

The World Wide Web - Limitations of Today's Web – The Next Generation Web – Semantic Web - Layers – Semantic Web technologies – Semantics in Semantic Web – XML: Basics – Well-formed and valid Documents – Namespaces - XML schema – Addressing – Querying - Document Object Model (DOM) – XML Applications – XML limitations.

RDF Basic Ideas - RDF Specification – RDF Syntax: XML and Non- XML – RDF elements – RDF relationship: Reification, Container, and collaboration – RDF Schema – Editing, Parsing, and Browsing RDF/XML – Discovering Information – Querying (RQL, SPARQL) – Web Ontology Language (OWL) - Classes, Instances and Properties in OWL - Complex Classes - Property Restrictions - Role Inclusion.

Ontology - Ontology Types – Logic - Description Logics - Rules - Inference and Reasoning - Ontology Engineering : Introduction – Constructing ontologies – Tools used in building and storing ontologies (Sesame, Jena, Protégé, NeOn) – Reusing ontologies – ontology reasoning (RACER). The web of data - Data on the web - shallow and deep web - Linked open data - linked data principles - Linked data design - Publishing linked data - Consuming and aggregating linked data.

TEXTBOOKS/ REFERENCES:

1. Paul Groth, Frank van Harmelen, Rinke Hoekstra, “A Semantic Web Primer”, 3rd edition, MIT press, 2012.
2. Gómez-Pérez, A. Fernández-López, M. Corcho, O. Ontological Engineering. Springer Verlag 2003.
3. Michael C. Daconta, Leo J. Obrst, Kevin T. Smith, “The Semantic Web: A Guide to the Future of XML, Web Services, and Knowledge Management”, Fourth Edition, Willey Publishing, 2003.
4. John Davies, Rudi Studer, Paul Warren , “semantic web technologies: Trends and Research in ontology-based systems”, Wiley & Sons (July 11, 2006).