Python Foundation Syllabus

Before You Start

Educational Objectives: Learn Python programming fundamentals such as data types and structures, variables, loops, and functions. You will work on NumPy and Pandas to handle and manipulate data.
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Program Design
*Length of Program**: The program is of 3 months We expect students to work 10 hours/week on average.

Project 1: Explore US Bikeshare Data (40 hrs)

You will use Python to perform steps of the data analysis process on bikeshare trip data collected from three US cities. You will write code to clean the data, compute descriptive statistics, and create basic visualizations of the distribution of data.

Supporting Lesson Content: Introduction to Data Analysis

Lesson Title	Learning Outcomes
NUMBERS AND STRINGS	➔ Learn about Python's numeric and string data types ➔ Use variables to store data ➔ Use built-in functions and methods
FUNCTIONS, INSTALLATION, AND CONDITIONALS	➔ Install Python on your computer ➔ Organize your code into functions Use ➔ conditionals to make decisions
DATA STRUCTURES AND LOOPS	➔ Use collection data types: lists, sets, and dictionaries ➔ Write `for` and `while` loops to express repetition ➔ Practice refactoring and problem solving
FILES AND MODULES	➔ Use modules from the Python standard library and from third-party libraries ➔ Read data from files on disk ➔ Use online resources to help solve problems

Project 2: Movie Trailer Website.

In this project, you will write server-side code to store a list of your favorite movies, including box art imagery and a movie trailer URL. You will then serve this data as a web page allowing visitors to review their movies and watch the trailers

Supporting Lesson Content:

Lessons: Programming Foundations with Python

Lesson Title	Learning Outcomes
Use Functions	➔ Tour the Python standard library ➔ Use programming librarydocumentation
Use Classes: Draw Turtles	➔ Use classes and objects to draw graphics
Use Classes: Send Text	➔ Use the Twilio web API to send SMS messages
Use Classes: Profanity Editor	➔ Read and write to and from files ➔ Accessing web APIs with the Python urllib library
Make Classes: Movie Website	➔ Write programs using Object Oriented Programming (OOP) design
Make Classes: Advanced Topics	➔ Reuse code with class inheritance ➔ Customize inherited classes with method overriding