Introduction to Knowledge Engineering - Course Outline

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Watch this lecture
and download the slides

Download: http://www.jarrar.info/courses/ORM/Jarrar.LectureNotes.IntroductionToConceptualModeling.pdf

Online Courses: http://www.jarrar.info/courses/

Course Content

- Conceptual analyses using ORM

- Semantic web technologies

- Ontology Engineering

- Modern knowledge-based systems

- Data governance

Intended Learning Objectives

- Knowledge about in conceptual analyses and knowledge engineering

- knowledge about semantic web technologies

- knowledge about Modern knowledge-based systems

- معرفة بطرق تدوين المعرفة وتحليلها على المستوى المفاهيمي

- معرفة بتقنيات الأنطولوجيا والويب الدلالي

- معرفة حول كيفية بناء انظمة معرفية حديثة

Course Outline

The course is divided into three parts:

Part I: Conceptual Data Modeling	10
Part II: Semantic Web Technologies and Ontology	20
Part III: Application Scenarios	10

Course Outline (Part I)

Part I: Conceptual Data Modeling	Reading	time
Introduction		1
Concepts & Principles of Conceptual Data Modeling	Ch.1&2	1
Conceptual Schema Design Steps	Ch.3	1
Uniqueness Constraints	Ch.4	1
Mandatory Constraints	Ch.5	1
Other Constrains	Ch.6&7	1.5
Final Check and Schema Engineering Issues	Ch.7&12	1.5
Project discussions	Discussion	2
First Exam		2
Total		12

Reading: Information Modeling and Relational Databases: From Conceptual Analysis to Logical Design, Terry Halpin (ISBN 1-55860-672-6)
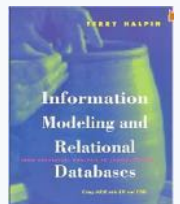
Course Outline (Part II)

Semantic Web Technologies and Ontology *Reading:* Selected Papers + Lecture Notes		22
Introduction to Ontologies		2
RDF and RDFS	Article[3]	4
Ontology Web Language (OWL)	Article[4]	3
Ontology Engineering and Lexical Semantics	Article[5,6]	5
Open Linked Data	Lecture Notes	1
Zinnar: The Palestinian e-Government Framework	Lecture Notes	2
Project discussions		3
Second Exam		2

[1] D. Nardi, R. J. Brachman. An Introduction to Description Logics. In the Description Logic Handbook, edited by F. Baader, D. Calvanese, D.L. McGuinness, D. Nardi, P.F. Patel-Schneider, Cambridge University Press, 2002, pages 5-44.

[2] Mustafa Jarrar: Mapping ORM into the SHOIN/OWL Description Logic- Towards a Methodological and Expressive Graphical Notation for Ontology Engineering. In Volume 4805, LNCS, Pages (729-741), Springer. ISBN: 9783540768890.

[3]RDF Primer: RDF/XML Syntax Specification. W3C Recommendation 10 February 2004. http://www.w3.org/TR/rdf-syntax-grammar/

[4] OWL Web Ontology Language Guide. W3C Recommendation 10 February 2004 http://www.w3.org/TR/2004/REC-owl-guide-20040210/#BasicDefinitions

[5] Chapter 2 and 3 in Jarrar, M.: Towards Methodological Principles for Ontology Engineering. PhD thesis, Vrije Universiteit Brussel (2005).

[6] Mustafa Jarrar: Towards the notion of gloss, and the adoption of linguistic resources in formal ontology engineering. In proceedings of the 15th International World Wide Web Conference (WWW2006). ACM Press. May 2006.

Course Outline (Part III)

Part III: Application Scenarios and Final Project *Reading:* *External Papers*	10
Seminars on selected applications, such as:	
Ontology based software engineering	1
Enhanced Search and Retrieval	1
Integration and interoperability	1
Linguistic Linked Data	1
Ontology-based service-oriented architectures	1
Ontologies in Medical Informatics	1
RDF Queries	1
Graph and NoSQL databases	1
Research Papers	2
Final Exam	

Evaluation

- Intermediate exams   20%

- Final Exam   35%

- Projects   40%

- Participation   5%

* The final Exam includes Research assignments

Course Rules

Attendance. Attendance is mandatory. University regulations regarding this matter will be strictly enforced.

Academic Honesty: Individual work must be each student's own work. Plagiarism or cheating will result in official University disciplinary review.

Missed Exams: There are no makeup exams, and project deadlines are very hard.

Etiquette: Mobile phones must be turned off. Don't come late. If you must go out during the lecture don't let us notice.

Ritaj: We only communicate through Ritaj. I assume you check it several times a day. Additionally, we will also have a Facebook group for informal communication.

References

- Information Modeling and Relational Databases: From Conceptual Analysis to Logical Design, Terry Halpin (ISBN 1-55860-672-6

- [1] D. Nardi, R. J. Brachman. An Introduction to Description Logics. In the Description Logic Handbook, edited by F. Baader, D. Calvanese, D.L. McGuinness, D. Nardi, P.F. Patel-Schneider, Cambridge University Press, 2002, pages 5-44.

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