SYLLABUS

1. Data about the program of study

1.1 Institution	The Technical University of Cluj-Napoca
1.2 Faculty	Faculty of Automation and Computer Science
1.3 Department	Computer Science
1.4 Field of study	Computer Science and Information Technology
1.5 Cycle of study	Master of Science
1.6 Program of study / Qualification	Data Science / Master
1.7 Form of education	Full time
1.8 Subject code	12.00

2. Data about the subject

2.1 Subject name				***Research Activity 2***		
2.2 Subject area				Artificial Intelligence		
2.2 Course responsible/lecturer				Not necessary.		
2.3 Lecturers / Teachers in charge with seminars / labs./ projects				Not necessary.		
2.4 Year of study	I	2.5 Semester	2	2.6 Assessment	E–exam, C–colloq., V-verif.	C
2.7 Subject category	Formative category: DA – advanced, DS – speciality, DC – complementary					DS
	Optionality: DI – imposed, DO – optional (alternative), DF – optional (free choice)					DI

3. Estimated total time

3.1 Number of hours per week	14	of which:	Course	-	Seminar	-	Laborator	-	Proiect	14
3.4 Total hours in the curriculum	196	of which:	Course	-	Seminar	-	Laborator	-	Proiect	196
3.7 Individual study:										
(a) Manual, lecture material and notes, bibliography										
(b) Supplementary study in the library, online and in the field										10
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays										25
(d) Tutoring										15
(e) Exams and tests										4
(f) Other activities										-

3.8 Total hours of individual study (summ (3.7(a)…3.7(f)))	54
3.9 Total hours per semester (3.4+3.8)	250
3.10 Number of credit points	10

4. Pre-requisites (where appropriate)

4.1 Curriculum	Research Activity 1
4.2 Competence	Related to the discipline above

5. Requirements (where appropriate)

5.1 For the course	It's not necessary
5.2 For the seminar / laboratory / project	Computers, equipment and specific software

6. Specific competences

6.1 Professional competences	**C3** - Specification, analysis, modeling, design, verification, testing, validation, and maintenance of advanced artificial intelligence and vision systems and software components, using field-specific tools • **C3.1** - Demonstrating knowledge of the domain, programming environments, and concepts of artificial intelligence and vision systems • **C3.2** - Analysis of the interactions and mode of operation of the components of complex artificial vision systems proposed in the scientific literature • **C3.3** - Analysis, modeling and innovative design of artificial intelligence and vision systems, of related hardware and software components • **C3.4** - Comparative, synthetic, including experimental evaluation of solution alternatives for performance optimization, based on usability criteria • **C3.5** - Developing and implementing original solutions for domain-specific problems, starting from a set of informally specified requirements **C4** - Contextual integration and integrity of complex artificial intelligence and vision systems • **C4.1** - Demonstration of knowledge and understanding of interoperability and integration elements specific to artificial intelligence and vision systems, taken both as a whole and on modules • **C4.2** - Using interdisciplinary knowledge to adapt complex intelligence and artificial vision systems in relation to the dynamic requirements of the application field • **C4.3** - The combined use of classic and original principles and methods for the integration of the components of artificial intelligence and vision systems • **C4.4** - The use of quality, safety and security standards in information processing and in the integration of complex intelligence and artificial vision systems • **C4.5** - Realization of interdisciplinary projects, including problem identification and analysis, elaboration of specifications, software design, implementation of functional testing and evaluation of specific quality, security and performance criteria, as well as validation of the integrated artificial intelligence and vision system
6.2 Cross competences	NA

7. Discipline objectives (as results from the *key competences gained*)

7.1 General objective	Development of research and design skills and competencies in the field of intelligence and artificial vision, computers and information technology
7.2 Specific objectives	Assimilation of knowledge and skills regarding: • elaboration of the general scheme or the architecture of the artificial intelligence and vision system to be developed • performing experiments, tests and checks • stating some working hypotheses and validating them through

	experiments • designing the components of an application system

8. Contents

8.1 Lectures	Hours	Teaching methods	Notes
Not necessary			
Bibliography: Not necessary			
8.2 Applications / Laboratory / Project	Hours		
Establishing the theme of the dissertation project;		Individual work and periodic checks	10 credits
Establishing the main chapters;			
Documentation on the dissertation topic;			
Creating a synthesis regarding the bibliographic documentation			
Bibliography: Establishd by each advisor in accordance with the research topics			

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

It is carried out through periodic meetings with representatives of the economic environment

10. Evaluation

Activity type	Assessment criteria	Assessment methods	Weight in the final grade
Course	Not necessary		
Applications (Seminars /Laboratory /**Project)**	Based on the practical results and the elaborated report	Oral examination, Report evaluation	60% 40%
Minimum standard of performance: Average 5			

Date of filling in: 26.02.2025	**Responsible**	**Title First name Last name**	**Signature**
	Course	-	
	Applications	-	

Date of approval in the department 17.09.2025	Head of department, Prof.dr.eng. Rodica Potolea
Date of approval in the faculty council 19.09.2025	Dean, Prof.dr.eng. Vlad Mureșan