COURSE DESCRIPTION

Research Project in Artificial Intelligence for Connected Industries

Academic year 2026/2027

1. Programme-related data

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	**Computer Science**
1.5. Level of study	**Master**
1.6. Degree programme / Qualification	**Artificial Intelligence for Connected Industries**
1.7. Form of education	**Full time studies**

2. Course-related data

2.1. Course title	**Research Project in Artificial Intelligence for Connected Industries**			Course code	**MME8222**
2.2. Course coordinator	Prof. dr. Camelia Chira				
2.3. Seminar coordinator	Prof. dr. Camelia Chira				
2.4. Year of study	2	2.5. Semester	4	2.6. Type of assessment	Viva voce
2.7. Course status	Compulsory			2.8. Course type	Specialisation subject

3. Total estimated time (hours per semester of teaching activities)

3.1. Number of hours per week	**3**	of which: 3.2. course	**0**	3.3. seminar/ laboratory/ project	**3**
3.4. Total of hours in the curriculum	**36**	of which: 3.5. course	**0**	3.6. seminar/ laboratory	**36**
Time allocation for individual study (IS) and self-taught activities (ST)					**hours**
Learning from textbooks, course materials, bibliography, and notes (IS)					24
Additional research in the library, on subject-specific electronic platforms, and on-site					24
Preparing seminars/ laboratories/ projects, assignments, reports, portfolios, and essays					36
Tutoring (professional guidance)					24
Examinations					6
Other activities					
3.7. Total hours of individual study (IS) and self-taught activities (ST)				**114**	
3.8. Total hours per semester				**150**	
3.9. Number of credits				**6**	

4. Prerequisites (where applicable)

4.1. curriculum-related	Computer Science Research Methodology
4.2 skills-related	-

5. Specific conditions (where applicable)

5.1. course-related	-
5.2. seminar/laboratory-related	None

6.1. Competencies resulting from the completion of the degree programme *(as referred to in the curriculum)*[1]

Professional competencies	
Competency code	**Competency**
PC8	Use application-specific interfaces
PC10	Develop software prototype
PC16	Solve ICT system problems
PC24	Perform scientific research
PC32	Keep up with the latest information systems solutions
Transversal competencies	
Competency code	**Competency**
TC1	Think analytically
TC3	Work in teams
TC4	Solve problems

6.2. Learning outcomes relevant to the degree programme (as referred to in the curriculum)[2]

Learning outcomes targeted by the subject		
Competency code	**Knowledge and comprehension**	**Specific academic skills**
PC8	The graduate possesses the fundamental knowledge in automatics and robotics, advanced networks architectures and IoT systems, being able to use and apply this knowledge to produce new relevant solutions.	The graduate knows and respects the ethical and legal principles and rules in scientific research.
PC10	The graduate has the necessary knowledge to devise, model and design of complex software applications in the field of artificial intelligence for connected industries.	The graduate has the ability to perform educational activities in the domain of algorithmics and programming for schools and high schools.
PC16	The graduate possesses fundamental knowledge in modelling which allows the analysis of problems from industry, transforming them into concrete requirements and developing relevant software models.	The graduate is able to carry on activities for education and training on different topics related to software systems, artificial intelligence, automatics, robotics and networks.
PC24	The graduate possesses the fundamental knowledge in automatics and robotics, advanced networks architectures and IoT systems, being able to use and apply this knowledge to produce new relevant solutions.	The graduate proves knowledge related to specifying the requirements of research activities in the domain of computer science in general and the domain of artificial intelligence and its applications for connected industrues in particular and he/she understands the role of research in promoting progress.

[1] The professional and/or transversal skills targeted by the subject for which the course description is prepared will be copied from the curriculum of the degree programme. For each competency, the complete entry, including the competency code, will be copied with the exact wording that appears in the curriculum, without any changes. If no competency is copied from either of the two categories, the row corresponding to that category is deleted from the table.

[2] The learning outcomes relevant for the degree programme and targeted by the subject for which the course description is prepared will be listed. The entries, copied without any changes from the Curriculum by subject type (Core Subject/Specialisation Subject/Complementary Subject), are listed under the corresponding competency.

PC32	The graduate proves advance programming skills which will allow learning, accumulating solid knowledge and rapid understanding of modern technologies.	
TC1	The graduate has the necessary knowledge to devise, model and design of complex software applications in the field of artificial intelligence for connected industries.	The graduate has the ability to perform educational activities in the domain of algorithmics and programming for schools and high schools.
TC3	The graduate proves advance programming skills which will allow learning, accumulating solid knowledge and rapid understanding of modern technologies.	
TC4	The graduate proves advance programming skills which will allow learning, accumulating solid knowledge and rapid understanding of modern technologies.	

7. Subject-specific learning outcomes

Knowledge and comprehension
The graduate has the necessary knowledge to explore research topics and analyse specialized literature in the field of artificial intelligence for connected industries.
The graduate possesses fundamental knowledge of modelling and development through which he/she analyses a research topic, identifies relevant objectives that he/she translates into concrete requirements and develops an appropriate software solution.
Specific academic skills
The graduate is able to create a technical documentation and write a research report on a specific topic.
The graduate demonstrates skills in analysing the specific requirements of the research approach in the field of artificial intelligence for connected industries and understands the role of research in promoting progress.
The graduate knows and respects the ethical and legal principles and rules in scientific research.

8. Contents

8.1. Course	**Teaching and learning methods**	**Remarks[3]**
8.2. Seminar/ laboratory	**Teaching and learning methods**	**Remarks**
1. Establishing the research title/topic	Conversation, debate, case studies	
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	

[3] For example, organisational aspects, recommendations for students, specific aspects relating to the course/seminar, such as inviting experts in the field, etc.

6. Processing of selected documents and writing the paper – first draft of the report	Conversation, debate, case studies	
7. Final form of the research report	Conversation, 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. Evaluation

Type of activity	9.1 Evaluation criteria[4]	9.2 Evaluation methods[5]	9.3 Percentage in the final grade
9.4. Course			
9.5. 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 is considered for delays.	
		Portfolio:3 research reports • Report 1: title and table of contents, week 4 • Report 2: bibliographical documentation, relevance, assignment to structure, week 6 • Report 3: full text of the report, week 10 Final presentation	10% 20% 20% 50%
9.6 Minimum standard for passing			
At least grade 5 (from a scale of 1 to 10)			

10. SDG labels (Sustainable Development Goals)[6]

		Sustainable Development Generic Label

[4] The evaluation criteria must directly reflect the learning outcomes targeted at the level of the degree programme respectively at the level of the subject. More specifically, the learning outcomes set out in the expected learning outcomes are assessed.

[5] Both final evaluation methods and ongoing evaluation strategies should be established.

[6] Select a single label which, according to the *Implementation of SDG labels in the academic process*, best matches the subject. If the subject addresses sustainable development in a generic manner (i.e. by presenting/introducing the general framework of sustainable development, etc.), then the Sustainable Development generic label may be applied. If none of the labels describe the subject, select the last option: *"No label applies."*

								
○	○	○	○	○	○	○	○	●
								No label applies
○	○	○	○	○	○	○	○	○

Date of entry:
12/05/2026

Signature of course coordinator

Prof. dr. Camelia Chira

Signature of seminar coordinator

Prof. dr. Camelia Chira

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

Conf. dr. Adrian STERCA