Python Crash Course for Engineers

Class 1: Introduction to Python and Programming Basics

- Overview of Python and its importance in engineering
- Setting up the development environment (Python installation, IDEs)
- Python syntax, data types, and variables
- Basic input/output and control flow (if statements, loops)
- Functions and modular programming

Class 2: Advanced Python Programming

- Lists, tuples, and dictionaries
- File handling and working with text files
- Exception handling and error management
- Object-oriented programming (classes and objects)
- Inheritance and polymorphism

Class 3: Introduction to NumPy and Data Manipulation

- Introduction to NumPy and its role in data manipulation
- Creating and manipulating arrays using NumPy
- Basic mathematical operations with NumPy arrays
- Data filtering and manipulation techniques

Class 4: Introduction to Pandas and Data Analysis

- Introduction to Pandas and its role in data analysis
- Data structures in Pandas (Series and DataFrame)
- Loading, cleaning, and exploring data using Pandas
- Basic data analysis and visualization with Pandas

Class 5: Basic Machine Learning with Python

- Introduction to machine learning and its applications in engineering
- Overview of scikit-learn library
- Supervised learning: Regression and Classification
- Hands-on example of a simple machine learning project

- Discussion on further machine learning and data science resources