

Introduction: Overview – AI problems, AI techniques, Tic – Tac – Toe problem, problem characteristics, problem systems, problem solving by search- Beyond Classical Search - Adversarial Search, constraint satisfaction problems.

Knowledge Representation: Procedural Vs Declarative Knowledge, Representations & Approaches to Knowledge Representation, Forward Vs Backward Reasoning, Matching Techniques, Logic Based Programming- AI Programming languages: Overview of LISP, Search Strategies in LISP, Pattern matching in LISP. Knowledge Acquisition and Validation Techniques, Black Board Architecture, Knowledge Building System Tools, Expert System Shells, Fuzzy Expert systems.

Reasoning under Uncertainty: Non-Monotonic Reasoning, Truth Maintenance Systems, Logics for Non-Monotonic Reasoning. Statistical Reasoning: Bayes Theorem, Certainty Factors and Rule-Based Systems, Quantifying Uncertainty -Probabilistic Reasoning - Probabilistic Reasoning over Time. Bayesian Networks, Dempster-Shafer Theory, Fuzzy Logic: Crisp Sets, Fuzzy Sets, Fuzzy Logic Control, Fuzzy Inferences & Fuzzy Systems.

AI in Supply Chain: Understanding decision points, influence on managerial activities, Experts Systems: Overview of an Expert System, Structure of an Expert Systems, Different Types of Expert Systems- Rule Based, Model Based, Case Based and Hybrid Expert Systems. Decision models- classification. Intelligent/ smart manufacturing – planning and production activities, performance evaluation, predictive analysis, digital manufacturing, preventive and predictive maintenance.

#### TEXT BOOKS/ REFERENCES:

1. Elaine Rich, Kevin Knight, and Shivashankar B Nair, *Artificial Intelligence*, Third Edition, Tata McGraw Hill Education Private Limited, 2009.
2. Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach*, Third Edition, Pearson Education, Inc., 2010.
3. George F Luger, *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*, Fifth Edition, Pearson Education Limited, 2005.
4. George F Luger, *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*, Sixth Edition, Pearson Education, Inc., 2009.
5. W. K. Wong, Z. X. Guo and S. Y. S. Leung, *Optimizing decision making in the apparel supply chain using artificial intelligence (AI) From production to retail*, First Edition, Woodhead Publishing Limited, 2013.