

**Course Category** : Major Core  
**Course Name** : Introduction to AI & ML  
**Course Code** : UCS1002  
**L-T-P** : 4-0-2  
**Semester** : 1<sup>st</sup>  
**Batch** : 2024-28

### Syllabus

#### Prerequisite:

- None

#### Course Outcomes:

At the end of the course, students will be able to:

<b>CO1</b>	Develop a comprehensive understanding of the foundational principles of artificial intelligence. <b>(K1,K2)</b>
<b>CO2</b>	Demonstrate proficiency in problem-solving methodologies within the realm of artificial intelligence. <b>(K2,K3)</b>
<b>CO3</b>	Understand the fundamental concepts of knowledge representation and inference in AI. <b>(K2)</b>
<b>CO4</b>	Analyze the core principles and algorithms underlying machine learning, illustrating proficiency in distinguishing between different types of learning paradigms. <b>(K4)</b>
<b>CO5</b>	Investigate diverse application areas of artificial intelligence. <b>(K2,K4)</b>

<b>Unit No</b>	<b>Topics</b>	<b>CO No.</b>	<b>No. of Lecture</b>
<b>1</b>	<b>Introduction to AI:</b> Meaning of Artificial Intelligence, Foundations of AI : Philosophy, Mathematics, Economics, Neuroscience, Psychology, Computer Engineering, Control Theory, Linguistics, History of AI and its evolution, Risks and Benefits of AI	<b>1</b>	<b>6</b>
<b>2</b>	<b>Intelligent Agents and Problem Solving:</b> Agents and Environment, Nature of Environment and Agents, Problem solving agent, Search Problems and Solutions, Formulating Problems, Example Problems, Search Algorithms	<b>2</b>	<b>6</b>
<b>3</b>	<b>Knowledge Representation and Inference:</b> Logical Representation, Propositional Logic, First-order logic, Resolution method of theorem proving, Frames, Semantic Networks, Production Rules <b>Applications of AI:</b> Intelligent Automation, Predictive Maintenance, Design Optimization, Personalized solutions,	<b>3,5</b>	<b>6</b>

Unit No	Topics	CO No.	No. of Lecture
4	<b>Introduction to Machine Learning:</b> Machine Learning definition, Types of Problems: Regression and Classification, Types of data, Defining feature vectors and target variable in data, Types of Machine Learning: Supervised learning, Unsupervised Learning, Semi-Supervised Learning, Reinforcement Learning, Machine Learning Pipeline	4	6

#### **Text Books:**

1. Machine Learning, Tom Mitchell, McGraw Hill, 1997.
2. I. Bratko, "Prolog: Programming for Artificial Intelligence", Fourth edition, Addison-Wesley Educational Publishers Inc., 2011.
3. Ethem Alpaydin, "Introduction to Machine Learning", The MIT Press, Third Edition, 2014

#### **Reference Books:**

1. S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach", Prentice Hall, Third Edition, 2009.

#### **Web References:**

1. <https://pll.harvard.edu/course/cs50s-introduction-artificial-intelligence-python>