COURSE PRESENTATION FORM – ACADEMIC YEAR 2011/2012

COURSE NAME	**Knowledge Representation and Ontologies**
COURSE CODE	72011
LECTURER	Diego Calvanese
TEACHING ASSISTANTS	Mariano Rodriguez-Muro
TEACHING LANGUAGE	English
CREDIT POINTS	8
LECTURE HOURS	48
EXERCISE HOURS	24
OFFICE HOURS LECTURER	During the lecture time span Friday 15:00–17:00, Faculty of CS, POS Building, piazza Domenicani 3, office 2.07; outside of the lecture time span by previous email appointment.
OFFICE HOURS TEACHING ASSISTANT	During the lecture time span: by previous email or verbal appointment, Faculty of CS, POS Building, piazza Domenicani 3, office 2.06
PREREQUISITES	• Notions about first-order logic as taught in an introductory BSc course on Mathematical Logic; • Notions about relational databases as taught in an introductory BSc course;
OBJECTIVES	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.
SYLLABUS	• Knowledge Representation • Structural description logics • Propositional description logics • Knowledge bases • Logics and databases • 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 involvedDuring 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 oral or 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

- *The Description Logic Handbook: Theory, Implementation and Applications* (2nd edition). Cambridge University Press, 2007. ISBN 9780521150118. 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/11-12-kro/