



# **INFYNAS Learning** **Solutions**

Take a step ahead in education!

## **AI & Machine Learning** **using Python**

Duration: 30 Hours | Instructor-led Interactive Training

**TRAINING** | **CERTIFICATION** | **PLACEMENT**

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## Course Overview

AI & Machine Learning is acclaimed as one of the best career opportunities with application in practically every sector of professional activities – e.g., e-commerce, manufacturing, IOT and robotics, medical field, security to fashion. This course aims to accelerate your career in Data Science and provides you with world-class training and skills required to become successful in this field. The Data Scientist course offers extensive training on the most in-demand Data Science and Machine Learning skills with hands-on exposure to key tools and technologies including Python, Data Visualization, concepts of Machine Learning and introduction of Deep Learning. Python has become number one choice for data science, Machine Learning & Artificial Intelligence applications. The training is a practical oriented, step by-step guidance to Data Science using Python.

## Course Highlights

- 30 Hours Instructor-Led Classroom and Live Training
- Practical oriented project-based training
- Deliverables: Codes, Class notes and Additional study materials
- Certificate of participation to all trainees

## Projects implemented during training

- House price prediction
- Diabetics prediction models
- Customer churn prediction
- Breast cancer prediction
- Titanic survival prediction
- Used car price prediction

## Learning Outcome

- Understand concept of Data Science, Machine Learning & AI
- New aspects of Data Science
- Data Science best practices
- Data Science tools and techniques
- How to implement Data Science techniques
- Understand different types of learning algorithms
- Understand various techniques of exploratory data analytics
- Build models practically using python libraries.
- How to extract insights from data
- Participants will be able to work on industry-based projects

## Delivery method

Instructor lead, hands-on exercises backed with assignments and mini project

## Session Topics

### Introduction to AI

- Needs and opportunities
- Meaning, Difference and relationships

- Introduction to AI
- Introduction to Data science
- Machine learning data analytics
- Introduction to Deep learning
- Traditional programming and machine learning
- Use case of each and tools used

### **Types of ML algorithms**

- Supervised Learning, Semi-Supervised and Unsupervised Learning
- Difference between regression classification and clustering

### **Python basics**

- Creating programming environment
- Install necessary tools and packages
- Installing anaconda
- Installing python IDE's
- Working with jupyter workbook

### **Programming with python**

- Overview of Python- Starting with Python
- Python features
- Data types: Primitive and sequence types Lists, Tuples, Dictionaries
- String, - working with strings
- Operators, Functions, Packages,
- Control structures in python
- User defined functions

### **Python libraries for Data science and Machine learning**

- Working with numpy, scipy and pandas
- Importing Data from various sources like CSV excel text
- Working with pandas dataframe
- Data wrangling with pandas Sorting, filtering, merging, appending, sampling, Data type conversions, renaming, formatting
- Null value treatment
- More data preprocessing – scaling normalization outlier detection

### **Data visualization with Matplotlib and Seaborn**

- Boxplot
- Scatter Plot
- Bar chart
- Pie chart
- Heatmap
- Histogram

## Machine learning algorithms

### Regression model

- Introduction of a regression problem, dependent and independent variables.
- Data preprocessing for regression
- Cost function
- Train the model in a regression problem.
- Performance metrics for a regression problem. R2, adjusted r2, mean squared error,
- How to optimize the efficiency of the regression model.
- Model regularization L1 and L2
- Ridge regression
- Lasso regression

### Logistic Regression

- Assumptions
- Logit function
- Using logistic regression with python

### K-Nearest Neighbors – Algorithm

- KNN working for classification problems
- KNN working for regression problems
- Implementation of KNN algorithm

### Metrics for classification

- **Classification reports** – To evaluate the model on various metrics like recall, precision, f-support, etc.
- **ROC curve**
- **Confusion matrix** – To evaluate the true positive/negative, false positive/negative outcomes in the model

### Clustering – K Means and Hierarchical

- Unsupervised Learning
- Clustering Introduction
- Finding the best K
- Elbow Method – Picking K in K-Means
- Hierarchical Clustering
- Types – Agglomerative and Divisive
- Dendrogram

### Decision Tree Algorithm

- Concept and Working Principle
- D decision Tree algorithms: CART vs. ID3
- Concept of Entropy, Gini Index and Information Gain in Decision Trees
- Implementing decision tree
- Checking Performance
- Visualizing decision tree

### Dimensionality reduction concept

- Introduction
- Need for Dimensionality reduction
- principal component analysis

### Ensemble learning methods

- Concept of Bagging and boosting
- Implementation of Ensemble
- Random forest
- XG boost

### Hyperparameter tuning

- What is hyperparameter
- Cross validation techniques
- Implementation

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### Projects

- Hands-on session on Python Libraries & Data processing
- Applying different algorithms to solve business problems
- Unique incremental project completion method will be applied

## Who can be benefited by this training

Individuals and Professionals who can consider **Data Science course** as a next logical move to enhance their careers. We welcome Freshers from any stream, Any Graduates, Any Post-Graduate, Any Engineers, Working Professionals from any domain, Tech Enthusiasts, Entrepreneurs, and those who see the future in the Data Science industry. There's a lot behind learning the Data science, because of its vast scope and it is expected to be the most attractive industry in the coming generations

## Prerequisite

There is no prerequisite for this training no programming background is essential.

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