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	Automation
1.4	Field of study	Systems engineering
1.5	Cycle of study	Master
1.6	Program of study/Qualification	Cyber-physical systems
1.7	Form of education	IF - Full time
1.8	Subject code	12.00

2. Data about the subject

2.1	Subject name			Research Cyber-physical systems 2			
2.2	Subject area			Systems engineering			
2.2	Course responsible/lecturer			Not necessary			
2.3	Teachers in charge of seminars			The student's scientific supervisor			
2.4 Year of study	1	2.5 Semester	2	2.6 Assessment			V
2.7 Subject category	Formative category						DS
	Optionality						DI

3. Estimated total time

3.1 Number of hours per week	14	of which	3.2 Course	0	3.3 Seminar	0	3.3 Laboratory	0	3.3 Project	14
3.4 Total hours in the curriculum	196	of which	3.5 Course	0	3.6 Seminar	0	3.6 Laboratory	0	3.6 Project	196
3.7 Individual study:										
(a) Manual, lecture material and notes, bibliography										
(b) Supplementary study in the library, online and in the field										
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays										
(d) Tutoring										
(e) Exams and tests										2
(f) Other activities										54
3.8 Total hours of individual study (sum (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	Not necessary
4.2	Competence	Use of fundamental automation concepts

5. Requirements (where appropriate)

5.1	For the course	Not necessary
5.2	For the applications	Not necessary

6. Specific competences

Professional competences	Realization of professional and/or interdisciplinary research-development projects in compliance with quality, safety and security standards
Cross competences	Team work Scientific dissemination of results

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

7.1	General objective	- Training of young engineers, researchers and developers; - Supporting master students in the proper preparation of dissertations, research projects, dissemination of results; - Presentation of the main methodological aspects in scientific research and innovation (RDI): terminology specific to the field of RDI, research - development and industrial activity, general definitions of the Romanian RDI system; - Acquiring and implementing in current practice the performance in the research activity: the typology of scientific research and methods of collecting scientific research data, the stages of a scientific research, research projects
7.2	Specific objectives	- Involvement of master students in fundamental and/or applied research activities related to the scientific research grants of the department, by solving practical tasks. - Acquiring the skills related to the research activity that corresponds to the master program - Management of research projects and knowledge of legislation in the field - Elaboration of ways of disseminating the results in the form of conference or journal papers

8. Contents

8.1. Lecture (syllabus)	Number of hours	Teaching methods	Notes
Not necessary			
Bibliography			
8.2. Seminars /Laboratory/Project	Number of hours	Teaching methods	Notes

Under the guidance of the coordinating teaching staff		Presentation of examples, discussions, practical applications	In case of force majeure, the online Teams platform will be used
Bibliography			

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

• The discipline meets the current requirements of development and evolution on a national and international level of higher technical education in the field of Systems Engineering;
• The students are provided with skills related to the needs of the current qualifications, a scientific and technical training corresponding to the master's level, which will allow them to quickly enter the labor market after graduation, but also the possibility of continuing their studies through doctoral programs;
• The study program is included in the policy and strategy of the Technical University of Cluj-Napoca, both in terms of content and structure, as well as in terms of learning outcomes and openness offered to students on the job market in Systems Engineering.

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
10.4 Course	Not necessary	Not necessary	
Project/Research	The content, complexity, originality, technical solutions used, innovation, practical results of the project	Grading of the research report based on the overall activity and oral presentation at the colloquium	100%
10.6 Minimum standard of performance			
Passed			

Date of filling in:		Title Surname Name	Signature
15.03.2023	Lecturer		
	Teachers in charge of application		

Date of approval in the department of Automation	Head of department Prof.dr.ing. Honoriu Vălean
Date of approval in the faculty of Automation and Computer Science	Dean Prof.dr.ing. Liviu Miclea