

CERTIFICATE COURSE ON DATA SCIENCE WITH

2. MACHINE LEARNING AND DEEP LEARNING

USING PYTHON

UNIT-I

Introduction to Data Science: Life Cycle of data science, Collection, Storing , Processing, Describing, Modeling

UNIT-II

Data Preprocessing Techniques: Data Imputation, Data Encoding ,Data Integration, Data Normalization, Outlier detection Techniques, Dimensionality reduction ,Feature Engineering
Exploratory Data Analysis (EDA) Univariate Analysis, Multivariate, Analysis Case studies

UNIT-III

Machine Learning (Supervised Learning)

Introduction to Machine Learning, Types of Machine Learning, Supervised Learning, Unsupervised Learning, Reinforce Learning
Regression Analysis, Simple Linear Regression, Multilinear Regression, Polynomial Regression, Regularization Techniques, Metrics for Evaluation, Case Studies,
Classification Techniques :KNN classifier ,Logistic Regression classifier, Decision Tree classifier, Naïve Bayes Classifier, SVM classifier, Random Forest classifier, Ensemble methods, Boosting algorithms, Bagging algorithms, Stacking algorithms, Case Studies and Applications,
Building and Deployment of MLclassifier using Flask framework

UNIT-IV

Bias, Variance and Optimization Techniques: – Model Selection and Evaluation for classification, Train/Validation/Test split, K-Fold Cross Validation

The Problem of Over-fitting and Underfitting (Bias-Variance trade-off)

Learning Best Practices for Model Evaluation and Improvement:ML Pipeline techniques,Parameter Tuning mechanisms (Grid Search/ Random Search),Debugging algorithms with learning and validation curves

UNIT-V

Machine Learning(Unsupervised Learning): Similarity distance measures, Clustering Analysis, K-means Clustering, Hierarchical Clustering, DB Scan Clustering

Case, Studies, Association Analysis: Association Rules & Interesting measures, Apriori Algorithm, FP-Growth algorithm, Case Studies

UNIT-VI

Fundamentals of Deep Learning:

Introduction to Deep Learning, Tensor Flow, Basic programming ,sing Tensor Flow,Basics of Image Processing, Neural Network Basics, Activation Functions, Loss functions, non-linearity, Multilayer Perceptron Algorithm, Gradient Descent Algorithm, Adam Techniques