

## SYLLABUS

### 1. Information regarding the programme

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

### 2. Information regarding the discipline

2.1 Name of the discipline (en) (ro)	<b>Systems for Design and Implementation (Medii de proiectare și programare)</b>						
2.2 Course coordinator	<b>Lect. PhD. Vlad-Sebastian Ionescu</b>						
2.3 Seminar coordinator	<b>Lect. PhD. Vlad-Sebastian Ionescu</b>						
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>
2.8 Code of the discipline	<b>MLE5013</b>						

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

3.1 Hours per week	<b>5</b>	Of which: 3.2 course	<b>2</b>	3.3 seminar/laboratory	<b>2 lab + 1 pr</b>
3.4 Total hours in the curriculum	<b>70</b>	Of which: 3.5 course	<b>28</b>	3.6 seminar/laboratory	<b>42</b>
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					<b>20</b>
Additional documentation (in libraries, on electronic platforms, field documentation)					<b>30</b>
Preparation for seminars/labs, homework, papers, portfolios and essays					<b>25</b>
Tutorship					<b>5</b>
Evaluations					<b>14</b>
Other activities: .....					-
3.7 Total individual study hours	<b>80</b>				
3.8 Total hours per semester	<b>150</b>				
3.9 Number of ECTS credits	<b>6</b>				

### 4. Prerequisites (if necessary)

4.1. curriculum	<input type="checkbox"/> Advanced Programming Methods <input type="checkbox"/> Databases
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	<input type="checkbox"/> Distributed Operating Systems
4.2. competencies	<input type="checkbox"/> Average programming skills in a high level programming language <input type="checkbox"/> Basic concepts of databases <input type="checkbox"/> Basic concepts of networking

### 5. Conditions (if necessary)

5.1. for the course	<input type="checkbox"/> Room with projector
5.2. for the seminar /lab activities	<input type="checkbox"/> Laboratory with internet access and ability to use personal laptops

### 6. Specific competencies acquired

<b>Professional competencies</b>	C2.1 Identification of suitable methodologies for developing software systems C2.2 Identification and explanation of suitable mechanism for software systems specification C2.3 Usage of methodologies, specification mechanisms and development environments for software systems development C2.4 Usage of suitable criteria and methods for software systems evaluation C2.5 Development of specific software systems
<b>Transversal competencies</b>	CT1 Application of rules for organized and efficient work, of responsible attitudes towards education-scientific domain for creative evaluation of self-potential, respecting the professional ethics principles and norms CT2 Efficient development of activities organized in an interdisciplinary group and the development of emphatic abilities of inter-human communication, relationships and collaboration with different groups CT3 Usage of efficient learning, information, research and development methods and techniques for knowledge reevaluation abilities, for adaptation to the requirements of a dynamic society, and for communication in Romanian language and another foreign language.

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

7.1 General objective of the discipline	<input type="checkbox"/> To understand distributed software concepts and problems <input type="checkbox"/> Improved design and programming skills
7.2 Specific objective of the discipline	<input type="checkbox"/> To have a systematic knowledge concerning application development methodologies <input type="checkbox"/> To be familiarized with modern concepts and preoccupations in the field of developing application software <input type="checkbox"/> To know the use of computer-aided software development tools

## 8. Content

8.1 Course	Teaching methods	Remarks
1. Build automation, dependency management; version control systems	Presentation, conversation, case studies	
2. JDBC	Presentation, conversation, case studies	
3. Inversion of control containers	Presentation, conversation, case studies	
4. The client server architecture	Presentation, conversation, case studies	
5. Remote procedure call	Presentation, conversation, case studies	
6. Object relational mapping	Presentation, conversation, case studies	
7. Object relational mapping	Presentation, conversation, case studies	
8. Enterprise application integration	Presentation, conversation, case studies	
9. Enterprise application integration	Presentation, conversation, case studies	
10. Web services	Presentation, conversation, case studies	
11. Web applications	Presentation, conversation, case studies	
12. Web sockets	Presentation, conversation, case studies	
13. Web security	Presentation, conversation, case studies	
14. NoSql databases	Presentation, conversation, case studies	
Bibliography		
1. Joseph Albahari and Ben Albahari, C# 6.0 in a Nutshell, Sixth Edition, O'Reilley, 2015.		
2. Larman, C.: Applying UML and Design Patterns: An Introduction to OO Analysis and Design and Unified Process, Berlin, Prentice Hall, 2002.		
3. Fowler, M., Patterns of Enterprise Application Architecture, Addison-Wesley, 2002.		
4. Hohpe, G., Woolf, B., Enterprise integration patterns, Addison-Wesley, 2003.		
5. ***, Microsoft Developer Network, Microsoft Inc., <a href="http://msdn.microsoft.com/">http://msdn.microsoft.com/</a>		
6. ***, The Java Tutorial, SUN Microsystems, Inc. <a href="http://download.oracle.com/javase/tutorial/">http://download.oracle.com/javase/tutorial/</a>		
7. Eckel, B., Thinking in Java, 4th edition, Prentice Hall, 2006		
8. Walls, Craig, Spring in Action, Fourth Edition, Ed. O'Reilley, 2015.		
9. Spring <a href="http://projects.spring.io/spring-framework">http://projects.spring.io/spring-framework</a>		
8.2 Seminar / laboratory	Teaching methods	Remarks
1. Build automation, dependency management; version control systems	Presentation, conversation, case studies	
2. JDBC	Presentation, conversation, case studies	
3. Inversion of control containers	Presentation, conversation, case studies	
4. The client server architecture	Presentation, conversation, case studies	
5. Remote procedure call	Presentation, conversation, case studies	
6. Object relational mapping	Presentation, conversation, case studies	
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## Bibliography

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3. Fowler, M., Patterns of Enterprise Application Architecture, Addison-Wesley, 2002.
4. Hohpe, G., Woolf, B., Enterprise integration patterns, Addison-Wesley, 2003.
5. \*\*\*, Microsoft Developer Network, Microsoft Inc., <http://msdn.microsoft.com/>
6. \*\*\*, The Java Tutorial, SUN Microsystems, Inc. <http://download.oracle.com/javase/tutorial/>
7. Eckel, B., Thinking in Java, 4th edition, Prentice Hall, 2006
8. Walls, Craig, Spring in Action, Fourth Edition, Ed. O'Reilley, 2015.
9. Spring <http://projects.spring.io/spring-framework>

## 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

- The course fulfils the IEEE and ACM Curricula Recommendations for Computer Science studies
- The content of the course is considered by software companies as being important for average design and advanced programming skills

## 10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	To know the basic concepts of developing distributed applications	Written exam	40
	To apply these concepts to design and implement a small distributed application	Practical exam	40
10.5 Seminar/lab activities	Being able to design and implement distributed applications using various technologies	Practical examination, observation documentation	20
10.6 Minimum performance standards			
<input type="checkbox"/> At least grade 5 (1 to 10 scale) at all activities seminar/lab, written exam, practical exam (and the final grade at least 5)			

Date

24.04.2023

Signature of course coordinator

Lect. PhD. Vlad-Sebastian Ionescu.

Signature of seminar coordinator

Lect. PhD. Vlad-Sebastian Ionescu

Date of approval

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Signature of the head of department

Prof. PhD. Laura Silvia Dioşan