

Machine Learning Training and Internship Program Syllabus

15 Days (Introduction to Machine Learning)

Objective:

- Understand the fundamentals of machine learning and build a basic model.

Syllabus:

1. **Day 1-3:** Introduction to ML
 - a. What is ML? Types (Supervised, Unsupervised, Reinforcement Learning).
 - b. Basic Python for ML: NumPy, pandas, and matplotlib.
2. **Day 4-6:** Data Preprocessing
 - a. Handling missing data, encoding categorical data, scaling features.
 - b. Introduction to data visualization with seaborn.
3. **Day 7-9:** Linear Regression
 - a. Simple linear regression.
 - b. Implementing linear regression with Python (scikit-learn).
4. **Day 10-12:** Classification Basics
 - a. Logistic regression.
 - b. Evaluating models with accuracy, precision, recall, and F1-score.
5. **Day 13-15:** Hands-On Mini Project
 - a. Predict house prices using linear regression.
 - b. Classification of Iris dataset.

30 Days (Beginner-Level ML)

Objective:

- Develop foundational ML models and understand essential concepts.

Syllabus:

1. **Week 1:** Python and Statistics for ML
 - a. Advanced Python libraries for ML (scikit-learn, pandas).
 - b. Descriptive and inferential statistics for data analysis.
2. **Week 2:** Supervised Learning Models
 - a. Decision trees and random forests.

- b. Support vector machines (SVM).
- 3. **Week 3:** Unsupervised Learning Models
 - a. Clustering with K-means and hierarchical clustering.
 - b. Dimensionality reduction using PCA.
- 4. **Week 4:** Mini Project
 - a. Customer segmentation using clustering techniques.

45 Days (Intermediate-Level ML)

Objective:

- Work on intermediate ML concepts, hyperparameter tuning, and model evaluation.

Syllabus:

1. **Week 1:** Advanced Regression Techniques
 - a. Polynomial regression.
 - b. Ridge and Lasso regression.
2. **Week 2:** Advanced Classification Techniques
 - a. K-Nearest Neighbors (KNN).
 - b. Naive Bayes and ensemble techniques (Bagging, Boosting).
3. **Week 3:** Model Evaluation and Tuning
 - a. Cross-validation techniques.
 - b. Hyperparameter tuning (GridSearchCV, RandomizedSearchCV).
4. **Week 4-5:** Hands-On Project
 - a. Fraud detection using classification algorithms.