

## 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	Master
1.6 Study programme / Qualification	Applied Computational Intelligence

### 2. Information regarding the discipline

2.1 Name of the discipline	Applications of Computational Linguistics						
2.2 Course coordinator	Lecturer PhD. Dana Lupsa						
2.3 Seminar coordinator	Lecturer PhD. Dana Lupsa						
2.4. Year of study	<b>2</b>	2.5 Semester	<b>4</b>	2.6. Type of evaluation	<b>E</b>	2.7 Type of discipline	<b>Compulsory</b>

### 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 using manual, course support, bibliography, course notes					29
Additional documentation (in libraries, on electronic platforms, field documentation)					29
Preparation for seminars/labs, homework, papers, portfolios and essays					40
Tutorship					11
Evaluations					30
Other activities: .....					
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	<ul style="list-style-type: none"> <li>• Average programming skills</li> <li>• Knowledge of data structures</li> </ul>

### 5. Conditions (if necessary)

5.1. for the course	•
5.2. for the seminar /lab activities	•

## 6. Specific competencies acquired

<b>Professional competencies</b>	<ul style="list-style-type: none"> <li>• Knowledge, understanding and use of IR concepts and their algorithms</li> <li>• Knowledge, understanding and use of of MT systems</li> </ul>
<b>Transversal competencies</b>	<ul style="list-style-type: none"> <li>• Perform Internet-based research.</li> <li>• Ability to use techniques specific to information retrieval and machine translation.</li> </ul>

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

7.1 General objective of the discipline	<ul style="list-style-type: none"> <li>• Understand how IR and MT systems works</li> <li>• Identify techniques for information retrieval, language translation</li> </ul>
7.2 Specific objective of the discipline	<ul style="list-style-type: none"> <li>• Explain basic information storage and retrieval concepts.</li> <li>• Describe what issues are specific to efficient information retrieval.</li> <li>• Perform Internet-based research.</li> <li>• Design and implement a small to medium size information storage and retrieval system, or digital library.</li> <li>• Understand techniques for information retrieval, language translation</li> <li>• Study the usage of corpora. Identify examples of corpora for MT</li> </ul>

## 8. Content

8.1 Course	Teaching methods	Remarks
1,2. Information Storage and Retrieval.	Exposure, examples, discussion	
3,4. Ranked retrieval.	Exposure, description, explanation, examples, case studies	
5. Phrase in NLP	Exposure, description, explanation, examples, case studies	
6. Dictionaries and tolerant retrieval.	Exposure, description, explanation, examples, case studies	
7. Performance issues	Exposure, description, explanation, examples, case studies	

8. Relevance feedback	Exposure, description, explanation, examples, case studies	
9,10. Probabilistic retrieval	Exposure, examples, discussion	
11. Web as graph. Link analysis	Description, examples, case studies, discussion	
12 Machine translation (MT).	Exposure, description, explanation, examples, case studies, discussion	

#### Bibliography

1. ALLEN, J.F. "Natural Language Semantics", Wiley-Blackwell; 1 edition, 2001
2. D. Arnold, L. Balkan, S. Meijer, R. Humphreys, L. Sadler, Machine Translation: An Introductory Guide, Manchester, UK: NEC Blackwell, 1994. <http://clwww.essex.ac.uk/~doug/book/book.html>.
3. R. BAEZA-YATES, B. RIBEIRO-NETO, "Modern Information Retrieval", Addison-Wesley, 1999
4. E. CHARNIAK: "Statistical language learning", MIT Press, 1996.
5. C.MANNING, H.SCHUTZE: "Foundation of statistical natural language processing", MIT, 1999.
6. C. MANNING, P. RAGHAVAN, H. SCHUTZE, "Introduction to Information Retrieval", Cambridge University Press, 2008.
7. R. MITKOV ed., The Oxford Handbook of Computational Linguistics (Oxford Handbooks in Linguistics), 2005

8.2 Seminar / laboratory	Teaching methods	Remarks
1: Data structure in IR and algorithms	Dialogue, examples	
2. Ranking example		
3: Information in text : experiments	Dialogue, examples	
4,5: Applications of theoretical techniques. Experiments with a corpus	Dialogue, case studies, examples	
6: Applications. Advances in CL	Case studies, examples	

#### Bibliography

1. R. Mitkov (Ed), Oxford Handbook of Computational Linguistics. Oxford University Press, 2003.
2. C.D. Manning, P. Raghavan, H. Schütze., Introduction to Information Retrieval. Cambridge, England: Cambridge University Press, 2008.  
<http://nlp.stanford.edu/IR-book/html/htmledition/irbook.html>
3. <http://www.mt-archive.info/>
4. <http://www.statmt.org/>

### **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**

- Two fields of CL with immediate applications in real life are IR and MT. IR systems are used on an everyday basis by a wide variety of users. The Internet has proven to be a huge stimulus for MT, with hundreds of millions of pages of text and an increasingly global -- and linguistically diverse -- public.
- The course respects ACM Curricula Recommendations for Computer Science studies



**10. Evaluation**

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	- know the basic principle of the domain; - apply the course concepts	Written exam	40%
	- applications of the studied concepts and algorithms	Project evaluation	30%
10.5 Seminar/lab activities	- apply the course concepts - problem solving	Oral presentation / interaction	bonus points added to the final grade for students with activity
		Research report presentation	30 %
		Project evaluation	30 %
10.7 Minimum performance standards			
➤ At least grade 5 (from a scale of 1 to 10) at both written exam and project evaluation			

Date

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Signature of course coordinator

lecturer PhD Dana Lupsa

Signature of seminar coordinator

lecturer PhD Dana Lupsa

Date of approval

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Signature of the head of department

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