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
1.6Program of study/Qualification	Data Science / Master
1.7 Form of education	Full time
1.8 Subject code	19.00

2. Data about the subject

2.1 Subject name				***Research Activity 3***		
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	II	Semester	3	Assessment	E–exam, C–colloq., V-verif.	V
2.7 Subject category	Formative category: DD–**d**eepening, SD–**s**ynthesis, CD–**c**omplementary					SD
	Optionality: MD-**m**andatory, ED-**e**lective, OD-**o**ptional					MD

3. Estimated total time

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

3.4 Total hours of individual study (summ (3.7(a)…3.7(f)))	29
3.5 Total hours per semester (3.4+3.8)	225
3.6 Number of credit points	9

4. Pre-requisites (where appropriate)

4.1 Curriculum	Research Activity 1 and 2
4.2 Competence	Related to the disciplines 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	**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 **C5** - The creative combination of multidisciplinary knowledge in the field of computer science and information technology in order to research, specify, design, optimize, implement, test and evaluate original theories, algorithms, techniques, methods and methodologies specific to complex artificial intelligence and vision systems. • **C5.1** - Demonstrated knowledge of artificial intelligence and vision systems research, design, implementation, optimization and testing methodologies • **C5.2** - Demonstrating the ability to analyze and interpret new situations through the prism of fundamental knowledge in the field of computers and information technology • **C5.3** - The creative combination, based on the discovery of new semantic and functional links, of various modern design principles in the field of computers and information technology to solve optimization problems • **C5.4** - Basing the research activity and innovative design in the field of computers on correct evaluation criteria • **C5.5** - Carrying out research activities with practical purpose demonstrated through functional software and / or hardware prototypes
6.2 Cross competences	N/A

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: • detailed design of the components of the application system • implementation of application system components • elaboration of the design and implementation documentation • elaboration of a scientific paper

8. Contents

8.1. Lecture (syllabus)	Hours	Teaching methods	Notes
Bibliography: Not necessary			
8.2 Applications - Seminars / Laboratory / Project	Hours	Teaching methods	Notes
Realization of a theoretical, experimental, numerical model;			
Carrying out a preliminary study			
Documentation on the dissertation topic;			
Creation of a report summarizing the activities carried out.			
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