SILVER OAK UNIVERSITY
Collage of Computer Application
Bachelor of Computer Application
Subject Name : Machine Learning
Subject Code : 2040233304
Semester : V

Prerequisite:
Programming Skills: Basic Python
Proficiency in at least one programming language is necessary for implementing machine learning algorithms and working with relevant libraries and frameworks. Python is a popular choice due to its simplicity and availability of comprehensive libraries such as NumPy, Pandas, and scikit-learn.

Objective: Machine learning concerns the designing and development of algorithms that allow machines, essentially computers, to evolve realistic or human-like behavior based on the empirical data available. This course aims to discuss the building blocks of Computer vision and Natural Language Processing problem and provide an overview of the machine learning and advanced topic.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Evaluation Scheme				Total Marks
L	**T**	**P**	**C**	**Internal**		**External**		
				TH	**PR**	**TH**	**PR**	
4	0	2	5	40	20	60	30	150

Content:

Unit No.	Course Content	Teaching Hours	Weightage%
1	**Introduction to Machine Learning:** What is Machine Learning? Definition, Scope and Importance Types of Machine Learning: Supervised vs Unsupervised vs Reinforcement Learning Key Terminology: Define essential terms such as features, labels, training data, test data, predictions, and models etc.Tools and technologies of MLChallenges and Limitations of machine learning: including bias, interpretability, data quality, and scalability.Ethical Considerations of machine learning: including issues of privacy, fairness, and accountability.	12	25%
2	**Supervised Learning:** Definition and its fundamental principles. The problem setup, predicting labels or values based on labeled training data.Types of Supervised Learning: regression and classification. Regression: its goal of predicting continuous numerical values. Discuss common regression algorithms such as linear regression, polynomial regression, and support vector regression. Classification: its objective of predicting categorical labels. logistic regression, k-nearest neighbors, decision trees, random forests for classification task	10	20%

Unit No.	Course Content	Teaching Hours	Weightage%
3	**Unsupervised Learning:** Definition and its key characteristics and applications. Describe the problem setup, which involves discovering patterns, structures, and relationships in unlabeled data. Clustering algorithm: -K Means, Dimensionality reduction: - Principal Component Analysis	10	20%
4	**Introduction to ML Libraries:** **Machine learning workflow:** Introduce the general steps involved in the machine learning process, from data collection to model evaluation and deployment. **Tools and library:** Data manipulation library using **Panda,** Preprocessing data using **NumPy,** data preprocessing, model selection, and evaluation using scikit- learn etc.	12	15%
5	**Applications of Machine Learning:** **Image recognition**: How it works, various applications like facial recognition, object detection, and autonomous vehicles. **Fraud detection:** How it works, detect patterns and anomalies in financial transactions, helping identify potentiallyfraudulent activities in areas such as credit card fraud, insurance claims, and cybersecurity. **Recommendation systems:** How it works and analyze user behavior and preferences to provide personalized recommendations, such as movie recommendations on streaming platforms, product suggestions on e-commerce sites, and content recommendations on social media.	12	20%

Course Outcome:

Sr No.	CO Statements	Unit No.
1	Students will be able to learn What is Machine Learning and its Types.	1
2	Student will be able to learn various Supervised Algorithms and learn diff. application areas	2
3	Student will be able to learn various Unsupervised Algorithms and learn diff. application areas.	3
4	Student will understand various python libraries used in machine learning.	4
5	Student will understand Ethical Considerations and Application of Machine Learning.	5

Teaching & Learning Methodology:-

● The course includes a laboratory, where students have an opportunity to

build an appreciation for the concepts being taught in lectures.

● Lectures with live practical example using Projector and Computer

● Experiments shall be performed in the laboratory related to course contents

Major Equipment:

1. Computer System

2. Switches and HUB

3. LAN cable, Crimping Tools

REFERENCE BOOKS:

1. Machine learning by Tom Mitchell, TMH

2. Introduction to machine learning by AthemEalpay din,PHI.

3. Computational Intelligence– An Introduction By IMPAndriesP.Engelbrecht,Wiley Publication

List of Practicals:

No	Experiment List
1	Predict Price of House using Linear Regression.
2	Predict Insurance amount using linear regression.
3	Using linear regression multicolumn/ multivariable predict premium.
4	Using linear regression multicolumn check, the sales on the basis of an advertisement.
5	Using Logistic Regression check, whether the person is going buy insurance or not.
6	Logistic Regression, whether Employee can get Bonus or not.
7	K-nearest, Predict Patient is having benign or malignant Cancer.
8	K-Means algorithm for clustering.

List of e-Learning Resources:

- Kaggle (www.kaggle.com): A popular platform for data science and machine learning competitions. It provides datasets, tutorials, and a collaborative community for learning and practicing machine learning.

- Towards Data Science (towardsdatascience.com): An online platform featuring a wide range of articles, tutorials, and resources on machine learning, data science, and AI. It covers various topics and provides insights from industry experts and practitioners.

- Machine Learning Mastery (machinelearningmastery.com): A comprehensive resource for beginners and intermediate learners of machine learning. It offers tutorials, guides, and practical examples to help build understanding and skills in machine learning algorithms and techniques.

- GitHub (github.com): A code repository platform where you can find open-source machine learning projects, libraries, and resources. It's a great place to explore and contribute to machine learning projects.

- TensorFlow Documentation (www.tensorflow.org): The official documentation for TensorFlow, a popular open-source deep learning framework. It offers comprehensive guides, tutorials, and API references for building and training neural networks.

- PyTorch Documentation (pytorch.org): The official documentation for PyTorch, another widely used deep learning framework. It provides extensive documentation, tutorials, and examples to help you understand and utilize PyTorch for machine learning tasks.