Machine Learning and Data Science - Syllabus

Introduction to Machine Learning - 2 hours

1. Machine learning and its need.
2. Recent development in Machine Learning.
3. Types of Machine Learning Systems.
4. Challenges in Machine Learning.
5. Machine Learning workflow.
6. Basic Introduction to Neural Networks.

Introduction to Python Packages and Dependency Management- 1 hour

1. Introduction to Python Package Index (PyPI).
2. Introduction to conda and pip for dependency management.

Setting up the ML-Environment - 2 hours

1. Setting up the IDE
2. Introduction to Jupyter Notebook and Google Collab.

Introduction to Machine Learning Libraries - 4 hours

1. Numpy
2. Pandas
3. Matplotlib
4. Scikit Learn

Machine Learning Model Evaluation Metrics - 2 hours

1. Introduction to machine learning models.
2. Measuring accuracy of a model.
3. Introduction to Precision/Recall.
4. Confusion Matrix and relation with Precision and Recall.
5. Introduction to Bias and Variance.

Supervised Machine Learning Algorithms - 8 hours

1. Introduction to supervised approach.
2. Linear Regression
3. Logistic Regression.
4. K-Nearest Neighbors.
5. Decision Trees.

Unsupervised Machine Learning Algorithms - 4 hours

1. Introduction to Unsupervised approach.
2. Clustering and Associations.

Ensemble Methods and Dimensionality Reduction - 5 hours

1. Introduction to Ensemble Learning Method.
2. Bagging/Boosting
3. Introduction to Curse of Dimensionality.
4. PCA for Dimensionality Reduction.

Introduction to Data Science - 2 hours

1. Introduction to data and data source.
2. Project Structure for data science.
3. Data Preprocessing and feature engineering.

Exploratory Data Analysis - 6 hours

1. Understanding the story behind data.
2. Data Manipulation using Pandas.
3. Data Visualization.

Working with Texts in Python - 6 hours

1. Introduction to NLP
2. Handling texts and text analysis.
3. Basic Introduction to Spacy.

Model deployment with Flask - 3 hours

1. Introduction to Flask
   Model Management and Deployment