21CYS02	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	L	T	P	C
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Course Objectives

- To acquire advanced Data Analysis skills.
- To acquire industry relevant knowledge and career growth.
- To create AI/ML solutions for various business problems.
- To build and deploy production-grade AI/ML applications.
- To apply AI/ML methods, techniques, and, tools

UNIT I	FOUNDATIONS FOR ARTIFICIAL INTELLIGENCE (AI)	9 Hours

Foundation of AI: Application areas- AI Basics -Divide and Conquer, Greedy, Branch and Bound, Gradient Descent- NN basics: Perceptron - MLP – FFN –Back propagation- Convolution Neural Networks: Image classification, Text classification- Image classification – hyper parameter tuning- Emerging NN architectures

UNIT II	NN BASICS	9 Hours

Convolution Neural Networks - Image classification - Text classification - Image classification and hyper-parameter tuning- Emerging NN architectures- Recurrent Neural Networks- Building recurrent NN- Long Short-Term Memory-Time Series Forecasting

UNIT III	FOUNDATIONS FOR MACHINE LEARNING(ML)	9 Hours

ML Techniques Overview- Validation Techniques (Cross-Validations)- Feature Reduction/Dimensionality reduction- Principal components analysis (Eigen values, Eigen vectors, Orthogonality

UNIT IV	CLUSTERING	9 Hours

Distance measures -Different clustering methods (Distance, Density, Hierarchical)- Iterative distance clustering; Dealing with continuous, categorical values in K-Means- Constructing a hierarchical cluster -K-Medoids, k-Mode and density-based clustering- Measures of quality of clustering

UNIT V	CLASSIFICATION	9 Hours

Classification Naïve Bayes Classifier- Model Assumptions, Probability estimation - Required data processing- M-estimates - Feature selection: Mutual information - Classifier- K-Nearest Neighbors- Support Vector Machines- Decision Trees- Ensembles methods

UNIT VI	RECENT TRENDS	

Recent Trends in Artificial Intelligence and Machine Learning

TOTAL PERIODS: 45

Course Outcomes:

At the end of the course, Students can able to

- Gain knowledge about Data Analysis Skills
- Understand the relevance of AI and ML to grow in your career.
- Develop AI/ML solutions for various business problems.
- Build and deploy production-grade AI/ML applications.

Textbooks:

1. Winston, Patrick Henry. *Artificial intelligence*. Addison-Wesley Longman Publishing Co., Inc., 1984.
2. Zhou, Zhi-Hua. *Machine learning*. Springer Nature, 2021.

Reference Books:

1. Mohammed, Mohssen, Muhammad Badruddin Khan, and Eihab Bashier Mohammed Bashier. *Machine learning: algorithms and applications*. Crc Press, 2016.
2. Hopgood, Adrian A. *Intelligent systems for engineers and scientists: A practical guide to artificial intelligence*. CRC press, 2021.