



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India

DEPARTMENT OF CSE - ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

II Year – I Semester		L	T	P	C
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INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING					

Course Objectives:

- To provide a strong foundation of fundamental concepts in Artificial Intelligence.
- To provide a basic exposition to the goals and methods of Artificial Intelligence.
- To provide fundamentals of machine learning

Course Outcomes:

Upon successful completion of the course, the student will be able to:

- Enumerate the history and foundations of Artificial Intelligence
- Apply the basic principles of AI in problem solving
- Choose the appropriate representation of Knowledge
- Enumerate the Perspectives and Issues in Machine Learning
- Identify issues in Decision Tree Learning

UNIT I

Introduction: What Is AI?, The Foundations of Artificial Intelligence, The History of Artificial Intelligence, The State of the Art, Agents and Environments, Good Behavior: The Concept of Rationality, The Nature of Environments, The Structure of Agents.

UNIT II

Problem Solving: Problem-Solving Agents, Example Problems, Searching for Solutions, Uninformed Search Strategies, Informed (Heuristic) Search Strategies, Local Search Algorithms and Optimization Problems, Searching with Nondeterministic Actions.

UNIT III

Knowledge Representation: Knowledge-Based Agents, Logic, Propositional Logic: A Very Simple Logic, Ontological Engineering, Categories and Objects, Events, Mental Events and Mental Objects, Reasoning Systems for Categories, The Internet Shopping World.

UNIT IV

Introduction to Machine Learning: Well-Posed Learning Problem, Designing a Learning system, Perspectives and Issues in Machine Learning.

Concept Learning and The General-to-Specific Ordering: Introduction, A Concept Learning Task, Concept Learning as Search, FIND-S: Finding a Maximally Specific Hypothesis, Version Spaces and the Candidate Elimination Algorithm, Remarks on Version spaces and Candidate-Elimination, Inductive Bias

UNIT V

Decision Tree Learning: Introduction, Decision Tree Representation, Appropriate Problems for Decision Tree Learning, The Basic Decision Tree Learning Algorithm, Hypothesis Space Search in Decision Tree Learning, Inductive Bias in Decision Tree Learning, Issues in Decision Tree Learning.



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Text Books:

- 1) Stuart Russell and Peter Norvig, “Artificial Intelligence: A Modern Approach” , 3rd Edition, Pearson
- 2) Tom M. Mitchell, *Machine Learning*, McGraw Hill Edition, 2013

Reference Books:

- 1) Saroj Kaushik, “Artificial Intelligence”, Cengage Learning India, 2011
- 2) Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw Hill
- 3) David Poole and Alan Mackworth, “Artificial Intelligence: Foundations for Computational Agents”, Cambridge University Press 2010.
- 4) Trivedi, M.C., “A Classical Approach to Artificial Intelligence”, Khanna Publishing House, Delhi.
- 5) Christopher Bishop, Pattern Recognition and Machine Learning (PRML) , Springer, 2007.
- 6) ShaiShalev-Shwartz and Shai Ben-David, Understanding Machine Learning: From Theory to Algorithms (UML) , Cambridge University Press, 2014.

Web Resources:

- 1) <https://nptel.ac.in/courses/106105077>
- 2) <https://nptel.ac.in/courses/106106126>
- 3) <https://aima.cs.berkeley.edu>
- 4) https://ai.berkeley.edu/project_overview.html
- 5) <http://www.zuj.edu.jo/download/machine-learning-tom-mitchell-pdf/>
- 6) <http://www.ntu.edu.sg/home/egbhuang/pdf/ieee-is-elm.pdf>
- 7) https://swayam.gov.in/nd1_noc20_cs73/preview