Course Code	Course Name	Credits
26CM003	FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	04

Course Objectives

- To introduce fundamental concepts, history, and applications of Artificial Intelligence.
- To understand various Machine Learning techniques such as supervised, unsupervised, and reinforcement learning.
- To develop knowledge of data pre-processing, feature engineering, and model building.
- To familiarize students with basic Machine Learning algorithms for classification, regression, and clustering.
- To provide exposure to AI/ML tools and create awareness of ethical issues and real-world applications.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

- Understand the basic concepts, history, types, and applications of Artificial Intelligence.
- Know the different Machine Learning approaches and differentiate between supervised, unsupervised, and reinforcement learning.
- Apply data pre-processing techniques and perform feature selection for building ML models.
- Implement basic Machine Learning algorithms such as classification, regression, and clustering techniques.
- Evaluate model performance using appropriate metrics and interpret results effectively and Demonstrate awareness of AI tools, real-world applications, and ethical issues in Artificial Intelligence and Machine Learning.

Unit –I Introduction to Artificial Intelligence (12 Hrs)

Meaning - definition and scope of Artificial Intelligence - History and evolution of AI -Types of AI: Narrow AI, General AI, Super AI -Applications of AI in various fields (Healthcare, Education, Business, Finance, etc.) -AI vs Human Intelligence - Advantages and limitations of AI.

Unit – II Introduction to Machine Learning (12 Hrs)

Meaning and definition of Machine Learning - Difference between AI and Machine Learning -
Types of Machine Learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning, Training and Testing Data, Applications of Machine Learning

Unit – III Data Preprocessing and Model Building (12 Hrs)

Data collection and data types - Data preprocessing: cleaning, handling missing values - Feature selection and feature engineering - Data normalization and transformation - Splitting data: training, validation, and testing sets - Introduction to model building.

Unit – IV Machine Learning Algorithms (12 Hrs)

Classification Algorithms: Decision Trees, K-Nearest Neighbours (KNN) - Regression Algorithms: Linear Regression - Clustering Techniques: K-Means Clustering - Model evaluation techniques: accuracy, precision, recall

Unit – V Tools, Applications, and Ethics in AI & ML: Introduction to AI/ML tools (12 Hrs)

Python, Scikit-learn, Tensor Flow (basic overview) - Real-world applications and case studies - Introduction to Deep Learning and Neural Networks (basic concepts) - Ethical issues in AI: bias, privacy, security - Future trends in AI and Machine Learning

Reference Books:

1.Patrick Henry Winston, Artificial Intelligence, Third Edition, Addison-Wesley Publishing Company, 2004.
2.Nils J. Nilsson, Principles of Artificial Intelligence, Illustrated Reprint Edition, Springer Heidelberg, 2014.
3.Stuart Russell and Peter Norvig. Artificial Intelligence: A Modern Approach, 3rd Edition, PHI, 2009.
4.Pedro Domingos: 2015 (Basic Books), Machine learning and artificial intelligence, Popular science, technology, Central idea: A “master algorithm” could unify all machine learning methods.

Websites and eLearning Sources:

1.https://www.youtube.com/watch?v=pCet4JFBgYo
2.https://www.youtube.com/playlist?list=PLEiEAq2VkUULyr_ftxpHB6DumOq1Zz2hq
3.https://www.youtube.com/watch?v=qYNweeDHiyU
4.https://www.coursera.org/learn/fundamentals-of-machine-learning-and-artificial-intelligence
5.https://www.oreilly.com/videos/artificial-intelligence-and/9781789953671/
6.https://www.youtube.com/watch?v=wnqkfpCpK1g

COs and Bloom's Taxonomy Mapping – 26CM003		
Course Outcomes	**On successful completion of this course, students will be able to**	**BTL**
CO1	Understand the basic concepts, history, types, and applications of Artificial Intelligence	K1
CO2	Know the different Machine Learning approaches and differentiate between supervised, unsupervised, and reinforcement learning	K4
CO3	Apply data pre-processing techniques and perform feature selection for building ML models	K2
CO4	Implement basic Machine Learning algorithms such as classification, regression, and clustering techniques	K5,K6
CO5	Evaluate model performance using appropriate metrics and interpret results effectively and Demonstrate awareness of AI tools, real-world applications, and ethical issues in Artificial Intelligence and Machine Learning.	K1, K2

BTL (Bloom's Taxonomy Level) - K1 – Remembering, K2 – Understanding, K3- Applying, K4 – Analyse, K5- Evaluate and K6 – Create

Relationship Matrix – 26CM003													
Course Outcomes	**Programme Outcomes (POs)**						**Programme Specific Outcomes (PSOs)**						**Mean Score of Cos**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**	
CO1	2	2	2	2	1	1	3	2	2	2	1	1	1.75
CO2	2	2	3	2	2	1	3	2	3	2	3	2	2.25
CO3	2	2	3	3	2	1	2	2	1	3	1	1	1.92
CO4	3	2	2	2	3	2	2	3	2	3	2	2	2.33
CO5	3	3	1	2	2	1	2	3	3	3	2	1	2.17
												Total	2.08

Mean Score: 3- High, 2- Medium/Moderate, 1-Low