



K. K. Wagh Education Society's

K. K. Wagh Arts, Commerce, Science & Computer Science College, Kakasaheb Nagar

At. Post. Kakasaheb Nagar, Tal. Niphad, Dist. Nashik – 422308.

(Affiliated to Savitribai Phule Pune University)

SPPU ID: PU/NS/ACSCS86/2004

College Code: 774

A.I.S.H.E. Code: C-42166



+ 91-2550- 257291



principal-seniorknagar@kkwagh.edu.in



[www.https://asck.kkwagh.edu.in](https://asck.kkwagh.edu.in)

Certificate Course: "Machine Learning"

Duration: 03 Months

Per Week Lectures: 4

Course Code: (KKWMIC001)

Total Marks: 50

Syllabus (2023-24)

Objectives:

1. The course is designed to aim at imparting a basic level appreciation programme for the Student.
2. After completing the course students is able to the use the computer for basic purposes of preparing his personnel/business letters, viewing information on Internet (the web), sending mails, using internet banking services etc.
3. This helps the Students to maintain their small account using the computers and enjoy in the world of Information Technology.

Sr. No.	Name of Topic	Lectures (30)
1.	1. Introduction to Machine Learning 1.1 Data Science, Artificial Intelligence and Machine Learning 1.2 Why Learn and What is Learning, What is Machine Learning Traditional Programming Vs. Machine Learning, Machine Learning Process, Types of Data, Key Elements of Machine Learning (Representation, Evaluation and Optimization), Dimensionality Reduction (Feature Reduction) 1.3 Descriptive and Inferential Statistics: Probability, Distribution, Distance Measures (Euclidean and Manhattan), Correlation and Regression, Hypothesis Testing. Creating our own dataset, Importing the dataset, Handling Missing Data, Splitting the dataset into the Training set and Test set, Feature Scaling	06
2.	2. Machine Learning Models 2.1 Type of Learning- Supervised, Unsupervised and SemiSupervised Learning 2.2 Components of Generalization Error (Bias, Variance, underfitting, overfitting) 2.3 A Learning System Cycle and Design Cycle 2.4 Metrics for evaluation viz. accuracy, scalability, squared error, precision and recall, likelihood, posterior probability 2.5 Classification Accuracy and Performance	06
3.	3. Regression Models 3.1 Linear Regression - Simple , Multiple, Polynomial 3.2 Non-linear Regression – Decision Tree, Support Vector, Random Forest	04
4.	4. Classification Models 10 4.1 K – Nearest Neighbours (KNN) 4.2 Logistic Regression 4.3 Naive Bayes Theorem 4.4 Support Vector Machine 4.5 Decision Forest Classification 4.6 Random Tree Classification	06

5.	5. Clustering Models 5.1 K-means 5.2 Hierarchical Clustering (Agglomerative, Divisive), Dendrogram 5.3 Selecting optimal number of clusters: Within Clusters Sum of Squares (WCSS) by Elbow Method	03
6.	6. Association Rules 6.1 Key Terms: Support, Confidence and Lift 6.2 Apriori Algorithm	02
7	7. Reinforcement Learning 7.1 Upper Confidence Bound 7.2 Thompson Sampling 7.3 Q-Learning	03

References:

- Mitchell, Tom M. "Machine learning. WCB." (1997)..
- Rogers, Simon, and Mark Girolami. A first course in machine learning. CRC Press, 2015
- Machine learning course material by Andrew Ng, Stanford university
- Friedman, Jerome, Trevor Hastie, and Robert Tibshirani. The elements of statistical learning. Vol.1. Springer, Berlin: Springer series in statistics, 2001.

Reference Link:

1)www.W3schools.com

Asst.Prof.A.M.Kale
Co-ordinator

HOD

Principal



K. K. Wagh Education Society's

K. K. Wagh Arts, Commerce, Science & Computer Science College, Kakasaheb Nagar

At. Post. Kakasaheb Nagar, Tal. Niphad, Dist. Nashik – 422308.

(Affiliated to Savitribai Phule Pune University)

SPPU ID: PU/NS/ACSCS86/2004

College Code: 774

A.I.S.H.E. Code: C-42166



+ 91-2550- 257291



principal-seniorknagar@kkwagh.edu.in



[www.https://asck.kkwagh.edu.in](https://asck.kkwagh.edu.in)

Certificate Course: 'Machine Learning'

Schedule Of Course:-

Sr.No	Topic	Description	Name Of Staff
1	Introduction to Machine Learning Association Rules	1.1 Data Science, Artificial Intelligence and Machine Learning 1.2 Why Learn and What is Learning, What is Machine Learning Traditional Programming Vs. Machine Learning, Machine Learning Process, Types of Data, Key Elements of Machine Learning (Representation, Evaluation and Optimization), Dimensionality Reduction (Feature Reduction) 1.3 Descriptive and Inferential Statistics: Probability, Distribution, Distance Measures (Euclidean and Manhattan), Correlation and Regression, Hypothesis Testing. Creating our own dataset, Importing the dataset, Handling Missing Data, Splitting the dataset into the Training set and Test set, Feature Scaling 1.4 Key Terms: Support, Confidence and Lift 1.5 Apriori Algorithm	A.M.Kale
2	Machine Learning Models Reinforcement Learning	2.1 Type of Learning- Supervised, Unsupervised and SemiSupervised Learning 2.2 Components of Generalization Error (Bias, Variance, underfitting, overfitting) 2.3 A Learning System Cycle and Design Cycle 2.4 Metrics for evaluation viz. accuracy, scalability, squared error, precision and recall, likelihood, posterior probability 2.5 Classification Accuracy and Performance 2.6 Upper Confidence Bound 2.7 Thompson Sampling 2.8 Q-Learning	S.S.Jagtap
3	Regression Models Clustering Models	3.1 Linear Regression - Simple, Multiple, Polynomial 3.2 Non-linear Regression – Decision Tree, Support Vector, Random Forest 3.3 K-means 3.4 Hierarchical Clustering	A.N.Pawar

		(Agglomerative, Divisive), Dendrogram 3.5 Selecting optimal number of clusters: Within Clusters Sum of Squares (WCSS) by Elbow Method	
4	Classification Models	4.1 K – Nearest Neighbours (KNN) 4.2 Logistic Regression 4.3 Naive Bayes Theorem 4.4 Support Vector Machine 4.5 Decision Forest Classification 4.6 Random Tree Classification	K.T.Kolhe

Asst.Prof.A.M.Kale
Co-ordinator

HOD

Principal
