Course-Plan

School	**Engineering**
Department	**Computer Sc. & Engineering**
Course Code	
Course Name	**Knowledge Representation and Reasoning**
Instructor	**Prof. Shyamanta M Hazarika**

Abstract

Knowledge Representation and Reasoning is at the very core of understanding intelligence. Instead of trying to understand or build intelligent agents from the bottom up, its goal is to understand and build intelligent behaviour from the top down. Focus is on what an agent needs to know in order to behave intelligently, how this knowledge can be represented symbolically, and how automated reasoning procedures can make this knowledge available as needed. This course covers the central concepts of such representation and reasoning formalisms developed over the last five decades.

Objectives

1. Understand the basic principles of knowledge representation and reasoning and appreciate its power and its limitations.
2. Analyse informal descriptions of problems and real world situations in terms of different formal representation languages.
3. Learn use of automated reasoning tools and techniques to compute inferences from logical representations.

Prerequisites of the course

1. Basic knowledge in the area of AI
2. Basic knowledge in formal logic
3. Basic knowledge in theoretical computer science

Lecture Plan

Tentative Lecture	Topics
1	Introduction
2-4	First-order Logic
5-7	Expressing Knowledge
8-10	Resolution
11	Horn Clauses
12-14	Procedural Representations
15	Production Systems
16	Frames
17-20	Description Logics
21-22	Inheritance
23-24	Defaults
25-27	Probabilities
28-31	Explanation and Diagnosis

32-36	Action and Change
37	Planning
38-40	Expressiveness / Tractability
41	Course Summary

Evaluation Plan

Evaluation would be based on

1. Assignments 35 %
   Three Problem Sets

2. MidTerm / EndTerm 65 %
   Only written Examination
   Time and Venue to be declared

Pedagogy

Teaching-learning methods to be used
- Lecture and Discussion
- Presentations
- Quiz

Expected outcome

1. Acquire skills in representing knowledge for different domains
2. Understanding the principles behind different knowledge representation and reasoning techniques
3. Being able to read and understand research literature in the area of KR&R

Syllabus and Suggested readings

The recommended text for the course is

Knowledge Representation and Reasoning by Brachman and Levesque Morgan Kaufmann Publishers, ISBN 1-55860-932-6.

For further details including suggested reading and Lecture slides please visit the web-site for the course

http://tezu.ernet.in/~smh/krr