Introduction to Artificial Intelligence

Syllabus: Unit 3: Knowledge Representation And Reasoning [15Hrs]

- 3.1 Definition and importance of Knowledge, Issues in Knowledge Representation, Knowledge Representation Systems, Properties of Knowledge Representation Systems, Types of Knowledge, The Role of Knowledge
- 3.2 Knowledge representation techniques: Rule Based, Semantic Nets, Frames, Logic based
- 3.3 Propositional Logic, Syntax and Semantic of propositional logic, Proof by Resolution, Conjunctive Normal Form (CNF), Resolution Algorithm, Limitations of Propositional Logic, Forward and Backward Chaining
- 3.4 Predicate Logic, FOPL, Syntax, Semantics, Quantification, horn clauses, Inference with FOPL: By converting into PL (Existential and universal instantiation), Rules of inference, Unification and lifting, CNF for FOP L, Inference using resolution, Resolution Refutation System (RRS)
- *3.5 Handling Uncertain Knowledge, Random Variables, Prior and

History of Knowledge based System and Expert System

- DENDRAL: infer molecular structure from mass spectrometry
- MYCIN: diagnose blood infections and recommend antibiotics
- XCON: convert customers orders into parts specification

Knowledge is not deterministic rules, need to model uncertainty. Requires considerable manual effort to create rules, hard to maintain.