CS8107 Information & Web Semantics (3 Credit Hours)

Course Description:

The Semantic Web is concerned with how to characterize web content, web services and web agents to enable greater automation, integration and reuse across applications. This course introduces core topics of the Semantic Web, goes into depth on the technologies underlying it, and considers how the Semantic Web stands to affect everyday life. This course is aimed to give students a detailed understanding of the principles and practices underlying the Semantic Web and to equip them with knowledge engineering skills.

Course Objectives:

- Understand the limitations of the current web in different scenarios
- Know about the enabling technologies of the Semantic Web
- In-depth knowledge of the application of these technologies
- Understand and use the tools developed in the field of web semantics
- Understand how more automation is achieved by adding semantics to web services

Course Contents:

Introduction to Semantic Web

The Syntactic Web, The Semantic Web, Working of the Semantic Web, Scope and Boundaries of the Semantic Web, Effects of the Semantic Web on Person, Business, Education and Government

Semantic Web Concepts

Ontologies, Taxonomy, Thesauri and Ontologies, Ontology Classification, Ontology Evolution, Merging, Alignment, Ontology Description Languages, Knowledge Representation in Description Logic, RDF and RDF Schema, OWL, Rule Languages, Semantic Web Services

Semantic Web Technologies

Methods for Ontology Development, Ontology Sources: Dublin Core, vCard, FOAF, Wordnet, CYC, SUMO, Other Ontologies, Ontology Libraries, Semantic Web Software Tools: Ontology Editors, Triple Storage Systems, Reasoners, SW Development Toolkits, Other Tools, SW Projects

Semantic Web Applications

Semantic Desktop: Metadata, Ontologies, Related Applications

Software Agents: Forms, Architecture, Communication in Semantic Web

Other Applications: Art, Geospatial Semantic Web etc

Recommended Readings:

- Karin K. Breitman, Morco A. Casanova, and Walter Truszkowski, Semantic Web: Concepts, Technologies, and Applications, Springer-Verlag, 2007.
- Grigoris Antoniou and Frank van Harmelen, A Semantic Web Primer, MIT Press, 2004.
- John Davies, Rudi Studer and Paul Warren, Semantic Web Technologies: Trends and Research in Ontology-based Systems, John Wiley & Sons, 2006.
- Raj Sharman, Rajiv Kishore and Ram Ramesh, ONTOLOGIES: A Handbook of Principles, Concepts and Applications in Information Systems, Springer, 2007.