



Skill - Innovate – Grow

Training Division

Course Name: AI and Data Science

Course Description: Master the core concepts in Data Science & AI. Gain in-depth knowledge in Python, SQL, Machine Learning, algorithms and more. The program is in line with the current Data Science, Artificial Intelligence and Machine Learning market and focuses on helping you master all the relevant tools and techniques.

Target audience: This program is for Engineers, Marketing & Sales Professionals, Freshers, Domain Experts, Software & IT Professionals. After completion of this, the job opportunities will be - Data Analyst, Data Scientist, Data Engineer, Product Analyst, Machine Learning Engineer, Decision Scientist.

Advantages:

A. Topics covered: AI (Artificial Intelligence)

1. *The Evolution of AI*
What is AI, Philosophical foundations and history of AI, Intelligent Agents.
2. *Problem-Solving Methods*
Classical search-based problem solving, Adversarial Search-based problem solving, Constraint satisfaction-based problem solving.
3. *Knowledge, Planning and Reasoning*
Knowledge based agents, First order logic, Inference in first order logic, Planning and acting in real world by agent's behaviour modelling, Knowledge representation.
4. *Uncertainty in Knowledge mining and Reasoning*
Quantifying uncertainty, Probabilistic reasoning, Algorithmic utilities for making simple and complex decisions.
5. *Learning*
Learning with examples, Knowledge extraction role in learning, Learning of probabilistic models, Reinforcement learning.
6. *Perceiving, Communication and Acting*
Natural language processing and communication, Perception of intelligent agents, Robotics, Software architectures for planning uncertain movements.

B. Topics covered: DS (Data Science)

1. *Foundations*

Data exploration and basic analysis in excel, Analytics problem solving strategies.

2. *Data Toolbox*

Python basics, Python for Data Science, Exploratory data analysis in Python, Data visualisation using Python libraries, Inferential statistics, Hypothesis testing, SQL for data analysis.

3. *Machine Learning*

Linear Regression, Logistic Regression, Supervised learning: classification using Decision Trees, Unsupervised learning: k-means and hierarchical k-means clustering, Basics of text mining and Natural Language Processing.

4. *Deep Learning*

Model selection, Advanced regression, Time-series data processing, Artificial Neural Networks, Multilayer perceptron, Convolutional Neural Networks, Image segmentation, Image classification, Object detection, Gesture recognition, Recurrent Neural Networks, Generative Adversarial Nets (GANs).

5. *Natural Language Processing*

Neural Nets for NLP, Syntactic Processing, Semantic Processing, Applied Deep Learning algorithms in NLP.

6. *Business Intelligence and Analytics*

Visualisation using PowerBI, Operations Research in Excel, Data Strategy and architecture.

7. *Data Engineering*

Introduction to Big Data, Data Management and Relational Database Modelling, Introduction to Cloud and AWS Setup, Data Warehousing, Data Ingestion with Apache Sqoop and Apache Flume, Hive & Querying, ETL Data Pipeline, AWS/Microsoft Azure Cloud Infrastructure, Real-Time Data Streaming with Apache Kafka, Real-Time Data Processing using Spark Streaming, Building Automated Data Pipelines with Airflow, Large-scale data analytics using PySpark.

C. Live Projects

Projects will be a part of AI & Data Science to consolidate your learning. It will ensure that you have real-world experience in Data Science.

1. Technology

Python and its associated libraries

- NumPy
- SciPy
- Matplotlib
- Pandas

2. Get an insight about the projects –

- Text Encoding Decoding, Text Summarisation
- Face recognition system
- AirBnB Case Study

- Spam detection and hate speech classification
- Medical documents summarization
- Recommendation system design
- Building intelligent Chatbot
- Human Activity Recognition
- Handwriting Recognition
- Music Genre Classification
- Automatic Image's Caption Generator
- Content based image retrieval
- Face detection
- AI Chatbot
- Restaurant revenue prediction
- Work with Pyspark & RDD
- Build the book remainder application
- Census project

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