Course Program

Subject code: IFI7121	Subject Name: Knowledge Representation and Reasoning		
Study load 3 ECTS 10 hours of lectures and seminars 16 hours independent study	Load of contact hours: lectures/ workshops/ seminars Lectures: 6 hours Seminars: 4 hours e-Course: 6 hours	Study semester: Study semester: Spring S2 – second half of the spring semester;	Exam
Objectives:	To provide a theoretical and practical understanding of the next generation semantic web and the underlying knowledge representation and reasoning techniques. It will introduce students to description logics, ontology design, and the fundaments of knowledge acquisition and elicitation.		
Course Outline	This course presents both the foundations and practice of knowledge representation and knowledge engineering. The course is split between theoretical material on logic notations and practical work on developing knowledge representation models. The course uses the latest version of the Protégé software (open-source) environment for developing ontologies. The lectures (two blocks of three hours) present the recent and currrent work in the fields of knowledge management and engineering, including specific knowledge reasoning techniques and ontology design. Individual work (8h) includes reading and preparing essays. The final seminar (4 h) includes the presentation and discussion of the essays.		
Learning Outcomes:	The student should be able to discuss the fundamentals of knowledge representation; to understand the basic syntax, semantics and decision procedures for the family of description logics; to discuss and explain what is an ontology, and the representational languages; to understand the common ontological structures and principles of ontology development, and to be able to understand the current development of the next generation Web: the Semantic Web.		
Assessment Methods:	Independent work (homework and e-coursework): 25%, Class Presentation and Discussion: 35%, Final Essay (group work and oral presentation): 40%		
Lecturer:	José Braga de Vasconcelos, PhD in Computer Science.		
Language of instruction:	English		
Subject title in Estonian:			
Prerequisite subject(s):	Basic background in Information Systems		

Compoulsory Literature	Guus Schreiber et al. (2000) *Knowledge engineering and management: the CommonKADS methodology,* MIT press, Cambridge, MA. Natalya Noy and Deborah McGuinness (2001) *Ontology Development 101: A Guide to Creating Your First Ontology*. Stanford Knowledge Systems Laboratory Technical Report KSL-01-05, March 2001.
Replacement Literature	John F. Sowa, *Knowledge Representation: Logical, Philosophical, and Computational Foundations*, Brooks Cole Publishing Co., 1999, ISBN 0-534-94965-7. Open source ontology editor and knowledge-base framework: http://protege.stanford.edu/
Participation and Exam requirements	Students must participate at least in half of the lectures and they should present (and discuss) their (preliminary) essays in the final seminar. The final essay should be submitted no later than 23rd May 2011.
Independent work	Reading and preparing essays and discussing (email or individual/group sessions) the underlying development with the lecturer.
Exam evaluation criteria or minimum level required for pass/fail assessment:	Grading criteria: A - 90-100% of the work is done - excellent: outstanding performance with only minor errors. B - 80-90% of the work is done - very good: above average, but with some minor errors. C - 70-80% of the work is done - good: generally good work with a number of notable errors. D - 60-70% of the work is done - satisfactory: fair but with significant shortcomings. E - 50-60% of the work is done - sufficient: passable performance, meeting the minimum criteria. F- less than 50% of the work is done - fail: more work is required before the credit can be awarded.
Content of studies and schedule:	Relevant dates: A preliminary essay (presentation) should be submitted until 28.04.11. The final essay should be submitted no later than May 23rd. Final grades will be set by the end of May 2011. 25.04.2011 Introduction to the course activities, and discussion of the previous e-course resources. Fundamentals of knowledge management and engineering. 26.04.2011 Knowledge representation and reasoning. Ontology design. Domain examples.

	28.04.2011 Seminar and discussion.