Data Analytics with Python: 3-Week Course Outline

This course provides a foundational introduction to data analysis using Python. Over two weeks, you'll gain hands-on experience with essential tools and techniques for data manipulation, visualization, and basic analysis.

Week 1: Python Fundamentals and Data Preparation

- Introduction to Data Analytics and Python
- Setting Up Python Environment (IDE/Jupyter Notebook)
- Python Basics: Variables, Data Types, Operators
- Control Flow: Conditional Statements (if/else) and Loops (for/while)
- Functions: Defining and Using Functions for Code Reusability

Week 2: Python Fundamentals and Data Preparation

- Introduction to NumPy: Arrays and Vectorized Operations for Efficient Data Manipulation
- Data Input/Output (I/O): Reading and Writing Data from Various Sources (CSV, Excel).
- Introduction to Pandas: DataFrames - Powerful Data Structures for Tabular Data
- Data Cleaning Techniques: Handling Missing Values, and Outliers
- Data Exploration with Pandas: Descriptive Statistics, Groupby Operations

Week 3: Data Visualization and Basic Analysis

- Introduction to Matplotlib: Creating Basic Plots (Line, Scatter, Histogram)
- Customization of Plots: Titles, Labels, Legends, Colors, and Styles
- Introduction to Seaborn: Building on Matplotlib for Statistical Visualization
- Creating Informative Charts and Visualizations for Data Exploration
- Introduction to Exploratory Data Analysis (EDA): Identifying Trends, Patterns, Relationships
- Data Aggregation and Transformation for Analysis
- Introduction to Hypothesis Testing: Basic Concepts and Statistical Significance

Case Study: Applying Learned Techniques to Analyze a Real-world Dataset.