



CC-309 Introduction to Artificial Intelligence and Machine Learning

Course Title:	Introduction to Artificial Intelligence and Machine Learning
Course Code:	CC-309
Course Credit:	3
Session Per Week:	4
Total Teaching Hours:	40 Hours

AIM

This course introduces students the fundamentals of artificial intelligence and machine learning and how different business and organizations are trying to use it some way or other to build smart systems, quick decision making etc.

LEARNING OUTCOMES

On the completion of the course students will:

1. Understand the role of basic knowledge representation in AI.
2. Learn how to use AI for problem solving.
3. Deduce the use of NLP applications.
4. Understand the concept machine learning and its types.

DETAIL SYLLABUS

Unit-1

10 Hours

Fundamentals of Artificial intelligence and Intelligent Agent

What is AI?

- Acting humanly: The Turing Test approach,
- Thinking humanly: The cognitive modeling approach,
- Thinking rationally: The “laws of thought” approach,
- Acting rationally: The rational agent approach

State of Art (Applications of AI)

Agents and Environments

The Concept of Rationality

The Nature of Environment

The Structure of Agents.

Case Study: Create a new health care market with AI

Unit-2

10 Hours

Problem Solving by searching

Problem-Solving Agents

- Well defined problem and solutions
- Formulating problems

Example Problems

- Toy problems

Searching for Solution

Uninformed Search Strategies

- Concept of BFS
- Concept of DFS
- Depth-limited search
- Iterative deepening DFS
- Bidirectional search

Informed (Heuristic) Search Strategies

- Concept of Greedy BFS
- A* search: Minimizing the total estimated solution cost

Case Study: Applications of AI in transportation.

Unit-3

10 Hours

Natural language processing

Language Models

- N-gram character models
- N-gram word models

Text classification

- Classification by data compression

Information retrieval

- The page rank algorithm
- The HITS algorithm

Information extraction

- Finite state automata for information extraction
- Probabilistic model for information extraction.

Examples: Applications of Natural Language Processing.

Case Study: Automated Voice Assistants, Chat bots.

Unit-4

10 Hours

Machine Learning

Machine Learning in the bigger picture

Areas of machine learning and grades for supervision

Supervised Learning strategies - regression versus classification

Unsupervised problem solving-clustering

Types of Machine Learning:

- Supervised, Unsupervised
- Semi-Supervised Learning
- Reinforcement Learning

How Supervised Learning works.

Why the model works on new data.

Case Study: Recommendation Based Systems, At Microsoft, AI is a Big, Big Deal.

TEXT BOOKS:

- 1) Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig, Third Edition
- 2) Machine Learning for Developers: Claudio Delrieux
- 3) The Hundred-Page Machine Learning Book : Andriy Burkov

REFERENCE BOOKS:

- 1) Artificial Intelligence, 2nd Edition, Rich and Knight
- 2) Machine Learning, Tom M Mitchell
- 3) Artificial Intelligence: A New Synthesis, Nils J. Nilsson

- 4) Artificial Intelligence in the real world, The Economist Intelligence Briefing Paper, Wipro [Case Study]
- 5) Getting Smarter by the day: How AI is elevating the performance of global companies. [Case Study]

WEB RESOURCES:

- 1)https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_quick_guide.htm
- 2)<https://www.geeksforgeeks.org/introduction-to-natural-language-processing/>
- 3)<https://www.geeksforgeeks.org/introduction-machine-learning/>
- 4)<https://www.geeksforgeeks.org/getting-started-machine-learning/>
- 5)<https://www.lanner-america.com/blog/examples-artificial-intelligence-applications-transportation/>
- 6)<https://medium.com/@datamonsters/artificial-neural-networks-in-natural-language-processing-bcf62aa9151a>
- 7)https://www.tutorialspoint.com/machine_learning/index.htm