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	36	Of which: 3.5 course	24	3.6 seminar/laboratory	12
Time allotment:					hours
Learning on electronic platform http://moodle.cs.ubbcluj.ro/, using manual, course support, bibliography, course notes					48
Additional documentation (in libraries, on electronic platforms, field documentation)					12
Preparation for seminars/labs, homework, papers, portfolios and essays					24
Tutorship					6
Evaluations					24
Other activities: individual project					25

3.7 Total individual study hours	139
3.8 Total hours per semester	175
3.9 Number of ECTS credits	7

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	• C3.1 Description of concepts, theories and models used in the scope • C3.2 Identification and explanation of basic computer models appropriate for the scope • C3.3 Utilization of mathematical and informatical models and tools for solving of specific problems to the scope • C3.4 Data and models analysis • C3.5 Informatical components elaboration for interdisiciplinare projects
Transversal competencies	• CT1 Applying organized and efficient work rules, applying of the responsible attitudes to the scientific teaching domain, for the creative exploitation of their potential, respecting the principles and rules of professional ethics • CT2 Efficient development of the activities organized in an inter-disciplinary group and the development of empathic capacities of inter-personal communication, networking and collaboration with diverse groups • CT3 The use of effective methods and techniques of learning, information, research and the development of the capacity to exploit knowledge, to adapt to the requirements of a dynamic society and of communication in Romanian language and in a foreign language

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	idem	

errors)		
Course 9. Representative examples of ontology	idem	
Course 10. Ontology specific operations (ontology comparison, ontology merging)	idem	
Course 11. Use of Ontologies for information retrieval from Natural Language Texts and for efficient information search in the Internet (Semantic Web)	idem	
Course 12. 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 and 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	- to 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%
	- to 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
April 30 2015

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

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

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