

## SYLLABUS

### RESEARCH PROJECT IN APPLIED COMPUTATIONAL INTELLIGENCEW

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	Computer Science
1.4. Field of study	Computer Science
1.5. Study cycle	Master
1.6. Study programme/Qualification	Applied Computational Intelligence
1.7. Form of education	Full time studies

#### 2. Information regarding the discipline

2.1. Name of the discipline		Research Project in Applied Computational Intelligence				Discipline code		MME9010			
2.2. Course coordinator					Prof. dr. Horia F. Pop						
2.3. Seminar coordinator					Prof. dr. Horia F. Pop						
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	3	of which: 3.2 course	0	3.3 seminar/laboratory/project	3
3.4. Total hours in the curriculum	36	of which: 3.5 course	0	3.6 seminar/laboratory/project	36
<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)					24
Additional documentation (in libraries, on electronic platforms, field documentation)					24
Preparation for seminars/labs, homework, papers, portfolios and essays					36
Tutorship					24
Evaluations					6
Other activities					-
3.7. Total individual study hours	114				
3.8. Total hours per semester	150				
3.9. Number of ECTS credits	6				

#### 4. Prerequisites (if necessary)

4.1. curriculum	Computer Science Research Methodology
4.2. competencies	-

#### 5. Conditions (if necessary)

5.1. for the course	-
5.2. for the seminar /lab activities	None

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

<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.

<b>Professional/essential competencies</b>	<ul style="list-style-type: none"> <li>• <i>understanding and working with basic concepts in computational intelligence;</i></li> <li>• <i>ability to approach and solve complex problems using various techniques of computational intelligence;</i></li> </ul>
<b>Transversal competencies</b>	<ul style="list-style-type: none"> <li>• <i>capability of information analysis and synthesis;</i></li> <li>• <i>etic and fair behaviour, commitment to professional deontology;</i></li> </ul>

## 6.2. Learning outcomes

<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• <i>The graduate has the necessary knowledge to devise, model and design of complex software applications in the field of computational intelligence</i></li> <li>• <i>The graduate possesses the fundamental knowledge for modelling, being able to analyse real life problems and to translate them in concrete requirements and to design a corresponding software model</i></li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• <i>The graduate can use specific language and terminology for the field of computational intelligence being able to communicate and interact with members of a team</i></li> <li>• <i>The graduate proves the capacity to reflect over own learning resources</i></li> </ul>
<b>Responsibility and autonomy:</b>	<ul style="list-style-type: none"> <li>• <i>The graduate proves knowledge related to specifying the requirements of research activities in the domain of computer science in general and computational intelligence in particular and he/she understands the role of research in promoting progress</i></li> <li>• <i>The graduate knows and respects the ethical and legal principles and rules in scientific research</i></li> </ul>

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

<b>7.1 General objective of the discipline</b>	<p><i>This research project represents the individual work the student performs with the purpose to realize a scientific report on a given research topic.</i></p> <p><i>This research project is associated to the internship project: the research project is the scientific and experimental documentation</i></p>
<b>7.2 Specific objective of the discipline</b>	<p><i>At the completion of this course, the student should:</i></p> <ul style="list-style-type: none"> <li>- <i>have documentation abilities on an established topic</i></li> <li>- <i>be able to design the table of contents of the research report</i></li> <li>- <i>know how to write a technical document (research report) in many iterations</i></li> </ul>

## 8. Content

<i>8.1 Course</i>	<i>Teaching methods</i>	<i>Remarks</i>
<i>8.2 Seminar / laboratory</i>	<i>Teaching methods</i>	<i>Remarks</i>
<i>1. Establishing the research title/topic</i>	<i>Conversation, debate, case studies</i>	

2. Bibliographical documentation	Conversation, debate, case studies	
3. Table of contents: version 1.0	Conversation, debate, case studies	
4. Relevance of the bibliographical sources and their assignment to the designed structure	Conversation, debate, case studies	
5. Detecting possible original contribution; discussion and decision on experimental modelling	Conversation, debate, case studies	
6. Processing of selected documents and writing the paper – first draft of the research report	Conversation, debate, case studies	
7. Final form of the research report	Evaluation	
Bibliography - to be decided by student based on his/her research topic - Internet resources on software projects and on the particular topics of the projects		

### 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;

Graduating a master program assumes experience in developing a research project

### 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 ability to write a research report and present the obtained results.	Each of the activities has a due date and a corresponding mark, on a 10-point scale. A penalty of 1pt per week are considered for delays.	
		1. title and table of contents 2. bibliographical documentation 3. contents v1.0 4. relevance of references, assignment to structure 5. original and experimental contribution 6. full text of the report	10% 10% 10% 20% 10% 20%
10.6 Minimum standard of performance			
At least grade 5 (from a scale of 1 to 10)			

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

<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.”.

*Not applicable.*

*Date:*  
*10/4/2025*

*Signature of course coordinator*

*Prof. dr. Horia F. Pop*

*Signature of seminar coordinator*

*Prof. dr. Horia F. Pop*

*Date of approval:*  
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*Signature of the head of department*

*Assoc.prof.phd. Adrian STERCA*