



Advaitha Information  
Technology Services

# DATA SCIENCE MASTERY PROGRAM

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**Learn**

**Live.**

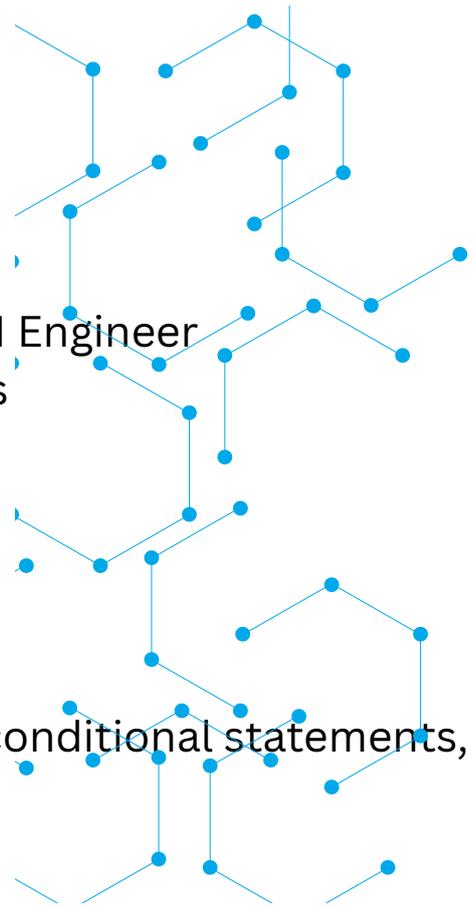
**Learn  
Smart.**

**Learn**

**Data**

**Science.**





## Module:1

### Introduction To Data Science

- Data Science and its Lifecycle
- Key roles: Data Analyst, Data Scientist, AI Engineer
- Introduction to key tools and frameworks

## Module:2

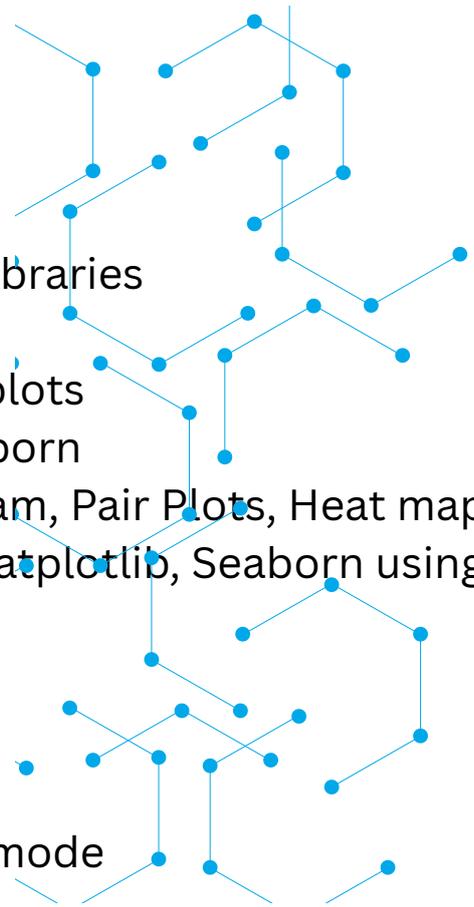
### Python

- Introduction to python
- Installation of Anaconda (jupyter)
- Python basics: variables, data types, conditional statements, loops
- Lists, dictionaries, sets, tuples
- List comprehensions
- Functions
- Map, reduce, filter
- File handling
- Classes and objects

## Module:3

### Data Cleaning and Preprocessing

- Introduction to python Libraries: Numpy, pandas
- Data Transformations: Arrays, dimensions in arrays
- Handling Missing Values
- Duplicates
- Aggregate Functions
- Data Type Conversions
- Combining and splitting datasets



## Module:4

### Exploratory Data Analysis (EDA)

- Introduction to Matplotlib, Seaborn Libraries
- Basic Plotting using Matplotlib
- Analyzing data using Bar, pie, scatter plots
- Correlation and covariance using Seaborn
- Advanced data analysis using Histogram, Pair Plots, Heat maps
- Live Application of Numpy, Pandas, Matplotlib, Seaborn using real time datasets.

## Module:5

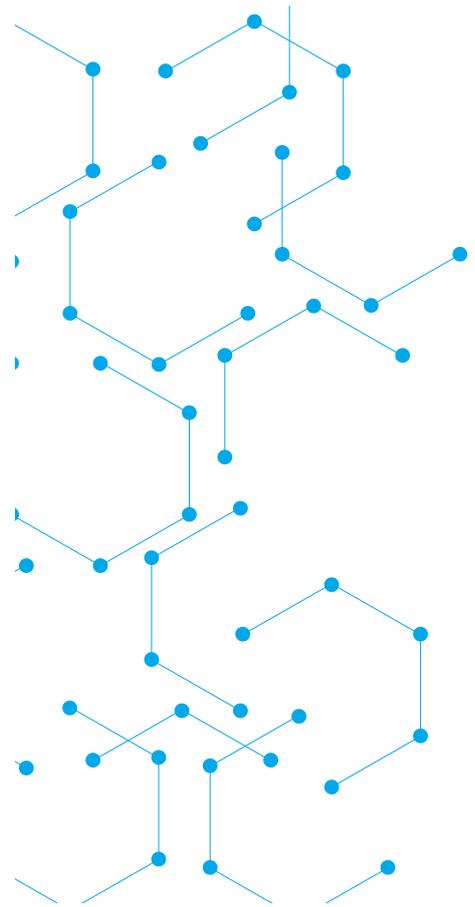
### Statistics And Probability

- Descriptive statistics: mean, median, mode
- Inferential statistics
- Probability distributions: normal, binomial
- Hypothesis testing: z-test, type-I and type-II errors
- Chi-square test
- Confidence intervals

## Module:6

### Preprocessing Techniques

- Introduction to Sklearn library
- Importing models using Sklearn
- Imputing missing values
- Handling categorical data using-encoding techniques
- Label encoder, one-hot encoder
- Scaling data
- Min-max scaler, Standard scaler, Robust scaler
- Normalization
- Feature selection



## Module:7

### Introduction to Machine Learning

- Overview of AI and ML
- ML vs AI vs DL
- History and Applications of AI
- Types of ML

## Module:8

### Introduction to Supervised Learning

- Linear Regression
- Supervised Learning Algorithm
- Linear Regression
- Multi Linear Regression
- Theory, Assumptions, Implementation
- Evaluation metrics: MAPE, MSE, RMSE, R2, & Model Training

## Module:9

### Supervised Learning: Classification

- Decision Tree: Theory and implementation (Gini index)
- Logistic Regression (Sigmoid Function) Theory and implementation
- KNN -KNearestNeighbours, Working, Distance Metrics
- Naïve Bayes
- Support Vector Machines (SVM): Theory, Hyperplanes, Kernels
- Model Evaluation: Confusion Matrix, Roc Curve, AUC, F1 Score, Precision, Recall

## Module:10

### Ensemble Methods

- Bagging: Random Forest
- Boosting: AdaBoost, Gradient Boosting
- Model Evaluation with cross validation



## Module:11

Unsupervised Learning: Clustering

- Clustering Algorithms: K-means, DBSCAN, Hierarchical Clustering
- Dimensionality Reduction: Principal Component Analysis (PCA), t-SNE
- Evaluating Clustering: Silhouette Score, Elbow Method

## Module:12

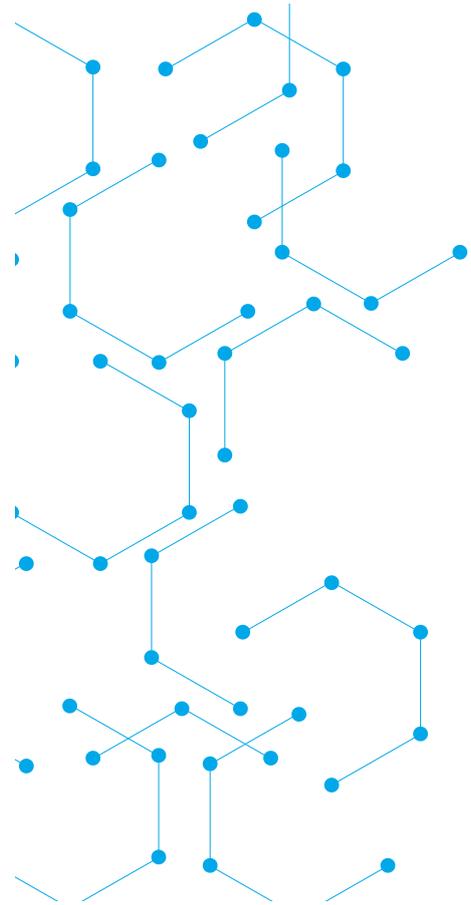
Deep Learning

- Introduction to Neural Networks: Neurons, Layers, Activation Functions
- Forward Propagation
- Backward Propagation
- Optimization Algorithms: Gradient Descent
- Introduction to Keras and TensorFlow
- Understanding of CNN (Convolution Neural Networks)
- Recurrent Neural Networks (RNN)
- Hyperparameter Tuning in Deep Learning

## Module:13

Natural Language Processing ( NLP)

- Text Preprocessing: Tokenization, Lemmatization, Stop Words
- Bag of words and TF-IDF
- Text Preprocessing
- Segmentation Analysis
- Implementation using SVM, Naïve Bayes



## **Module:14**

### **PowerBi**

- Introduction to power-bi
- Data extraction process
- Data Transformation
- Data Modelling and DAX
- Data Visualization with analysis
- Live Application

## **Module:15**

### **Data Analysis using SQL**

- SQL-Overview
- SQL commands-RDBMS concepts
- What is Database
- Difference between DBMS AND RDBMS
- Sub Languages in SQL
- SQL-Syntax-Data Types
- Operators
- Where-AND and OR
- Order By, Group By, Having Clauses
- SQL-joins, Constraints
- Select, create, delete, drop, insert
- Connectivity with powerbi

## **Module:16**

### **Analysis with Excel**

- Introduction to Excel
- Functions, Formulas and Charts
- Pivots and Lookups
- Ranges and Tables
- Conditional Formatting
- Data Visualization