



## COURSE PRESENTATION FORM – ACADEMIC YEAR 2010/2011

<b>COURSE NAME</b>	<b>Knowledge Representation and Ontologies</b>
<b>COURSE CODE</b>	72011
<b>LECTURER</b>	<a href="#">Diego Calvanese</a> & <a href="#">Luciano Serafini</a>
<b>TEACHING ASSISTANTS</b>	<a href="#">Mariano Rodriguez-Muro</a>
<b>TEACHING LANGUAGE</b>	English
<b>CREDIT POINTS</b>	8
<b>LECTURE HOURS</b>	48
<b>EXERCISE HOURS</b>	24
<b>TIME SPAN</b>	21.02.2011 - 11.06.2011
<b>TIME TABLE</b>	See <a href="#">Timetable Page</a>
<b>OFFICE HOURS LECTURER</b>	Diego Calvanese: during the lecture time span Friday 16:00–18:00, <a href="#">Faculty of CS, POS Building, piazza Domenicani 3</a> , office 2.07; outside of the lecture time span by previous email appointment.  Luciano Serafini: TBA, <a href="#">Faculty of CS, POS Building, piazza Domenicani 3</a> , office 2.10.
<b>OFFICE HOURS TEACHING ASSISTANT</b>	During the lecture time span: by previous email or verbal appointment, <a href="#">Faculty of CS, POS Building, piazza Domenicani 3</a> , office 2.06.
<b>PREREQUISITES</b>	<ul style="list-style-type: none"><li>• Notions about first-order logic as taught in an introductory BSc course on Mathematical Logic;</li><li>• Notions about relational databases as taught in an introductory BSc course.</li></ul>
<b>OBJECTIVES</b>	The aim of the course is to provide students with an understanding of the formal foundations of classical logic-based knowledge representation languages, with an overview of the reasoning methods for them, and of the application of techniques developed in knowledge representation to classical data management problems. Most of the course will focus on description Logics and on ontology languages.
<b>SYLLABUS</b>	<ul style="list-style-type: none"><li>• Knowledge Representation</li><li>• Structural description logics</li><li>• Propositional description logics</li><li>• Knowledge bases</li><li>• Logics and databases</li></ul>



- Management of incomplete and inconsistent data
- Ontology based data access
- Reasoning about queries
- Query reformulation

### TEACHING FORMAT

The course is organized as frontal lectures on the course topics, possibly complemented by monographic seminars that serve as a starting point for discussing the techniques involved. During lab sessions the students will familiarize with the usage and internals of state-of-the-art tools for managing and querying relational data sources through an ontology, and will work on a project.

### ASSESSMENT

The exam consists of:

- a project [30 % of mark]
- a final written exam [70 % of mark]

Both parts have to be passed to pass the exam, but they can be taken independently of each other.

In case of a positive mark, the part that has been passed will count for all 3 regular exam sessions of the Academic Year (i.e., if the student fails or does not take, e.g., the oral exam, he keeps the project and only needs to retake the oral exam).

### READING LIST

Textbook:

- *The Description Logic Handbook: Theory, Implementation and Applications*. Cambridge University Press, 2002. ISBN 0521781760. Edited by F. Baader, D. Calvanese, D. McGuinness, D. Nardi, P. F. Patel-Schneider.
- *Ontologies and databases: The DL-Lite approach*. Diego Calvanese, G. De Giacomo, D. Lembo, M. Lenzerini, A. Poggi, M. Rodriguez-Muro, and R. Rosati. In *Semantic Technologies for Informations Systems - 5th Int. Reasoning Web Summer School (RW 2009)*, volume 5689 of Lecture Notes in Computer Science, pages 255-356. Springer, 2009. Available at <http://www.inf.unibz.it/~calvanese/papers-html/RW-2009.html>

Lecture notes and additional reading material covering the course topics will be provided during the course and made available in the course web page.

### SOFTWARE USED

- Protégé ontology editor
- MySQL or Postgres database engine
- Ontology-based Data Access Tools

### LEARNING OUTCOME

Students will acquire an understanding of the advanced languages, methodologies, and the use of knowledge representation techniques, also in the context of accessing and querying information sources. Automated reasoning techniques and formal semantics will be understood for these languages.

### COURSE PAGE

<http://www.inf.unibz.it/~calvanese/teaching/10-11-kro/>



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**Fakultät für Informatik**

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