favorite movies and allow the user to add/remove items.

Session 7 – 7/28/25: Functions

Topics:

- Defining and calling functions
- Parameters and return values
- Scope (local vs global)

Hands-On:

Write a function that checks if a number is prime or calculates factorial.

Outside Work:

Rewrite a past homework using functions.

Session 8 – 8/6/25: Turtle Graphics

Topics:

- Creating a
- Try/except blocks

Hands-On:

Create a simple text-based note-saving app.

Outside Work:

Make a program that saves and loads a list from a file.

Session 9 – 8/13/25: Classes

Topics:

- Introduction to classes
- Class instance initialization
- Class member variables
- Class methods

Hands-On:

Create a class to create and manage a grocery list.

Outside Work:

Side project that you may want to work on with a team going forward

Session 10 – 8/20/25: Files and Error Handling

Topics:

- Reading from and writing to files
- Try/except blocks

Hands-On:

Create a simple text-based note-saving app.

Outside Work:

Make a program that saves and loads a list from a file.