University of Jordan

King Abdullah II for Information Technology

Business Information Technology Department

Course: Web Semantic (1904701)

Credit: 3 Credit hours

Semester and Year: 1st semester 2014/2015

Instructors	Office hours	Office Phone	E-Mail
Dr. Hossam Faris	Su, Tu and Th 12:00 – 1:00	22634	hossam.faris@ju.edu.jo

Course Description

This course is intended to introduce the core concepts of the Semantic Web that promises to dramatically improve the current World Wide Web and its use. The main goal of the Semantic Web is to enhance the human and machine interaction by representing the data in an understandable way for the machine to mediate data and services. Semantic web covers many technologies like explicit metadata, Ontologies, RDF, OWL, logic and inferencing for search query formulation, and intelligent agents. The course concerns about search on the Semantic Web by covering discovery of knowledge via taxonomies, Web service based data searches and search by association. The course will cover the following Query Languages (xquery, RQL SERQL, SPARQL).

Learning Outcomes

Upon completion of the course, students will be able to:

- Understand the basic concepts and principles of different theoretical models of the semantic web technologies and and assess their applicability to some specific domains.
- Understand the concepts of metadata, semantics of knowledge and resource, graph-based RDF models, RDF Schema, ontologies, and their descriptions in XML-based syntax and web ontology language (OWL).
- Be able to describe, build, analyze, edit and query Ontologies.
- Use ontology engineering approaches in semantic applications
- Be able to design and program domain specific semantic applications.

Course Outline:

Week 1	The Semantic Web Vision.
Week 2	XML.
Week 3	Ontology Foundation.
Week 4	Resource Description Framework (RDF). (Basic Ideas, RDF: XML-Based Syntax (Serializing RDF to XML), Reification, Containers, and Collections, RDF Schema)
Week 5	Querying RDF in SPARQL
Week 6	Web Ontology Language (OWL).
Week 7	Ontology Design and Management using the Protege editor.
Week 8	Midterm Exam
Week 9	Ontology Reasoning with Pellet.
Week 10	Ontology Querying with SPARQL.
Week 11	Ontology Programming with the Jena API.
Week 12	Ontology Applications.
Week 13	Intelligent Web. Algorithms for Search, Recommendation, Grouping & Classification
Week 14	Research course paper discussion.
Week 15	Research course paper discussion.
Week 16	Final Exam.

Elementary Text Books

Grigoris Antoniou and Frank van Harmelen. 2012. ***A Semantic Web Primer***, 3rd Edition (Cooperative Information Systems). The MIT Press.

Karin Breitman, Marco Antonio Casanova, and Walt Truszkowski. 2006. ***Semantic Web: Concepts, Technologies and Applications*** (NASA Monographs in Systems and Software Engineering). Springer-Verlag New York, Inc., Secaucus, NJ, USA.

Supporting Text Books and material

Powers, Shelley. Practical RDF: ***Solving Problems with the Resource Description Framework***. Beijing: O'Reilly, 2003.

Journals

Journal of Web Semantics, Elsevier B.V., T. Finin, R. Mizoguchi, S. Staab (Eds.), http://www.elsevier.com/wps/find/journaldescription.cws_home/671322/description

International Journal On Semantic Web and Information Systems, IGI Global, Hershey, PA, B. Amit Sheth, Gottfried Vossen, Martin Hepp (Eds.) http://www.ijswis.org/

Semantic Web – Interoperability, Usability, Applicability, Pascal Hitzler, Krzysztof Janowicz (Eds.) http://www.semantic-web-journal.net/

Useful resources

W3C Semantic Web Activity
http://www.w3.org/2001/sw/

W3C *RDF Working Group*
http://www.w3.org/2011/rdf-wg/wiki/Main_Page

W3C *OWL Working Group*
http://www.w3.org/2007/OWL/wiki/OWL_Working_Group

W3Schools
http://www.w3schools.com/

RDF Validator
http://www.w3.org/RDF/Validator/

Evaluation and assessment

Written Midterm Exam	30%
Research work (Report + Oral Presentations)	30%
Written Final Exam	40%