SYLLABUS

1. Program data

1.1 Higher education institution	Technical University of Cluj-Napoca
1.2 Faculty	Road Vehicles, Mechatronics and Mechanics
1.3 Department	Road Vehicles and Transport
1.4 Field of study	Automotive Engineering
1.5 Study cycle	Master's Degree
1.6 Study program / Qualification	Advanced Techniques in Automotive Engineering (English) /Engineer
1.7 Form of education	IF – full-time education

2. Data about the discipline

2.1 Name of the discipline	Research Activity 2			Code of Discipline	12.00
2.2 Course holder					
2.3 Head of seminar/laboratory/project/practical activities					
2.4 Year of study	1	2.5 Semester	2	2.6 Type of Assessment	V
2.7 Discipline regime	Formative category				DF
	Optionality				DOB

3. Total estimated time

3.1 Number of hours per week	14	of which:	3.2 Lecture	0	3.3 Seminary	0	3.3 Laboratory	0	3.3 Project	0	3.3 Practice	14
3.4 Number of hours per semester	196	of which:	3.5 Lecture	0	3.6 Seminary	0	3.6 Laboratory	0	3.6 Project	0	3.3 Practice	196

3.7 Distribution of time (hours per semester) for individual study and assessment:	
(a) Assessment	2
(b) Studying according to the textbook, course material, bibliography and notes	-
(c) Additional documentation in the library, on specialized electronic platforms and in the field	52
(d) Preparation of seminars / laboratories, assignments, papers, portfolios and essays	-
(e) Tutoring	-
(f) Other activities	-
3.8 Total hours of individual study and assessment (sum of (3.7(a)…3.7(f))	54
3.9 Total hours per semester (3.4+3.8)	250
3.10 Number of credits	10

4. Preconditions (where applicable)

4.1 Curriculum	
4.2 Skills	

5. Conditions (where applicable)

5.1. Lecture delivery	
5.2. Seminar / laboratory / project delivery	

6. Specific skills acquired

Professional skills	Be able to draw up a research plan; To carry out documentation using an indexed international database (SCOPUS); Develop the main chapters of a research paper.
Transversal skills	Applying multidisciplinary teamwork and multidisciplinary work techniques on different hierarchical levels within working groups - specific project management; Appropriate use of effective learning methods and techniques; adequate use of information and oral and written communication.

7. Expected learning outcomes

Knowledge	The student/graduate demonstrates advanced knowledge of artificial intelligence fundamentals, automotive automation systems, auxiliary systems of internal combustion engines, and in-vehicle communication networks, integrating these concepts into an independent research activity. The student/graduate understands modern research methodologies, engineering analysis techniques, and scientific documentation required for solving complex automotive engineering problems.
Skills	The student/graduate applies advanced engineering methods, software tools, and scientific research techniques to investigate, analyze, and solve complex problems related to automotive systems. The student/graduate integrates knowledge acquired from multiple disciplines to develop, validate, and present an original research project using appropriate engineering methodologies.
Responsibility and autonomy	The student/graduate independently plans, organizes, and carries out a research activity, demonstrating responsibility for the quality, accuracy, and scientific integrity of the obtained results. The student/graduate critically evaluates engineering solutions, justifies technical decisions based on scientific evidence, and communicates research results effectively while respecting professional ethics and academic integrity.

8. The objectives of the discipline (based on the grid of specific competencies acquired)

8.1 General objective of the discipline	Acquiring knowledge about research
8.2 Specific objectives	Elaboration of the main chapters of a research paper; Be familiar with Internet browsing tools; Acquiring bibliographic search tools in international databases

9. Content

9.1 Lecture	**Hrs.**	**Teaching methods**	**Observation**

9.2 Seminar / laboratory / project / practice	**Hrs.**	**Teaching methods**	**Observation**
1. Establishing the theme of the dissertation project.	2	Practical exercises, demonstrations, modeling, and computer-aided simulation.	
2. Establish the main chapters.	2		
3. Documentation on the theme of dissertation	82		
4. Making a synthesis of bibliographic documentation.	110		
Bibliography:			

9.2 Seminar / laboratory / project / practice	Hrs.	Teaching methods	Observation
1. 5 titles, established together with the tutor			

10. Correlating the content of the discipline with the expectations of representatives of the epistemic community, professional associations and representative employers in the field related to the program

The content of the discipline is in line with the concerns of the companies in the field and the current directions of scientific research.

11. Evaluation

Activity	11.1 Assessment criteria	11.2 Assessment methods	11.3 Weight of final grade
11.4 Lecture	-	-	-
11.5 Seminar/Laboratory /Project / Practice	The exam consists of checking the synthesis report of the activities carried out	Oral and written evaluation	100%
11.6 Minimum Performance Standard For the synthesis report of the activities carried out, minimum grade 5(five)			

Date of completion	Responsible	Grade, Title, Second name First NAME	Signature
09.07.2026	Lecture		
	Teachers in charge of application (masters program responsible)	*Prof. PhD. Eng. Bogdan VARGA*	

Date of approval in the ART Department Council 24.07.2026 _____	ART Department Director Prof.dr.ing. Barabás István
Date of approval in the ARMM Faculty Council 16.09.2026 _____	Dean, Prof.dr.ing. Filip Nicolae