EEPC1T6A   **AI TECHNIQUES**   **Credits: 4**

(ELECTIVE-II)

Lecture: 4 periods/week   **Internal assessment: 30 marks**

Semester end examination: 70 marks

Objectives:
- To introduce the fundamental concepts of artificial intelligence.
- To explore the different paradigms in knowledge representation and reasoning;
- To understand the contemporary techniques in machine learning;
- To evaluate the effectiveness of hybridization of different artificial intelligence techniques.

Learning Outcomes:
- Understand the history, development and various applications of artificial intelligence;
- Learn the knowledge representation and reasoning techniques in rule-based systems, case-based systems, and model-based systems;
- Appreciate how uncertainty is being tackled in the knowledge representation and reasoning process, in particular, techniques based on probability theory and possibility theory (fuzzy logic);
- Master the skills and techniques in machine learning, such as artificial neural networks, and genetic algorithm;

Unit – I: Introduction to Neural Networks
Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models. introduction-neural network models-architectures-knowledge representation-learning process-learning tasks.

Unit- II: Feed Forward Neural Networks
Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications.

Unit–III: ANN paradigm-back propagation-RBF algorithms-Hope field networks

Unit IV : Genetic Algorithms-introduction-encoding-fitness function-reproduction operators

Unit V: Genetic modeling-genetic operators-cross over and mutation-generational cycle-convergence of genetic algorithm-

Unit – VI: Classical AND Fuzzy Sets
Introduction to classical sets - properties, Operations and relations; Fuzzy sets,   Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

UNIT VII: Fuzzy Logic System Components
Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

UNIT VIII: APPLICATION OF AI TECHNIQUES-load forecasting-load flow studies-economic load dispatch-load frequency control-reactive power control-speed control of dc and ac motors

TEXT BOOK:
1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications by Rajasekharan and Rai – PHI   Publication.
2. Introduction to Artificial Neural Systems - Jacek M. Zuarda, Jaico Publishing House, 1997.