**Machine Learning with Python:**

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| **Module-1: Statistics** |
| What is Statistics? |
| Descriptive and Inferential Statistics |
| Types of Data |
| Measures of Central Tendency |
| Mean |
| Median |
| Mode |
| Comparison between Mean, Median and Mode |
| Measures of Dispersion |
| Range |
| Inter Quartile Range |
| Standard Deviation |
| Variance |
| Normal Distribution |
| Empirical Rule |
| Chebyshev Rule |
| Five Number Summary |
| Skewness |
| Outlier |
| Box plot |
| Probability Basics |
| Mutually Exclusive Events |
| Independent Events |
| Marginal Probability |
| Conditional Probability |
| Joint Probability |
| Baye’s Theorem |
| Central Limit Theorem |
| Covariance |
| Correlation |
| Pearson Correlation |
| Spearman Correlation |
| Outlier analysis |
| Hypothesis Testing |
| Z Test |
| T Test |
| F Test |
| ANOVA |
| Chi Square Test |

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| **Module -2: Python** |
| Installing Python |
| Python IDEs |
| Jupyter Notebook Overview |
| Python Basic Data types |
| Lists |
| Dictionaries |
| Tuples |
| Functions |
| Array Selection by position & Labels |
| Reading CSV files |
| Saving in Python data |
| Loading Python data objects |
| Writing data to CSV file |
| Selecting rows/observations |
| Exploratory Data Analysis |

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| **Module -3**: **Machine Learning** |
| What is Data Science? |
| What is Machine Learning? |
| What is Deep Learning? |
| What is AI? |
| Linear Regression |
| Linear Equation- Slope Intercept |
| R square value |
| Regression |
| MSE |
| RMSE |
| MAPE |
| Practical Implementation-Linear Regression |
| Logistic regression |
| Confusion Matrix |
| Precision |
| Recall |
| Specificity |
| F1 Score |
| Practical Implementation-Logistic Regression |
| Underfitting |
| Overfitting |
| Euclidean Distance |
| Manhattan Distance |
| Bias Variance Trade off |
| K Nearest Neighbour |
| Naïve Bayes Classifier |
| Practical Implementation-KNN, Naïve Bayes |
| Hyperplane |
| SVM |
| Practical Implementation-SVM |
| Decision Tree |
| Bagging |
| Practical Implementation-Decision Tree and Bagging |
| Boosting techniques |
| Practical Implementation- Boosting |
| Comparison between Bagging and Boosting |
| Introduction to Unsupervised Learning |
| Revision on Supervised Learning |
| K-Means |
| K Means ++ |
| Hierarchical Clustering |
| Practical Implementation-K Means, Hierarchial |
| Feature Engineering |
| Cross validation Techniques |
| Bootstrap Sampling |
| Up sampling and Down Sampling |
| ROC Threshold Management |
| Pipeline |
| Randomized search CV |
| Grid search CV |
| Hyperparameter Tuning |
| Model Tuning |

Total Hours: 40 hours