SYLLABUS

1. Information regarding the programme

1.1 Higher education institution	**Babes-Bolyai University**
1.2 Faculty	**Mathematics and Informatics**
1.3 Department	**Informatics**
1.4 Field of study	**Informatics**
1.5 Study cycle	**Master**
1.6 Study programme / Qualification	**Applied computational intelligence**

2. Information regarding the discipline

2.1 Name of the discipline (en) (ro)			**Algorithms, models and concepts in distributed systems** **Algoritmi, modele şi concepte in sisteme distribuite**				
2.2 Course coordinator			**Assoc. prof. Rareş Boian**				
2.3 Seminar coordinator			**Assoc. prof. Rareş Boian**				
2.4. Year of study	**2**	2.5 Semester	**4**	2.6. Type of evaluation	**E**	2.7 Type of discipline	**Optional**
2.8 Code of the discipline		**MME8110**					

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 using manual, course support, bibliography, course notes					**39**
Additional documentation (in libraries, on electronic platforms, field documentation)					**29**
Preparation for seminars/labs, homework, papers, portfolios and essays					**39**
Tutorship					**25**
Evaluations					**26**
Other activities:					

3.7 Total individual study hours	**158**
3.8 Total hours per semester	**200**
3.9 Number of ECTS credits	**8**

4. Prerequisites (if necessary)

4.1. curriculum	·
4.2. competencies	·

5. Conditions (if necessary)

5.1. for the course	· The requirements are posted here http://www.cs.ubbcluj.ro/~rares/course/amcsd/
5.2. for the seminar /lab activities	· The requirements are posted here http://www.cs.ubbcluj.ro/~rares/course/amcsd/

6. Specific competencies acquired

Professional competencies	· Define notions, concepts, theories and models of distributed systems. · Critical analysis and use of the principles, methods and techniques work for quantitative and qualitative evaluation of the processes within distributed systems · Apply basic concepts and theories in the field of distributed systems, programming methods and operating systems project development professional
Transversal competencies	· Execution of the tasks required under specified requirements and the deadlines imposed, with the rules of professional ethics and moral conduct · Information and permanent documentation in its field · Seeking to improve business results by engaging in professional activities

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

7.1 General objective of the discipline	· Learning basic distributed systems and distributed algorithms concepts · Learn to implement distributed algorithms
7.2 Specific objective of the discipline	· Abstractions used in modelling the distributed algorithms · Distributed systems theoretical models · Broadcast algorithms · Shared memory algorithms · Consensus algorithms

8. Content

8.1 Course	Teaching methods	Remarks
Weeks 1-2: Distributed systems models and abstractions	· Interactive exposure · Explanation · Conversation · Didactical demonstration	
Weeks 3-4: Basic and reliable broadcast algorithms	· Interactive exposure · Explanation · Conversation · Didactical demonstration	
Weeks 5-6: Uniform and probabilistic broadcast algorithms	· Interactive exposure · Explanation · Conversation · Didactical demonstration	
Weeks 7-8: Shared memory - regular registers	· Interactive exposure · Explanation · Conversation · Didactical demonstration	
Weeks 9-10: Shared memory - atomic registers	· Interactive exposure · Explanation · Conversation · Didactical demonstration	
Weeks 11-12: Consensus - flooding	· Interactive exposure · Explanation	

	· Conversation · Didactical demonstration	
Weeks 13-14: Consensus - hierarchical	· Interactive exposure · Explanation · Conversation · Didactical demonstration	

Bibliography
1. BARNABY T. Distributed .NET Programming in C#. Apress, 2002
2. BOIAN F.M. Programarea distribuita in internet; metode si aplicatii. Ed. Albastra, Cluj, 1997
3. CHRISTIAN CACHIN, RACHID GUERRAOUI, LUIS RODRIGUES, Introduction to Reliable and Secure Distributed Programming, Second Edition, Springer, 2011
4. HUGHES C. HUGHES T. Parallel and Distributed Programming Using C++. Addison Wesley, 2003
5. LANG U. SCHREINER R. Developing Secure Distributed Systems with CORBA. Artech House, 2002
6. LYNCH N.A. Distributed Algorithms. Morgan Kaufmann Pub. 1996
7. TANENBAUM A.S. Distributed Operating Systems. Prentice Hall, 2000
8. TEL G. Introduction to Distributed Algorithms. Cambridge Press, 1994
9. WEIKUM G. VOSSEN G. Transactional Information Systems: theory, algorithms, and the practice of concurrency control and recovery. Morgan Kaufmann Pub. 2002

8.2 Seminar / laboratory	Teaching methods	Remarks
Distributed algorithm implementation architecture	· Interactive exposure · Explanation · Conversation · Didactical demonstration	
Detailed discussion about the implementation and testing of the broadcast algorithm	· Interactive exposure · Explanation · Conversation · Didactical demonstration	
Detailed discussion about the implementation and testing of the shared memory algorithm	· Interactive exposure · Explanation · Conversation · Didactical demonstration	
Detailed discussion about the implementation and testing of the consensus algorithm	· Interactive exposure · Explanation · Conversation · Didactical demonstration	

Bibliography
1. BARNABY T. Distributed .NET Programming in C#. Apress, 2002
2. BOIAN F.M. Programarea distribuita in internet; metode si aplicatii. Ed. Albastra, Cluj, 1997
3. CHRISTIAN CACHIN, RACHID GUERRAOUI, LUIS RODRIGUES, Introduction to Reliable and Secure Distributed Programming, Second Edition, Springer, 2011

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

· By learning the theoretical and methodological concepts and addressing the practical aspects of the Algorithms, models and concepts in distributed systems course, students acquire a body of knowledge consistent, consistent with partial competencies required for possible occupations provided in Grid 1 - RNCIS
· The course complies with IEEE and ACM Curriculla Recommendations for Computer Science studies.
· The course curriculum exists in universities and faculties in Romania

· The course content is very well appreciated by software companies whose employees and graduates of this course

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	The level of knowledge and understanding of the course subjects	Written exam	25%
10.5 Seminar/lab activities	Ability to solve practical problems, specific to the course subjects	Broadcast project	25%
		Shared memory project	25%
		Consensus project	25%
10.6 Minimum performance standards			
Ø Minimum 5 in the final grade			

Date	Signature of course coordinator	Signature of seminar coordinator
20.04.2018	Assoc.prof. Rareş Boian	Assoc.prof. Rareş Boian

Date of approval

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Signature of the head of department

Prof.dr. Anca Andreica