SYLLABUS

Data science & Artificial intelligence – Netzwerk Academy

The course will be pursued in 5 different sections

1. **Induction Class**
    a. What is Artificial Intelligence, Machine Learning and Data Science
    b. Why is it era of Artificial Intelligence
    c. Business intelligence v/s Data Science
    d. Introduction to Python programming language
    e. Introduction to Machine learning

2. **Mathematics**
    I. Statistics
    II. Probability
    III. Linear Algebra
    IV. Calculus

3. **Python**
    a. Basics
    b. Control Flow and Iterations
    c. In-built Data Structures
    d. Functions
    e. Exception handling
    f. File handling
    g. Classes in Python
    h. NumPy

i. Matplotlib
j. Pandas

4. Machine learning

a. Introduction
b. Types of data and extraction
c. Raw & Processed data
d. ED Analysis
e. Types of Machine learning
    i. Supervised
        1. Regression
        2. Classification
    ii. Unsupervised
        1. Clustering
f. Linear Regression
g. Logistic Regression
h. KNN
i. Decision Trees
j. Model Selection
    i. Over Fitting & Under Fitting
    ii. Regularization: Ridge and Lasso
    iii. Feature Engineering
    iv. Model Selection
    v. Cross Validation
    vi. Feature Engineering
    vii. Normalization & Standardization
    viii. Hyper Parameter Tuning
k. Support Vector Machine (SVM)
l. Gradient Boosting
m. Extreme Gradient Boosting & XG boost

5. Real Time Case Study + Project

6. **Deep learning**
    a. Introduction
    b. Artificial Neural Networks
    c. Introduction to KERAS
    d. MNIST Dataset
    e. Convolution Neural Networks (CNN)
    f. Introduction to TensorFlow & PyTorch
    g. RNN (Recurrent Neural Networks) and LSTMs
    h. Project- Stock Prediction using LSTMs

7. **CV – Computer Vision**
    a. OpenCV
    b. Convolution Operation and Feature Extraction
    c. Feature Visualization and CNN layers
    d. CNN architecture (AlexNet, Inception, ResNet, LeNet)
    e. YOLO Object Detection
    f. Image captioning using CNN & RNN
    g. Motion
    h. Robot Localization
    i. State Transformation
    j. Vehicle Motion
    k. Autoencoders
    l. GAN (Generative Adversarial Network)
    m. Project

The projects and the concepts may vary slightly based on the industry requirements. As our trainers are industry experts we leave it to trainers to decide the best concepts for you