ARTIFICIAL INTELLIGENCE
EE-705B
Credit: 3
Contact: 3L

Module 1
Introduction:
Intelligent Agents – Agents and environments - Good behavior – The nature of environments – structure of agents - Problem Solving - problem solving agents – example problems – searching for solutions – uniformed search strategies - avoiding repeated states – searching with partial information.   [06]

Module 2
Searching techniques:
Informed search and exploration – Informed search strategies – heuristic function – local search algorithms and optimistic problems – local search in continuous spaces – online search agents and unknown environments - Constraint satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems - Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision – games that include an element of chance.   [09]

Module 3
Knowledge representation:
First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects.   [09]

Module 4
Learning:
Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data - Learning with hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.   [09]

Module 5
Applications:
Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction - Probabilistic language processing - Probabilistic language models – Information retrieval – Information Extraction– Machine translation.   [07]

Text Books:
1. Artificial Intelligence – A Modern Approach", Stuart Russell, Peter Norvig, 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

Reference Books:
1. Artificial Intelligence: A new Synthesis, Nilsson. J. Nils , Harcourt Asia Pvt. Ltd., 2000.
2. Artificial Intelligence, Rich Elaine & Knight Kevin, 2nd Edition, Tata McGraw-Hill, 2003.
3. Artificial Intelligence-Structures and Strategies for Complex Problem Solving, Geogre F. Luger, Pearson Education / PHI, 2002