SYLLABUS

1. Information regarding the programme

1.1 Higher education institution	**Babeş Bolyai University**
1.2 Faculty	**Faculty of Mathematics and Computer Science**
1.3 Department	**Department of Computer Science**
1.4 Field of study	**Computer Science**
1.5 Study cycle	**Bachelor**
1.6 Study programme / Qualification	**Computer Science**

2. Information regarding the discipline

2.1 Name of the discipline	**Ontologies and Their Applications in Computer Science**						
2.2 Course coordinator	**Ph. D. Lecturer Andreea-Diana Mihiș**						
2.3 Seminar coordinator	**Ph. D. Lecturer Andreea-Diana Mihiș**						
2.4. Year of study	**2**	2.5 Semester	**4**	2.6. Type of evaluation	**C**	2.7 Type of discipline	**Optional**

3. Total estimated time (hours/semester of didactic activities)

3.1 Hours per week	3	Of which: 3.2 course	2	3.3 seminar/laboratory	1
3.4 Total hours in the curriculum	42	Of which: 3.5 course	28	3.6 seminar/laboratory	14
Time allotment:					hours
Learning on electronic platform http://moodle.cs.ubbcluj.ro/, using manual, course support, bibliography, course notes					12
Additional documentation (in libraries, on electronic platforms, field documentation)					6
Preparation for seminars/labs, homework, papers, portfolios and essays					12
Tutorship					6
Evaluations					12
Other activities: individual project					10

3.7 Total individual study hours	58
3.8 Total hours per semester	100
3.9 Number of ECTS credits	4

4. Prerequisites (if necessary)

4.1. curriculum	
4.2. competencies	Programming skills in a high level programming language

5. Conditions (if necessary)

5.1. for the course	• A room with Internet access and presentation devices
5.2. for the seminar /lab activities	• Laboratory with computers; high level programming language environment (.NET or any Java environment a.s.o.), Protégé

6. Specific competencies acquired

Professional competencies	• Knowledge, understanding and usage of basic concepts, tasks and applications of Ontology. • • Ontology modelling skills. • • Representative ontology example knowledge.
Transversal competencies	• Ontology usage for Natural Language Processing and Semantic Web.

7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	• To understand the basic concepts and to use an ontology
7.2 Specific objective of the discipline	At the end of the semester students must be able to: • model an ontology • choose the corresponding ontology for a specific problem • use an ontology for a specific problem solving • know some representative ontology examples

8. Content

8.1 Course	Teaching methods	Remarks
Course 1. Ontology overview	Exposure, debate, dialogue, explanation, examples, teamwork	
Course 2. Ontology classification (by domain and structure)	idem	
Course 3. Ontology editor Protégé	idem	
Course 4 (first hour). Computer representation of the ontology (Universal Resource Identifier)	idem	
Course 4 (second hour) and 5. Ontology modelling - Resource Description Framework	idem	
Course 6 and 7. Ontology modelling - Ontology Web Language	idem	
Course 8. Modelling problems (transitivity, frequent errors)	idem	

Course 9. Representative examples of ontology	idem	
Course 10. Ontology specific operations (ontology comparison, ontology merging)	idem	
Course 11. Used Ontology for information retrieval from Natural Language Texts	idem	
Course 12. Used Ontology for efficient information search in the Internet (Semantic Web)	idem	
Course 13. Other ontology applications	idem	
Course 14. Students' presentations of the practical project.	Debate, dialog	

Bibliography

1. Allemang, D. and Hendler, J., *Semantic Web for the Working Ontologist: Modelling in RDF, RDFS and OWL*, Burlington, Morgan Kaufmann, 2008.
2. Cross, V. and Pal, A., *A Consumer Ontology Analysis Tool*, 9th Intl. Protégé Conference, Stanford Center for Biomedical Informatics Research at the Stanford University School of Medicine - Stanford, California, 23-26 July 2006, http://protege.stanford.edu/conference/2006/submissions/abstracts/11.2_crossvProtegeConference.pdf.
3. Gangemi, A., Catenacci, C., Ciaramita, M. and Lehmann, J., *Ontology Evaluation and Validation. An integrated formal model for the quality diagnostic task*, Technical report, ISTC-CNR, Lab. for Applied Ontology, http://www.loa-cnr.it/Files/OntoEval4OntoDev_Final.pdf
4. Segaran, T., Evans, C. and Taylor J., *Programming the Semantic Web*, O'Reilly Media, Sebastopol, 2009.
5. Pollock, J. T., *Semantic Web for Dummies*, Wiley Publishing, Indianapolis, 2009.

8.2 Seminar / laboratory	Teaching methods	Remarks
1. Ontology overview and classifications	Exercise, individual study	The seminar/lab is structured as 2 hours classes every second week
2. Usage of Protégé for ontology definition	idem	
3. Problems solved with RDF	idem	
4. Problems solved with OWL	idem	
5. Representative examples of ontology	idem	
6. Ontology usage for information retrieval from Natural Language Texts	idem	
7. Ontology usage for efficient information search in the Internet (Semantic Web)	idem	

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

- Lately, the internet browsing and web page retrieval was improved due to the usage of Semantic information embedded in the web pages and the usage of Ontology. Ontologies

make possible for the computer to understand Natural Language, so they have different applications in Natural Language Processing.
- In the ACM topic list, Ontology engineering belongs to the Knowledge Representation topic.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	- understand the theoretical concepts of the domain; - apply the course methods and algorithms in problem solving, similar to those discussed in the course. A written A4 sheet of paper can be used as help.	Written exam	50%
	- apply on the spot at the Course the presented methods in concrete problems and on-line solving of a set of problems using the platform http://moodle.cs.ubbcluj.ro/	Course activity	10%
10.5 Seminar/lab activities	- be able to apply the notions and methods presented at Course in order to solve small problems similar to those presented in the Course	Laboratory activity	15%
	- be able to use the notions and methods presented at the Course in order to solve specific problems	Practical project	25%
10.6 Minimum performance standards			
➢ At least 5 for the computed average.			

Date
May 16 2013

Signature of course coordinator
Ph. D. Lecturer Andreea-Diana Mihiș

Signature of seminar coordinator
Ph. D. Lecturer Andreea-Diana Mihiș

Date of approval
.....

Signature of the head of department
Ph. D. Prof. Bazil Pârv