PRACTICAL WORK SYLLABUS [1]

1. Information about the program

1.1 Higher education institution	**Politehnica University Timisoara**
1.2 Faculty [2] / Department [3]	ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGIES / Applied Electronics
1.3 Field of study (name/code[4])	Electronics, Telecommunications and Information Technologies Engineering /202010
1.4 Study cycle/Type of study program [5]	Master / Research Master
1.5 Study program (name/code/qualification)	AUTOMOTIVE ELECTRONIC SYSTEMS/ 20/20/10 / 2152

2. Information about discipline

2.1a Type of practical work[6]			Research practice 3				
2.1b Type of practical work in Romanian			Practică de cercetare 3				
2.2 Coordinator (holder) of applied activities [7]			Prof. dr. ing. Gontean Aurel				
2.3 Year of study [8]	2	**2.4** Semester	3	**2.5** Type ofe evaluation	V	**2.6** Regime of discipline [9]	DOB
2.7 Academic year[10]	2025-2026	**2.8.** Cod of discipline	M239.25.01.S6				

3. Total estimated time (direct practical activities, partially assisted activities)

3.1 Number of hours fully assisted/week	10
3.2 Total number of hours fully assisted/sem.	14.29
3.3 No. of credits	8

4. Prerequisites (where applicable)

4.1 Curriculum	• The topics addressed in the previous semester within the course Research Practice 2 are continued, and a related or interdisciplinary research area may be selected .
4.2 Learning outcomes	• Not the case

5. Mission of the Practical Work and conditions for its accomplishment[10]

5.1 Mission	• The development of the student's research skills.
5.2 Conditions required to carry out the practical work	• It is carried out in the institution's own laboratories, in research laboratories, or in partnership with the relevant industrial sector.

6. Learning outcomes [11] acquired through practical work in accordance with the mission

Knowledge	• C9. The student/graduate demonstrates advanced knowledge of the operating principles and integration of microsystems and MEMS. • C10. The student/graduate explains design methods and fabrication techniques used in the development of electronic, mechanical, and optical microsystems. • C11. The student/graduate understands the analysis and characterization processes of microsystems, including testing and validation techniques. • C12. The student/graduate identifies the regulations, standards, and risks associated with the research and production of microsystems, including environmental protection aspects. • C13. The student/graduate demonstrates advanced knowledge of power electronics principles, conversion circuits, and their applications in industrial and energy systems. • C14. The student/graduate explains methods and techniques for modeling power electronic systems, including the analysis of their components and interactions.

Skills	• A13. The student/graduate applies testing procedures for electronic products and systems, evaluating their compliance and reliability. • A14. The student/graduate integrates automation technologies into industrial manufacturing and monitoring processes. • A15. The student/graduate analyzes and interprets experimental and operational data to optimize the performance of industrial equipment. • A16. The student/graduate synthesizes scientific and technical information from interdisciplinary fields relevant to microsystems. • A17. The student/graduate presents analysis results through technical reports and scientific communications, using modern representation and visualization tools. • A18. The student/graduate designs and develops microsystems using dedicated simulation and modeling tools .
Responsibility and autonomy	• RA9. The student/graduate coordinates multidisciplinary teams for the design, implementation, and testing of monitoring systems. • RA10. The student/graduate evaluates the economic, technological, and environmental impact of monitoring equipment on industry. • RA11. The student/graduate assumes responsibility for the accuracy and quality of the analyses and results obtained in microsystems research. • RA12. The student/graduate demonstrates autonomy in designing and implementing innovative MEMS solutions. • RA13. The student/graduate coordinates and contributes to research and development teams, promoting collaboration and knowledge exchange. • RA14. The student/graduate assumes responsibility for the quality of the design and testing of power electronic systems, ensuring compliance with technical and safety standards.

7. Objectives of the discipline (related to the learning outcomes presented at point 6)

- Development of the student's research skills
- Identification and accurate formulation of the previously chosen topic
- Evaluation of existing aspects in the field of the topic and the proposal of further developments
- Identification of areas where specific innovative solutions can be introduced
- Understanding the principles for preparing a research report
- Carrying out the management of the research project
- Writing and publishing a scientific article
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8. Topics and activities for practical work[12]

8.1 Topics for practical work	
Documentation and critical analysis of the current state of the art in the field of a specific research topic. A topic specific to the field, established through dialogue with the supervisor, possibly selected from a list of topics proposed by the academic staff involved in this master's program or by partner companies.	
8.2 Type of activities	**8.3** Duration
Scientific analysis and writing, implementation, presentation, and management of the research activity carried out through: -partially assisted activities	140

9. Student's assignments[13]

10. Evaluation

10.1 Evaluation criteria	**10.2** Evaluation methods	**10.3** Share of the final grade
Knowledge of specialized concepts and terminology	Examination by the supervisor	1/3
Deepening the research methodology	Examination by the supervisor	1/3

Analytical capacity. The format for writing the report	Examination by the supervisor	1/3
10.4 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified[14])		
• The student will be able to develop and comparatively analyze a solution to a research problem, including validating it through simulation or experiment.		

Date of approval in the Faculty Council[15] **Date of completion**

26.09.2025

Dean **Head of Department** **Coordinator of applied activities**

(signature) **(signature)** **(signature)**