RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, VII-Semester

Departmental Elective CSIT- 702 (C) Semantic Web & Service Oriented Architecture

Objective:

1.To Introduce Semantic Web Vision
2.Understanding about XML,RDF,RDFS,OWL
3.Querying Ontology
4.Ontology Reasoning
5.Migration from Document to Data Web

Course Outcomes:

1.Understand the semantic web Vision and technologies
2.Understand about ontology
3.Understanding about Data Web(Linked opendata Cloud)

UNIT-I

Semantic Web: Building Models , Calculating with knowledge, Exchanging Information, Semantic Web Technologies ,Types of Web :Smart Web & Dumb Web, Applications ,Semantic Data ,Search Engine for Semantic Web

UNIT-II

Semantic Modeling: Modeling for human communication, Explanation and prediction, Mediating Variability: Variation & Classes, Variation & Layers, Expressivity in Modeling.

UNIT-III

Resource Description Language RDF : Introduction , Advanced features , simple ontologies in RDF Schema , encoding of special data structures, RDF formal semantics ,syntactic reasoning with deduction rules ,Distributing data across web , Managing data from multiple sources .

UNIT-IV

Web Ontology Language OWL : OWL syntax and Intuitive semantics , OWL species , Owl formal semantics : Description Logics , Model-Theoretic Semantics of OWL, Automated reasoning with OWL ,Ontology Matching and Distributed Information .

UNIT-V

Semantic Web Application Architecture: RDF Parser/Serializer, RDF store: RDF data standards and Interoperability of RDF stores , RDF query engines , SPARQL: Query language for RDF , conjunctive Queries for OWL DL ,RDF backed web portals , Data federation .

Ontology Engineering: Constructing Ontologies manually, Reusing Existing Ontologies,
Semiautomatic Ontology Acquisition, Ontology Mapping

Recommended Books:

1. Hitzler, Markus, Rudolph , " Foundations of Semantic Web Technologies" , Chapman & Hall/CRC,2009,ISBN 9781420090505
2. Allemang , Hendler , " Semantic Web for the working Ontologist" 2nd ed. Elsevier Pub
3. Liang Yu , " Introduction to the Semantic Web and Semantic Web Services", Chapman & Hall/CRC
4. Antoniou , Harmelen , "A semantic Web Primer", PHI Pub.
5. Rajendra Akerkar ," Foundations of Semantic Web" , Narosa Publishing ,NewDelhi

List of Experiments:

1. Working with XML
2. Working with XML Schema, DTD
3. Design of Ontology using RDF
4. Design RDF document with different Serialization format (e.g. tutle,N-triple)
5. Design of Ontology using RDFS
6. Design of Ontology using OWL
7. Case study : Pizza Ontology
8. Querying Ontology using SPARQL
9. Case Study : Dbpedia
10. Case study : LOD Cloud