

B.Tech III Year I Semester

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS) PULIVENDULA

19AEC54c- ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS

(Professional Elective-I)

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Course Objectives: The objectives of the course are to make the students learn about

- To learn the differences between structure of agents & problem solving agents.
- To solve problems with uniformed search strategies & Heuristic search.
- To be able to solve Inference in first order logic.
- To understand the development of Neural Networks with basic principles.
- To acquire knowledge on Feed forward & Feedback Neural Networks.

UNIT – I:

Introduction: AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

Learning Outcomes:

At the end of this unit, the student will be able to

- Gain knowledge on basics and problems of Artificial Intelligence. **L1**
- Analyze the concept of rationality and structure of problem solving agents. **L4**

UNIT – II:

Searching: Searching for solutions, uniformed search strategies – Breadth first search, depth first Search. Search with partial information (Heuristic search), Knowledge Representation & Reasons logical Agents, Knowledge – Based Agents, the Wumpus world, logic, propositional logic, reasoning patterns in propositional logic, Resolution, Forward & Backward Chaining.

Learning Outcomes:

At the end of this unit, the student will be able to

- Know how to search for solutions using knowledge based agents. **L1**
- Analyze reasoning patterns in propositional logic, Forward and Backward Chaining. **L4**

UNIT – III:

First Order Logic : Inference in first order logic, propositional Vs. first order inference, unification & lifting forward chaining, Backward chaining, Resolution.

Learning Outcomes:

At the end of this unit, the student will be able to

- Gain knowledge on Inference concept present in first order logic. **L1**
- Analyze the differences between propositional & first order inference. **L4**

UNIT – IV:

Characteristics Of Neural Networks : Historical Development of Neural Networks Principles, Artificial Neural Networks: Terminology, Models of Neuron, Topology, Basic Learning Laws, Pattern Recognition Problem, Basic Functional Units, Pattern Recognition Tasks by the Functional Units.

Learning Outcomes:

At the end of this unit, the student will be able to

- Articulate the structure of Artificial Neural Networks with working principles.(L3) **L1**
- Identify the importance of models of Neuron, topology & basic learning laws.(L1) **L2**

UNIT – V:

10 Hrs

Feedforward Neural Networks: Introduction, Analysis of pattern Association Networks, Analysis of Pattern Classification Networks, Analysis of Pattern Mapping Networks.

Feedback Neural Networks:

Introduction, Analysis of Linear Auto associative FF Networks, Analysis of Pattern Storage Networks.

Learning Outcomes:

At the end of this unit, the student will be able to

- Differentiate Feed forward Neural Networks & Feedback Neural Networks.(L4) **L1**
- Analyze the Pattern Association, Classification & Mapping Networks.(L4) **L2**

Text Books:

1. Stuart Russel and Peter Norvig, “Artificial Intelligence – A Modern Approach”, Second Edition, PHI/ Pearson Education.2009.
2. B. Yagna Narayana, “Artificial Neural Networks”, PHI, 2006.

Reference Books:

1. E.Rich and K.Knight, “Artificial Intelligence”, 2nd Edition, Tata Mc Graw Hill,
2. Simon Haykin, “Neural Networks”, PHI, 2009

Course Outcomes:

At the end of this Course the student will be able to

- Contrast the differences between structure of agents & problem solving agents. **L4**
- Solve problems with uniformed search strategies & Heuristic search. **L3**
- Analyze the problems of inference in first order logic. **L4**
- Understand the development of Neural Networks with basic principles. **L2**
- Acquire knowledge on Feed forward & Feedback Neural Networks. **L1**

