Universitatea Naţională de Ştiinţă şi Tehnologie Politehnica Bucureşti
Facultatea de Electronică, Telecomunicaţii şi
Tehnologia Informaţiei

COURSE DESCRIPTION

1. Program identification information

1.1 Higher education institution	**National University of Science and Technology Politehnica Bucharest**
1.2 Faculty	**Electronics, Telecommunications and Information Technology**
1.3 Department	**Electronic Devices, Circuits and Architectures**
1.4 Domain of studies	Electronic Engineering, Telecommunications and Information Technology
1.5 Cycle of studies	Masters
1.6 Programme of studies	Advanced Computing in Embedded Systems

2. Date despre disciplină

2.1 Course name (ro) (en)				Modul de cercetare ştiinţifică I Module of scientific research I			
2.2 Course Lecturer							
2.3 Instructor for practical activities				S.l. Dr. Ing. George-Vlăduţ Popescu			
2.4 Year of studies	1	2.5 Semester	1	2.6. Evaluation type	V	2.7 Course regime	Ob
2.8 Course type		S	2.9 Course code	7		2.10 Tipul de notare	Nota

3. Total estimated time (hours per semester for academic activities)

3.1 Number of hours per week	12	Out of which: 3.2 course	0.00	3.3 seminary/laboratory	12
3.4 Total hours in the curricula	168	Out of which: 3.5 course	0	3.6 seminary/laboratory	168
Distribution of time:					hours
Study according to the manual, course support, bibliography and hand notes Supplemental documentation (library, electronic access resources, in the field, etc) Preparation for practical activities, homework, essays, portfolios, etc.					244
Tutoring					4
Examinations					2
Other activities (if any):					0

3.7 Total hours of individual study	82.00
3.8 Total hours per semester	250
3.9 Number of ECTS credit points	10

4. Prerequisites (if applicable) (where applicable)

4.1 Curriculum	-
4.2 Results of learning	-

5. Necessary conditions for the optimal development of teaching activities (where applicable)

5.1 Course	-
5.2 Seminary/ Laboratory/Project	-

6. General objective *(Reffering to the teachers' intentions for students and to what the students will be thought during the course. It offers an idea on the position of course in the scientific domain, as well as the role it has for the study programme. The course topics, the justification of including the course in the currcula of the study programme, etc. will be described in a general manner)*

The objective of the discipline is to acquaint students both with scientific and technical documentation and information activities, as well as with the solution of fundamental scientific research problems related to the dissertation work in areas such as:

- Computer architectures

- Parallel computing and specific architectures

- Circuit design using High-Level Synthesis

- Artificial intelligence: architectures, methods, applications

- Image processing applications

- Human-machine interfaces.

7. Competences *(Proven capacity to use knowledge, aptitudes and personal, social and/or methodological abilities in work or study situations and for personal and proffesional growth. They refflect the empolyers requirements.)*

Specific Competences	– Concepts of medium complexity in the chosen field of research. – Drawing up a research plan. – Accessing international databases and scientific articles. – Understanding the theoretical and applied notions involved in the research topic. – Oral and written communication in a foreign language (English)
Transversal (General) Competences	– Communicates effectively and collaborates with everyone involved in the research activity. – Ability to think in scientific terms, search and analyze data independently, identify solutions, and draw and present conclusions. – Presents the acquired knowledge in a synthetic way. - Respects the principles of academic ethics (correct citation of sources, correct presentation of results).

8. Learning outcomes *(Synthetic descriptions for what a student will be capable of doing or showing at the completion of a course. The learning outcomes reflect the student's acomplishments and to a lesser extent the teachers' intentions. The learning outcomes inform the students of what is expected from them with respect to performance and to obtain the desired grades and ECTS points. They are defined in concise terms, using verbs similar to the examples below and indicate what will be required for evaluation. The learning outcomes will be formulated so that the correlation with the competences defined in section 7 is highlighted.)*

Knowledge	*The result of knowledge aquisition through learning. The knowledge represents the totality of facts, priciples, theories and practices for a given work or study field. They can be theoretical and/or factual.* – Correctly defines the basic notions and techniques in the chosen field of research. – Properly describes concepts, techniques used and results related to a new research topic, starting from the bibliographic synthesis of achievements in the field and the identification of current methods. – Learn how to approach, design and write a scientific documentation. – Highlights the relevant scientific aspects of the topic studied, correctly identifying both the difficulties of the subject and the limitations of the approaches communicated in the specialized literature. – Identifies new scientific solutions for solving problems in the studied field. – Is able to write a detailed scientific report correctly, according to international scientific standards.
Skills	*The capacity to apply the knowledge and use the know-how for completing tasks and solving problems. The skills are described as being cognitive (requiring the use of logical, intuitive and creative thinking) or practical (implying manual dexterity and the use of methods, materials, tools and intrumentation).* – Selects and groups relevant information in a given context, thus being able to adequately describe various theoretical or practical aspects of the chosen research field. – Uses the concepts specific to the field in a reasoned way, in order to correctly approach some problems. – Formulates correct conclusions on the methods and techniques used to achieve the tasks pursued, communicated in the literature, highlighting their advantages and limitations. – Proposes, develops and implements new solutions to solve the problems addressed.
Responsability and autonomy	*The student's capacity to autonomously and responsably apply their knowledge and skills.* – Select appropriate bibliographic sources and analyze them. – Respect the principles of academic ethics, correctly citing the bibliographic sources used. – Demonstrates responsiveness to new learning contexts. – Demonstrates collaboration with other colleagues and teaching staff in carrying out teaching activities. – Demonstrates autonomy in organizing the learning context and the problems to be solved. – Realizes the value of its contribution in the field of engineering to the identification of viable solutions to solve problems in social and economic life. – Demonstrates management skills in real-life situations (e.g. proper management of learning time).

9. Teaching techniques *(Student centric techniques will be considered. The means for students to participate in defining their own study path, the identification of eventual fallbacks and the remedial measures that will be adopted in those cases will be described.)*

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10. Contents

Bibliography:

11. Evaluation

Activity type	11.1 Evaluation criteria	11.2 Evaluation methods	11.3 Percentage of final grade
11.4 Course			

11.5 Seminary/laboratory/project	- Knowledge of concepts fundamentals about the sources of information in the field. - Evaluation of the mode of making the report scientific research both from point of view of the structure as well as information provided. - Ability to respond to pointed questions related to the research topic studied.	Oral evaluation	100
11.6 Passing conditions			
Minimum 50% of the total score			

12. Corroborate the content of the course with the expectations of representatives of employers and representative professional associations in the field of the program, as well as with the current state of knowledge in the scientific field approached and practices in higher education institutions in the European Higher Education Area (EHEA)

Through the activities carried out, students develop skills to offer solutions to problems and to propose improvement ideas for topics specific to the field of the master's program. Through the specific actions of a research topic, students acquire very useful skills both in industrial projects and in research groups.

Date	Course lecturer	Instructor(s) for practical activities
21.09.2026		S.l. Dr. Ing. George-Vlăduț Popescu

Date of department approval	Head of department
22.09.2026	Prof. Dr. Claudius Dan

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Date of approval in the Faculty Council	Dean
22.09.2026	Prof. Dr. Mihnea Udrea

