

Course code	Course Name	L-T-P-Credits	Year of Introduction
IT463	Semantic Web	3-0-0-3	2016

Prerequisite : Nil

Course Objectives

- To introduce semantic web technologies and semantic web architecture
- To study the use of XML in Semantic Web
- To Explore RDF and OWL
- To introduce Logic and Inference
- To study ontology engineering
- To analyse semantic web applications.

Syllabus

The Semantic Web Vision, Today's Web, From Today's Web to the Semantic Web: Examples, Semantic Web Technologies, A Layered Approach, Structured Web Document in XML, The XML Language, Structuring, Namespace, Addressing and Querying XML Documents, Processing, Describing Web Documents in RDF, RDF: XML-Based Syntax, RDF Schema, An Axiomatic Semantics for RDF and RDF Schema, A Direct Inference System for RDF and RDFS, Querying in RQL, Web Ontology Language(OWL), Examples, OWL in OWL, Future Extensions, Logic and Inference, Example of Monotonic Rules: Family Relationships, Monotonic Rules Syntax and Semantics, Nonmonotonic Rules: Motivation, Syntax and Example, Rule Markup in XML, Applications, Ontology Engineering, Constructing Ontologies Manually, Reusing Existing Ontologies, Using Semiautomatic Methods, On-To-Knowledge Semantic Web Architecture.

Expected Outcome

- Conceptual understanding of the above topics and ability to apply them in practical situations.

References

1. Grigoris Antoniou, Frank Van Harmelon, "A Semantic Web Primer", The MIT Press.
2. J. Davies, D. Fensel, and F. van Harmelen. Towards the Semantic Web: Ontology-Driven Knowledge Management, New York, Wiley, 2003.
3. Natalya. F. Noy and Deborah L. McGuinness, Ontology Development 101: A Guide to Creating Your First Ontology,
http://protege.stanford.edu/publications/ontology_development/ontology101.pdf

COURSE PLAN

Module	Contents	Hours	Sem. Exam Marks
I	The Semantic Web Vision, Today's Web, From Today's Web to the Semantic Web: Examples, Semantic Web Technologies, A Layered Approach, Structured	4	15%

COURSE PLAN			
Module	Contents	Hours	Sem. Exam Marks
	Structured Web Document in XML, The XML Language, Structuring, Namespace, Addressing and Querying XML Documents, Processing	5	
II	Describing Web Documents in RDF, RDF: XML-Based Syntax, RDF Schema, An Axiomatic Semantics for RDF and RDF Schema, A Direct Inference System for RDF and RDFS, Querying in RQL	6	15%
FIRST INTERNAL EXAM			
III	Web Ontology Language(OWL), Examples, OWL in OWL, Future Extensions	6	15%
IV	Logic and Inference: Rules, Example of Monotonic Rules: Family Relationships, Monotonic Rules Syntax and Semantics, Nonmonotonic Rules: Motivation, Syntax and Example, Rule Markup in XML	6	15%
SECOND INTERNAL EXAM			
V	Applications: Horizontal Information Products at Elsevier, Data Integration at Audi, Skill Finding at Swiss Life, Think Tank Portal at EnerSearch, e-Learning, Web Services	9	20%
VI	Ontology Engineering, Constructing Ontologies Manually, Reusing Existing Ontologies, Using Semiautomatic Methods, On-To-Knowledge Semantic Web Architecture, Key Research challenges in Semantic Web	6	20%
END SEMESTER EXAM			

QUESTION PAPER PATTERN

Maximum Marks: 100

Exam Duration: 3 hours

The question paper shall consist of Part A, Part B and Part C.

Part A shall consist of three questions of 15 marks each uniformly covering Modules I and II. The student has to answer any two questions (15×2=30 marks).

Part B shall consist of three questions of 15 marks each uniformly covering Modules III and IV. The student has to answer any two questions (15×2=30 marks).

Part C shall consist of three questions of 20 marks each uniformly covering Modules V and VI. The student has to answer any two questions (20×2=40 marks).

Note : Each question can have a maximum of 4 subparts, if needed