

**M.Tech(IT) : Second Semester**  
**Paper Code: MT22**  
**Paper Name: Artificial Intelligence and Neural Network**

**Syllabus**

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**1. Basics of Artificial Intelligence**

Introduction to AI, AI Techniques, Knowledge Representation, Approaches to Knowledge Representation, Issues in knowledge representation, Application areas: Image understanding, Signature Analysis, Robotics, Expert System, Application area of Expert System, Intelligent Control and Scheduling.

**2. Problem, Problem Space and Search**

Search and Control Strategies, Preliminary Concepts, Water Container Problem, Production System, Problem Characteristics, Means-end analysis, Problem Reduction, Uninformed or Blind Search, Informed Search, Hill Climbing Methods, Best First Search, A\* Algorithm

**3. Basics of Artificial Neural Networks, Synaptic Dynamics**

Artificial Neural Networks: Terminology, Models of Neuron, Topology, Activation Dynamics Models, Synaptic Dynamics Models, Stability and Convergence, Pattern Recognition Problem, Pattern Recognition Tasks by the Functional Units.

**4. FeedForward & FeedBack Neural Networks**

Analysis of Pattern Association Networks, Analysis of Pattern Classification Networks, Analysis of Pattern Mapping Networks, Analysis of Linear Autoassociative FF Networks, Analysis of Pattern Storage Networks, Stochastic Networks and Simulated Annealing, Boltzmann Machine

**5. Competitive Learning Neural Networks**

Components of a Competitive Learning Network, Analysis of Feedback Layer for Different Output Functions, Analysis of Pattern Clustering Networks, Analysis of Feature Mapping Network, Associative Memory, Pattern Mapping, Stability Plasticity Dilemma:ART, Temporal Patterns, Pattern Variability: Neocognitron.

**Reference Books:-**

- 1) B. Yegnanarayana, "Artificial Neural Network", Prentice-Hall of India.
- 2) S. Russel and P. Norvig, "Artificial Intelligence, A Modern Approach", Prentice-Hall of India.
- 3) E. Rice and K. Knight, "Artificial Intelligence", Tata McGrawHill.