# 20AD41E9 - KNOWLEDGE REPRESENTATIONS AND REASONING

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| Course Category: | Professional Elective | Credits: | 3 |
| Course Type: | Theory | Lecture-Tutorial-Practical: | 3-0-0 |
| Prerequisite: | Knowledge of basic computer programming  Knowledge of basic mathematical concept. Students must have taken the introductory course in artificial intelligence | Sessional Evaluation:  Univ. Exam Evaluation:  Total Marks: | 40  60  100 |
| Objectives: | * Understand the area of knowledge representations and reasoning in artificial intelligence * To study various Concepts of knowledge representations, processes, contexts and knowledge soup | | |

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| Course Outcomes | Upon successful completion of the course, the students will be able: | |
| CO1 | To identify basic key concepts that explores representing knowledge in logic |
| CO2 | To recognize the different ontological categories. |
| CO3 | To apply Knowledge Representation in Engineering |
| CO4 | To demonstrate what are processes. |
| CO5 | To identify the syntax and semantics of contexts. |
| CO6 | To recognize different type of logic and their limitations. |
| Course Content | UNIT-I  **Logic:** Historical background, Representing knowledge in logic, Varieties of logic, Name, Type, Measures**.**  UNIT-II  **Ontology:** Ontological categories, Philosophical background, Top-level categories, Describing physical entities, Defining abstractions, Sets, Collections, Types and Categories, Space and Time.  UNIT-III  **Knowledge Representations:** Knowledge Engineering, Representing structure in frames, Rules and data, Object-oriented systems, Natural language Semantics.  UNIT-IV  **Processes:** Times, Events and Situations, Classification of processes, Procedures, Processes and Histories, Concurrent processes, Computation, Constraint satisfaction, Change.  UNIT-V  **Contexts:** Syntax of contexts, Semantics of contexts, First-order reasoning in contexts, Modal reasoning in contexts, Encapsulating objects in contexts.  UNIT-VI  **Knowledge Soup:** Vagueness, Uncertainty, Randomness and Ignorance, Limitations of logic, Fuzzy logic, Nonmonotonic Logic, Theories, Models and the world, Semiotics. | |
| Text Books &  Reference  Books | **TEXT BOOKS:**   1. Knowledge Representation logical, Philosophical, and Computational Foundations by John F. Sowa, Thomson Learning.   **REFERENCE BOOKS:**   1. Knowledge Representation and Reasoning by Ronald J. Brachman, Hector J. Levesque, Elsevier. | |
| E-Resources | 1. <https://vdoc.pub/download/knowledge-representation-logical-philosophical-and-computational-foundations-6d93tm4iv4j0> 2. <https://onlinecourses.nptel.ac.in/noc20_cs30/preview> 3. <https://freevideolectures.com/university/iitm> | |