

GUJARAT TECHNOLOGICAL UNIVERSITY

COMPUTER ENGINEERING (SOFTWARE ENGINEERING) (02)

SEMANTIC WEB

SUBJECT CODE: 2740204

M.E. 4TH SEMESTER

Type of course: Elective

Prerequisite: Preliminary knowledge of XML.

Rationale: The Web was originally designed with a goal to support not only human-human communication but also as one that would enable automated machine processing of data with minimal human intervention. The rationale behind such a system is that most of the data currently posted on the web is buried in HTML files suitable for human reading and not for computers to manipulate meaningfully. The semantic Web, an extension of the current web, can be thought of as a globally linked database where information is given well-defined meaning using metadata for better enabling computers and humans to work in close co-operation. The realization of a Semantic Web will thus make machine reasoning more powerful, creating an environment where intelligent software agents can roam, carrying out sophisticated tasks for their users.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	ESE (V)		PA (I)			
					ESE	OEP	PA	RP		
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Semantic Web Vision: Today's web, Examples of semantic web from today's web, Semantic web technologies, layered approach	3	10
2	Structured web documents in XML: The XML language, Structuring, Namespaces, Querying and Addressing XML documents, Processing	7	15
3	Describing Web Resources: Introduction, RDF, RDF Schema syntax and language, Direct Inference System, Querying RQL	7	15
4	Web Ontology Language: Introduction, OWL language, Examples, OWL in OWL, Future extensions	7	15
5	Logic and Inference: Rules: Introduction, Monotonic Rules syntax, semantics & examples, Nonmonotonic rules – syntax & examples, Encoding in XML	6	15
6	Applications: Introduction, Horizontal Information Products at Elsevier, Data Integration at Audi, Skill Finding at Swiss Life, Think Tank portal at EnerSearch, e-Learning, Web Services, Other Scenarios	5	12
7	Ontology Engineering:	5	12

	Introduction, Manual construction of Ontology, Reusing existing ontology, using Semi-automatic methods, Knowledge semantic web architecture		
8	Conclusion and Outlook: How it fits together?, Issues and future trends	2	6

Reference Books:

1. A Semantic web Primer: Grigoris Antoniou and Frank Van Hermelen , MIT Press
2. Foundations of Semantic Web Technologies, Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, CRC Press
3. Semantic Web programming, John Hebler et.el, Wiley

Course Outcome:

After learning the course the students should be able to:

1. Understand Semantic web
2. Creating structured web documents in XML
3. Describe web resources
4. Understand and use WOL
5. Understand & apply ontology engineering to various problems.

List of Tutorials:

Tutorials based on content such as XML document, RDF document preparation, OWL ontology etc.

Major Equipment: Laptop , Open Source Software

List of Open Source Software/learning website:

<http://www.linkeddatatools.com/>
<http://opensemanticframework.org/>
<https://jena.apache.org/>

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.