

## SYLLABUS

### *Elaborarea lucrării de disertație / Work for Dissertation Project*

University year 2025-2026

#### 1. Information regarding the programme

1.1. Higher education institution	Babeş-Bolyai University
1.2. Faculty	Mathematics and Computer Science
1.3. Department	Mathematics
1.4. Field of study	Mathematics
1.5. Study cycle	Master
1.6. Study programme/Qualification	Mathematics and Computer Science
1.7. Form of education	Full time

#### 2. Information regarding the discipline

2.1. Name of the discipline	<b>Master Thesis Elaboration</b>			Discipline code	<b>MME3042</b>		
2.2. Course coordinator				Prof. dr. Andrei Mărcuș			
2.3. Seminar coordinator				Prof. dr. Andrei Mărcuș			
2.4. Year of study	2	2.5. Semester	4	2.6. Type of evaluation	C	2.7. Discipline regime	Compulsory

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

3.1. Hours per week	<b>1</b>	of which: 3.2 course	<b>0</b>	3.3 seminar/laboratory	<b>1</b>
3.4. Total hours in the curriculum	12	of which: 3.5 course	0	3.6 seminar/laborator	<b>12</b>
<b>Time allotment for individual study (ID) and self-study activities (SA)</b>					<b>hours</b>
Learning using manual, course support, bibliography, course notes (SA)					100
Additional documentation (in libraries, on electronic platforms, field documentation)					70
Preparation for seminars/labs, homework, papers, portfolios and essays					-
Tutorship					-
Evaluations					-
Other activities: communication with the adviser					18
<b>3.7. Total individual study hours</b>					<b>188</b>
<b>3.8. Total hours per semester</b>					<b>200</b>
<b>3.9. Number of ECTS credits</b>					<b>8</b>

#### 4. Prerequisites (if necessary)

4.1. curriculum	
4.2. competencies	

#### 5. Conditions (if necessary)

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

### 6.1. Specific competencies acquired <sup>1</sup>

<b>Professional/essential competencies</b>	<ul style="list-style-type: none"> <li>• Ability of understanding large bibliography items connected to a particular notion and results concerning it</li> <li>• Synthetization capabilities</li> <li>• Critical thinking in making comparisons and generalization</li> <li>• Development of novel ideas supported by correct mathematical proof</li> <li>• Modelling both a theoretical and a practical problems. Identifying appropriate solutions for the specific problem and developing original responses</li> </ul>
<b>Transversal competencies</b>	<ul style="list-style-type: none"> <li>• application of organized and efficient work rules, of responsible attitudes towards the didactic-scientific field, to bring creative value to own potential, with respect for professional ethics principles and norms</li> <li>• use of efficient methods and techniques to learn, inform, research and develop the abilities to bring value to knowledge, to adapt at the requirements of a dynamical society and to communicate efficiently in Romanian language and in an international language</li> </ul>

### 6.2. Learning outcomes

<b>Knowledge</b>	<p>The student knows:</p> <ul style="list-style-type: none"> <li>• The graduate has the ability to develop, design and create new applications, systems or products using best practices of the field.</li> <li>• The graduate has knowledge related to programming, mathematics, engineering and technology and has the skills to use them to create complex information technology systems.</li> <li>• The graduate has adequate knowledge related to the use of integrated development environments for creating large complex applications.</li> </ul>
<b>Skills</b>	<p>The student is able to:</p> <ul style="list-style-type: none"> <li>• The graduate has the necessary skills for computer program design and software systems analysis.</li> <li>• The graduate is able to apply architectural styles, design patterns and best practices in the field to design software applications of high complexity.</li> <li>• The graduate has the ability to choose and use existing modules and environments for application development.</li> </ul>
<b>Responsibility and autonomy:</b>	<p>The student can work independently to obtain</p> <ul style="list-style-type: none"> <li>• The graduate has the necessary knowledge for literature review.</li> <li>• The graduate can write a scientific/technical report.</li> <li>• The graduate can observe and obtain information from various sources.</li> </ul>

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

<b>7.1 General objective of the discipline</b>	<ul style="list-style-type: none"> <li>• The course represents the individual work the student performs with the purpose to prepare the Master's Degree thesis on a given topic.</li> </ul>
<b>7.2 Specific objective of the discipline</b>	<p>At the completion of this course, the student should:</p> <ul style="list-style-type: none"> <li>• have documentation abilities on an established topic</li> <li>• be able to design the table of contents of a thesis</li> <li>• know how to write a technical document (research paper) in many iterations</li> <li>• know how to conduct a small size research project, use research methodologies</li> </ul>

<sup>1</sup> One can choose either competences or learning outcomes, or both. If only one option is chosen, the row related to the other option will be deleted, and the kept one will be numbered 6.

## 8. Content

8.1 Course	Teaching methods	Remarks
Bibliography		
8.2 Seminar / laboratory	Teaching methods	Remarks
1. Classical structure of a Master Thesis in mathematics and computer science. Coordinator election and choice of research subject. Writing in Latex of MathType.	Presentation, debate, case study	Assignment 1: final choice of coordinator and of research subject
2. Documentation techniques. Academic ethics. Structure of the Master thesis and choice of references.	Presentation, debate, case study	Assignment 2: establishing the main references
3. The design of the chapter containing the main theoretic results	Presentation, debate, case study	Assignment 3: Chapter 2 of the Master thesis
4. The design of the chapter containing the main applications	Presentation, debate, case study	Assignment 4: Chapter 3 of the Master thesis
5. Presentation techniques	Presentation, debate, case study	Assignment 5: Chapter 1 of the Master thesis
7. Final review of the Master thesis. Anti-plagiarism software.	Presentation, debate, case study	Assignment 6: Final version of Master thesis and the anti-plagiarism report
Bibliography		
<ol style="list-style-type: none"> <li>1. Eco Umberto: <i>Cum se face o teză de licență</i>, Polirom, 2020</li> <li>2. Vivaldi Franco: <i>Mathematical writing</i>, Springer (undergraduate Mathematics Series), 2014</li> <li>3. Manchester Academic Phrasebank <a href="https://www.phrasebank.manchester.ac.uk/">https://www.phrasebank.manchester.ac.uk/</a></li> <li>4. Academic writing: <a href="https://www.eapfoundation.com/writing/what/">https://www.eapfoundation.com/writing/what/</a></li> <li>5. Wiese Andreas: <i>How to write a bachelor/master thesis</i>, <a href="https://www.math.cit.tum.de/fileadmin/w00ccg/math/personen/discrete_math/Andreas_Wiese/writing-thesis.pdf">https://www.math.cit.tum.de/fileadmin/w00ccg/math/personen/discrete_math/Andreas_Wiese/writing-thesis.pdf</a></li> <li>6. Hardt Wolfram: <i>Guideline for Writing Bachelor thesis</i>, TU Chemnitz, Germany <a href="https://www.tu-chemnitz.de/informatik/ce/files/Guidelines-Bachelor-Thesis.pdf">https://www.tu-chemnitz.de/informatik/ce/files/Guidelines-Bachelor-Thesis.pdf</a></li> </ol>		

## 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 respects the IEEE and ACM Curricula Recommendations for Software Engineering studies.
- The course exists at the major universities in Romania offering similar study programs;

## 10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade
10.4 Course			
10.5 Seminar/laboratory	The grade given by the lecturer	Evaluation of assignments	50%
	The grade given by the scientific coordinator	Evaluation of the scientific content of the thesis	50%
10.6 Minimum standard of performance			
<ul style="list-style-type: none"> <li>• Grade 5</li> </ul>			

## 11. Labels ODD (Sustainable Development Goals)<sup>2</sup>

	General label for Sustainable Development							
								

Date:  
11.04.2025

Signature of course coordinator

Prof. dr. Andrei Mărcuș

Signature of seminar coordinator

Prof. dr. Andrei Mărcuș

Date of approval:  
25.04.2025

Signature of the head of department

Prof. dr. Andrei Mărcuș

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<sup>2</sup> Keep only the labels that, according to the [Procedure for applying ODD labels in the academic process](#), suit the discipline and delete the others, including the general one for *Sustainable Development* – if not applicable. If no label describes the discipline, delete them all and write „*Not applicable.*”.