

## MT 437      MACHINE INTELLIGENCE (ELECTIVE - IV)

**Course Description & Objectives:**

*This course strives to emphasize important unifying themes that occur throughout many areas of AI research by taking advantages of recent exciting multidisciplinary advances in understanding and modeling the brain.*

**Course Outcomes:**

*On completion of this course, students would be able to:*

- 1. familiarize with artificial intelligence and symbolic logic*
- 2. acquire knowledge about acquisition and representation*
- 3. learn reasoning and KRR system as well as learn use of uncertainty*

**UNIT I: Overview of Artificial Intelligence:**

Introduction, History, Applications, Objectives, Programming, Criticism, Future

**UNIT II: Symbolic Logic:**

Introduction, Logic, Propositions, Normal Forms in Propositional Logic, Logical Consequences, Resolution Principle, Predicate Calculus, Well-Formed Formulas (WFFs), Clausal Form, Rules of Inference, Unification, Resolution, Rule-Based Expert Systems, The Prolog Language.

**UNIT III: Knowledge Acquisition and Representation:**

Introduction, Machine Intelligence, Knowledge Engineering, Procedure for Knowledge Acquisition, Knowledge Representation, Logical Representation Schemes, Procedural Representation Schemes, Network representation Schemes, Structured Representation Schemes.

**UNIT IV: Reasoning and KRR Systems:**

Introduction, Reasoning, Knowledge Representation and Reasoning (KRR) System, Knowledge Representation (KR) Languages, Domain Modeling, Semantic Nets (Associative Networks), Reasoning Systems, Frame Based Systems, Hybrid Representation Systems.

**UNIT V: Uncertainty:**

Introduction, Non-monotonic and Monotonic Reasoning, Confidence Factor, Bayes Theorem, Theory of Evidences, Non-classical Logics, Default Logic, Bayesian Networks, Fuzzy Logic, Problem Representation, Definitions, Representation Schemes, Problem Solving in AI, Blind Search Techniques, Heuristic Search Techniques, Game Searches.

**TEXT BOOK :**

1. Rajendra Akerkar, "Introduction to Artificial Intelligence", Prentice Hal

India, 2005.

**REFERENCES :**

1. Stuart Russell, Peter Norvig, "Artificial Intelligence - A Modern Approach", 2nd ed., Prentice Hall India, 2008.
2. Kevin L. Priddy, Paul E. Keller, "Artificial Neural Networks An Introduction", Prentice Hall India, 2007.

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## MT 439      LEAN MANUFACTURING (ELECTIVE -IV)

**Course Description & Objectives:**

*This course helps students understanding all good manufacturing and management practices for improving productivity of a typical manufacturing industry.*

**Course Outcomes:**

*On completion of this course, students would be able to:*

1. *understand lean production and its importance*
2. *acquire knowledge about different processes for lean production*
3. *familiarize with TPM and employee involvement in industries*

**UNIT I: Lean Production:**

Introduction, background, lean thinking, Importance of lean production philosophy, strategy, culture, alignment, focus and systems view, Discussion of Toyota Production System.

**UNIT II: Lean Production Processes:**

Lean production preparation, System assessment, Process and value-stream mapping, Sources of waste, Lean production processes, Approaches and techniques.—Importance of focusing upon flow.

**UNIT III: Lean Manufacturing Tools:**

Workplace organization, 5S, Stability, Just-In-Time, One piece flow, Pull, Cellular systems, Quick change and set-up reduction methods.

**UNIT IV: Total Productive Maintenance:**

Poka-Yoke, mistake proofing, quality improvement, Standards, Leveling, Visual management.

**UNIT V: Employee Involvement:**

Teams, Training, Supporting and encouraging involvement, Involving people in the change process, communication, Importance of culture. **Case studies:** Startup of lean processes and examples of applications, Sustaining improvement and change, auditing, follow-up actions.