

COMENTARII referitoare la Anexa A1

1. Planul de învățământ pentru anul universitar 2026-2027 al domeniului de doctorat Ingineria Sistemelor, împreună cu Fișele disciplinelor au fost aprobate prin art 16 din Hotărârea Senatului Universitar nr. 10 din 16 iulie 2026 (https://www.upg-ploiesti.ro/wp-content/uploads/2026/07/S52_H10-Hotarare-Senat-16-iulie-2026.pdf)
2. Având în vedere caracterul oficial, aceste documente nu pot fi modificate și vor fi publicate pe pagina web a Școlii doctorale.
3. Atât *Planul de învățământ* cât și *Fișele disciplinelor* au fost realizate pe documente tipizate reglementate de Sistemul Calității (F 583.21/Ed.2, respectiv F 595.21/Ed.3)
4. **Prima parte a anexei** conține versiunea în Limba Română a *Planului de învățământ pentru domeniul de doctorat Ingineria Sistemelor pentru anul universitar 2026-2027* (document oficial)
5. **A doua parte a anexei** conține versiunea în Limba Engleză a *Planului de învățământ pentru domeniul de doctorat Ingineria Sistemelor pentru anul universitar 2026-2027*, în care pentru fiecare disciplină au fost introduși titularii și rezultatele învățării.

COMMENTS regarding Annex A1

1. The curriculum for the 2026-2027 academic year for the doctoral field of Systems Engineering, along with the course specifications (syllabi) was approved via Art. 16 of University Senate Decision No. 10 dated July 16, 2026 (https://www.upg-ploiesti.ro/wp-content/uploads/2026/07/S52_H10-Hotarare-Senat-16-iulie-2026.pdf)
2. Given their official status, these documents cannot be modified and will be published on the Doctoral School's webpage.
3. Both the *Curriculum* and the *course specifications (syllabi)* were prepared using standardized templates regulated by the Quality System (F 583.21/Ed.2 and F 595.21/Ed.3, respectively).
4. **The first part of the annex** contains the Romanian version of the curriculum for the doctoral field of Systems Engineering for the 2026-2027 academic year (official document).
5. **The second part of the annex** contains the English version of the curriculum for the doctoral field of Systems Engineering for the 2026-2027 academic year, in which the course instructors and learning outcomes have been included for each course.

PLANUL DE ÎNVĂȚĂMÂNT AL PROGRAMULUI DE STUDII AVANSATE

Nr. crt.	Disciplina	Total ore	Ore didactic	Ore studiu individual	Ore/sapt	Forma de evaluare	Nr. credite
	Discipline obligatorii						
1.	Etică și integritate academică	75	34	41	1	Examen	3
	Discipline de cunoaștere avansată						
2.	Conducerea automată în timp real	375	170	205	5	Examen	15
3.	Sisteme automate ierarhizate și distribuie	375	170	205	5	Examen	15
4.	Tehnici de inteligență artificială	375	170	205	5	Examen	15
5.	Sisteme inteligente fuzzy-hibride	375	170	205	5	Examen	15
6.	Modelarea și simularea dinamică a sistemelor	375	170	205	5	Examen	15
7.	Procesarea avansată a semnalelor numerice	375	170	205	5	Examen	15
8.	Tehnici avansate de cercetare operațională	375	170	205	5	Examen	15
9.	Sisteme cu evenimente discrete	375	170	205	5	Examen	15
10.	Complemente de teoria sistemelor	375	170	205	5	Examen	15
11.	Algoritmi avansați de reglare	375	170	205	5	Examen	15
	Discipline complementare						
12.	Managementul proiectelor	300	136	164	4	Examen	12
13.	Prelucrarea statistică a datelor	300	136	164	4	Examen	12
14.	Tehnici de achiziție, transfer și stocare a datelor	300	136	164	4	Examen	12
15.	Ingineria cunoașterii	300	136	164	4	Examen	12
16.	Soft Computing	300	136	164	4	Examen	12
17.	Metodologia cercetării	300	136	164	4	Examen	12
18.	Procesarea numerică a sunetului	300	136	164	4	Examen	12

Notă. Se va alege câte o disciplină din fiecare categorie.

Întocmit Cordonator Domeniu Ingineria Sistemelor,
 Prof.univ.dr.ing. Nicolae PARASCHIV

Avizat Director Școala Doctorală
 Prof.univ.habil.dr.ing. Timur Vasile CHIȘ

CURRICULUM OF THE ADVANCED STUDIES PROGRAMME

No.	Course	Total hours	Taught hours	Individual study hours	Hours /week	Assessment method	Credits	Course coordinator(s)
	Mandatory Courses							
1	Ethics and Academic Integrity	75	34	41	1	Exam.	3	Assoc. Prof., PhD Eng. Drumeanu Adrian Cătălin DRUMEANU

LEARNING OUTCOMES

Knowledge	1. Doctoral student understands the fundamental principles of academic and professional ethics; 2. Doctoral student identifies forms of academic integrity misconduct, including plagiarism, falsification and fraud; 3. Doctoral student explains the impact of ethical conduct in academic and professional settings; 4. Doctoral student describes the rules and regulations concerning copyright and the appropriate use of sources; 5. Doctoral student identifies and compares theories, models, methods, techniques and tools specific to concepts in the field of ethics and integrity; 6. Doctoral student identifies role-specific requirements, relevant professional standards and the fundamental concepts of academic ethics and integrity.
Skills	1. Doctoral student applies standards for correctly citing sources in academic work; 2. Doctoral student prepares academic and technical documents in compliance with integrity and ethics standards; 3. Doctoral student assesses the accuracy and reliability of information used in research and design activities; 4. Doctoral student analyses ethical dilemmas in academic and professional settings and argues for appropriate and responsible solutions; 5. Doctoral student applies principles and methodologies specific to professional development and scientific research in identifying and resolving issues in academic ethics and professional conduct; 6. Doctoral student relates to the professional standards and scientific research findings specific to the doctoral field and appropriately uses methods and criteria for evaluation, self-evaluation and analysis of feedback in order to assess the quality of their own work objectively.
Responsibility and autonomy	1. Doctoral student complies with academic ethics standards in all educational and professional activities; 2. Doctoral student demonstrates honesty and responsibility when preparing academic papers and technical projects; 3. Doctoral student promotes ethical conduct in academic and professional collaboration; 4. Doctoral student self-assesses compliance with the principles of ethics and integrity and corrects any deviations; 5. Doctoral student selects information sources relevant to a specific field and works both independently and in teams (including the assumption of roles and responsibilities, collaboration, cooperation and mutual support, awareness of how learning styles influence teamwork outcomes, learning from office or specialist colleagues, and appropriate multidisciplinary teamwork); 6. Doctoral student develops the ability to organise and coordinate work teams; 7. Doctoral student uses effective lifelong learning methods and techniques for continuing professional education and development.

	Advanced Knowledge Courses							
2	Real-Time Automatic Control	375	170	205	5	Exam..	15	Prof. PhD, Eng Nicolae PARASCHIV., Assoc. Prof. PhD, Eng Emil PRICOP.,
LEARNING OUTCOMES								
Knowledge		The doctoral student identifies and summarises fundamental concepts of real-time control and how they are applied to specific problems. The doctoral student describes, identifies and summarises fundamental concepts of concurrent multitasking programming and how they are applied when building tasks. The doctoral student describes, identifies and summarises concepts and methods relating to the real-time processing of process information. The doctoral student describes, identifies and summarises concepts and methods related to developing task systems for various categories of applications.						
Skills		The doctoral student applies appropriate techniques, principles of physics and mathematical methods to solve problems related to conventional multitasking design in real-time control engineering, with an emphasis on numerical methods. The doctoral student uses programming languages, environments and technologies, as well as specific tools (algorithms, diagrams, models, protocols, etc.), to solve problems related to the real-time control of processes. The doctoral student performs system-level modelling and develops real-time digital control systems, interfaces, and microcontroller- and microprocessor-based systems using integrated hardware-software design (co-design) and software engineering. The graduate specifies requirements, develops simulation scenarios and proposes solutions to real-time control problems.						
Responsibility and autonomy		The doctoral student student carries out real-time control project management processes, assumes different team roles, and describes the results clearly and concisely, both orally and in writing. The doctoral student student demonstrates initiative and takes action to update professional, economic and organisational-culture knowledge.						
3	Hierarchical and Distributed Automation Systems	375	170	205	5	Exam..	15	Prof. PhD, Eng Nicolae PARASCHIV., Sen. Lect. PhD, Eng. Marian POPESCU,
LEARNING OUTCOMES								
Knowledge		The doctoral student identifies and summarises fundamental concepts of real-time control and how they are applied to specific problems. The doctoral student describes, identifies and summarises fundamental concepts of concurrent multitasking programming and their application in task construction. The doctoral student describes, identifies and summarises concepts and methods related to the real-time processing of process information. The doctoral student describes, identifies and summarises concepts and methods used to develop task systems for various categories of applications.						
Skills		The doctoral student applies techniques, principles of physics and appropriate mathematical methods to solve problems related to standard multitasking design in real-time control engineering, with an emphasis on numerical methods. The doctoral student uses programming languages, environments and technologies, as well as specific tools (algorithms, diagrams, models, protocols, etc.), to solve problems related to the real-time control of processes.						

		The doctoral student models at system level and develops real-time digital control systems, interfaces, and microcontroller- and microprocessor-based systems using integrated hardware-software design (co-design) and software engineering. The doctoral student specifies requirements, develops simulation scenarios and proposes solutions to real-time control problems.						
	Responsibility and autonomy	The student carries out real-time control project management processes, assumes different team roles, and presents results clearly and concisely, both orally and in writing. The student demonstrates initiative and takes action to update professional, economic and organisational-culture knowledge.						
4	Artificial Intelligence Techniques	375	170	205	5	Exam..	15	Prof. PhD, Eng. Mihaela OPREA., Assoc. Prof. Elena Simona NICOARĂ.,
LEARNING OUTCOMES								
	Knowledge	1. The doctoral student describes, identifies and summarises fundamental concepts in automatic control systems, embedded and intelligent systems, computer science and information technology, and explains how they are applied to specific problems.						
	Skills	The doctoral student uses programming languages, environments and technologies, as well as specific tools (algorithms, diagrams, models, protocols, etc.), to solve well-defined systems engineering problems. The doctoral student performs system-level modelling and develops digital control systems, interfaces, and microcontroller- and microprocessor-based systems using integrated hardware-software design (co-design) and software engineering. The doctoral student evaluates and selects, adapts and extends computer-aided design (CAD) tools and dedicated hardware and software packages for implementing complex systems related to systems engineering.						
	Responsibility and autonomy	1. The doctoral student demonstrates initiative and takes action to update their professional and economic knowledge and their knowledge of organisational culture.						
5	Fuzzy-Hybrid Intelligent Systems	375	170	205	5	Exam..	15	Prof, Habil. PhD, Eng. Valentina Emilia BĂLAȘ Assoc. Prof., PhD, Eng. Elena Sanda Florentina MIHALACHE
LEARNING OUTCOMES								
	Knowledge	The doctoral student describes, identifies and summarises the fundamental concepts of automation, methods for process modelling, identification, simulation and analysis, computer-aided design techniques for classical and intelligent automatic systems, and their application to specific problems.						
	Skills	The doctoral student interprets and explains automation problems for various types of processes using fundamental principles of systems theory, automatic control engineering, modelling and simulation, computer-aided design techniques, and analysis methods specific to systems engineering. The doctorastudent recognises and implements complex architectures for intelligent autonomous systems. The doctorastudent specifies requirements, develops simulation scenarios, proposes solutions to control problems, and analyses and evaluates the performance of automatic systems.						

		The doctoral student configures and implements control systems for industrial processes, robots and flexible manufacturing lines, including through modern Internet of Things and Industry 4.0 approaches, selects the equipment, and commissions the corresponding structures.						
	Responsibility and autonomy	The doctoral student acts honourably, responsibly and ethically, in accordance with the law, in order to uphold the reputation of the profession.						
6	Dynamic Systems Modelling and Simulation	375	170	205	5	Exam..	15	Sen.Lect. PhD Eng Marian POPESCU, Assoc. Prof. PhD Eng Cristina Roxana POPA,.
LEARNING OUTCOMES								
	Knowledge	1. The doctoral student describes, identifies, and summarizes methods for process modeling, identification, simulation, and analysis, and explains how they are applied to specific dynamic modeling and simulation problems.						
	Skills	The doctoral student interprets and explains automation problems for various types of processes using the fundamental principles of modeling and simulation and analysis methods specific to systems engineering. The doctoral student specifies requirements, develops simulation scenarios, proposes solutions to control problems, and analyzes and evaluates the performance of automatic control systems.						
	Responsibility and autonomy	1. The doctoral studente acts honorably, responsibly, ethically, and in accordance with the law to uphold the reputation of the profession.						
7	Advanced Digital Signal Processing	375	170	205	5	Exam.	15	Prof. habil. PhD Eng.Gabriel RĂDULESCU, Sen. Lect. PhD Eng.Ştefan BALA,
LEARNING OUTCOMES								
	Knowledge	The doctoral student describes, identifies and summarises concepts and methods relating to systems in general, as well as to electrical and electronic engineering, and explains how they are applied to specific problems using appropriate mathematics and physics tools. The doctoral student describes, identifies and summarises fundamental concepts of automatic control, methods for process modelling, identification, simulation and analysis, and computer-aided design techniques for conventional and intelligent automatic systems, including their application to specific problems.						
	Skills	The doctoral student uses programming languages, environments and technologies, together with specialised tools (algorithms, diagrams, models, protocols, etc.), to solve well-defined systems engineering problems. The doctoral student models systems at system level and develops digital control systems, interfaces, and microcontroller- and microprocessor-based systems using integrated hardware–software design (co-design) and software engineering.						
	Responsibility and autonomy	The doctoral student carries out systems engineering project management processes, assumes different team roles, and communicates results clearly and concisely, both orally and in writing. The student demonstrates initiative and takes action to update their professional, economic and organisational-culture knowledge.						

8	Advanced Operations Research Techniques	375	170	205	5	Exam..	15	Prof. Habil. PhD Eng. Luminița DUȚĂ Associ. Prof. PhD Eng. Cristina Roxana POPA
LEARNING OUTCOMES								
Knowledge		1. The doctoral student describes, identifies and summarizes fundamental concepts in automatic systems, embedded and intelligent systems, computer science and information technology, as well as how they are applied to specific problems.						
Skills		The doctoral student uses programming languages, environments and technologies, as well as specific tools (algorithms, diagrams, models, protocols, etc.), to solve well-defined systems engineering problems.						
Responsibility and autonomy		1. The doctoral student demonstrates initiative and takes action to update their professional, economic and organizational culture knowledge.						
9	Discrete-Event Systems	375	170	205	5	Exam..	15	Prof. PhD Eng. Otilia CANGEA, Assoc. Prof. PhD Math. Florentina TOADER,
LEARNING OUTCOMES								
Knowledge		1. The doctoral student describes, identifies and summarises fundamental concepts in Systems Engineering; methods for modelling, simulating and analysing real systems as discrete event systems; and techniques for the design and software implementation of control structures based on Petri net formalism.						
Skills		The doctoral student interprets and explains problems specific to the dynamics of event-driven systems by applying fundamental principles of systems theory, modelling and simulation, computer-aided design techniques, and analytical methods specific to systems engineering. The doctoral student identifies, configures and implements complex architectures for the control of industrial processes modelled as discrete event systems, such as robots and flexible manufacturing lines, including through modern Internet of Things and Industry 4.0 approaches; selects the equipment; and commissions the associated structures.						
Responsibility and autonomy		The doctoral student acts honourably, responsibly and ethically, in accordance with the law, to uphold the reputation of the profession.						
10	Advanced Systems Theory	375	170	205	5	Exam..	15	Assoc. Prof. PhD Eng Alina Simona BĂIEȘU, Assoc. Prof. PhD Eng. Sanda Florentina MIHALACHE,
LEARNING OUTCOMES								
Knowledge		The doctoral student describes, identifies and summarises fundamental concepts of systems theory, methods for analysing processes and automatic control systems, and their application to specific problems.						

	Skills	The doctoral student interprets and explains automation problems for various types of processes by applying the basic principles of systems theory, modelling and simulation, and analysis methods specific to systems engineering. The doctoral student specifies requirements, proposes solutions to control problems, and analyses and evaluates the performance of automatic control systems.						
	Responsibility and autonomy	The doctoral student acts with integrity, responsibility and professional ethics, in accordance with the law, thereby safeguarding the reputation of the profession.						
11	Advanced Control Algorithms	375	170	205	5	Exam..	15	Assoc. Prof. PhD, Eng.. Sanda Florentina MIHALACHE, Assoc. Prof. PhD, Eng. Alina Simona BĂIEȘU,
LEARNING OUTCOMES								
	Knowledge	1. The doctoral student identifies and summarises fundamental concepts in automatic systems, embedded and intelligent systems, computer science and information technology, and explains how they are applied to specific problems. 2. The doctoral student describes, identifies and summarises fundamental concepts of automation, methods for process modelling, identification, simulation and analysis, and computer-aided design techniques for classical and intelligent automatic systems, as well as their application to specific problems.						
	Skills	The doctoral student recognises and implements complex architectures for intelligent autonomous systems. The doctoral student specifies requirements, develops simulation scenarios, proposes solutions to control problems, and analyses and evaluates the performance of automatic systems. The doctoral student configures and implements industrial process control systems, including through modern Internet of Things and Industry 4.0 approaches, selects the equipment and commissions the associated structures.						
	Responsibility and autonomy	The doctoral student carries out systems engineering project management processes, assumes various team roles, and describes the results clearly and concisely, both orally and in writing. 2. The doctoral student demonstrates initiative and takes action to update their professional, economic and organisational-culture knowledge.						
	Complementary Courses							
12	Project Management	300	136	164	4	Exam..	12	Prof. habil. Dr. Eng. Ion NAE Prof. habil. Dr. Eng. Marius Gabriel PETRESCU
LEARNING OUTCOMES								
	Knowledge	The doctoral student describes, identifies and summarises fundamental project management concepts and how they are applied to specific problems in systems engineering. The doctoral student explains and interprets technical, economic and managerial documentation for the development of projects and processes specific to the field.						

	Skills	1. The doctoral student selects and applies relevant scientific methods and techniques when developing and implementing systems engineering projects, and analyses the level of scientific substantiation as well as the potential advantages and disadvantages of the proposed methods and procedures. 2. The doctoral student models and simulates concepts and processes when solving specific tasks using computer-assisted methods. 3. The doctoral student interprets and explains issues relating to project planning, coordination and implementation using specialised project management software.						
	Responsibility and autonomy	1. The doctoral student carries out project management processes in systems engineering, assumes different team roles, and describes the results clearly and concisely, both orally and in writing. 2. The doctoral student develops working and communication skills for effective collaboration in completing tasks specific to systems engineering. 3. The doctoral student demonstrates awareness of social responsibility and professional ethics.						
13	Statistical Data Processing	300	136	164	4	Exam..	12	Assoc. Prof. PhD Eng.Cristina Roxana POPA, Sen. Lect. PhD Eng. Marian POPESCU,
LEARNING OUTCOMES								
	Knowledge	1. The doctoral student describes, identifies, and summarises fundamental concepts in automatic systems, embedded and intelligent systems, computer science, and information technology, as well as how they are applied to specific problems.						
	Skills	The doctoral student uses programming languages, environments, technologies, and specific tools (algorithms, diagrams, models, protocols, etc.) to solve well-defined systems engineering problems. The doctoral student evaluates and selects, adapts, and extends computer-aided design (CAD) tools and dedicated hardware and software packages to implement complex systems related to systems engineering. The doctoral student performs system-level modelling and develops digital control systems, interfaces, and microcontroller- and microprocessor-based systems using integrated hardware-software design (co-design) and software engineering.						
	Responsibility and autonomy	1. The doctoral student demonstrates initiative and takes action to update professional, economic, and organisational culture knowledge.						
14	Data Acquisition, Transfer and Storage Techniques	300	136	164	4	Exam..	12	Prof. PhD Eng. Nicolae PARASCHIV, Sen. Lect. PhD Eng. Florin Ștefan ZAMFIR,
LEARNING OUTCOMES								
	Knowledge	1. The doctoral student describes, identifies and summarises fundamental concepts related to data acquisition, transfer and storage. 2. The doctoral student identifies and summarises fundamental concepts in automatic systems, embedded and intelligent systems, computer science and information technology, as well as their application to specific data acquisition, transfer and storage problems.						

	Skills	The student explains the assigned problems, substantiates solutions in measurement systems engineering based on mathematical principles and the laws of physics, and uses basic components in the field and techniques for measuring electrical and non-electrical quantities. The student applies appropriate techniques, principles of physics and mathematical methods to solve common problems in data acquisition, transfer and storage systems engineering, with an emphasis on numerical methods. The student recognises and implements complex architectures for data acquisition, transfer and storage systems.						
	Responsibility and autonomy	1. The doctoral student carries out project management processes in data acquisition, transfer and storage systems engineering, assumes different team roles, and communicates results clearly and concisely, both orally and in writing. 2. The doctoral student demonstrates initiative and takes action to update professional, economic and organisational culture knowledge.						
15	Knowledge Engineering	300	136	164	4	Exam..	12	Prof. PhD Eng. Mihaela OPREA, Assoc. Prof. PhD Math. Elena Simona NICOARĂ,
LEARNING OUTCOMES								
	Knowledge	1. The doctoral student describes, identifies, and summarises fundamental concepts in automatic systems, embedded and intelligent systems, computer science, and information technology, as well as how they are applied to specific problems.						
	Skills	The doctoral student uses programming languages, environments, and technologies, as well as specific tools (algorithms, diagrams, models, protocols, etc.), to solve well-defined systems engineering problems. The doctoral student models at system level and develops digital control systems, interfaces, and microcontroller- and microprocessor-based systems using integrated hardware-software design (co-design) and software engineering. The doctoral student evaluates and selects, adapts, and extends computer-aided design (CAD) tools and dedicated hardware and software packages for implementing complex systems related to systems engineering.						
	Responsibility and autonomy	1. The doctoral student demonstrates initiative and takes action to update their professional, economic, and organisational culture knowledge.						
16	Soft Computing	300	136	164	4	Exam..	12	Prof.univ.habil.PhD.eng. Valentina Emilia BĂLAȘ Prof.univ.habil.PhD.Eng. Gabriel RĂDULESCU
LEARNING OUTCOMES								
	Knowledge	The doctoral student describes, identifies and summarises fundamental concepts of automation, methods for process modelling, identification, simulation and analysis, computer-aided design techniques for classical and intelligent automatic systems, and their application to specific problems.						
	Skills	The doctoral student interprets and explains automation problems for various types of processes using the fundamental principles of systems theory, automatic control engineering, modelling and simulation, computer-aided design techniques, and analysis methods specific to systems engineering. The doctoral student recognises and implements complex architectures for intelligent autonomous systems.						

<table border="1"> <tr> <td colspan="2"></td><td colspan="7"> The doctoral student/graduate specifies requirements, develops simulation scenarios, proposes solutions to control problems, and analyses and evaluates the performance of automatic systems. The doctoral student configures and implements control systems for industrial processes, robots and flexible manufacturing lines, including through modern Internet of Things and Industry 4.0 approaches; selects equipment and commissions the associated structures. </td></tr> <tr> <td colspan="2">Responsibility and autonomy</td><td colspan="7">The doctoral student acts honourably, responsibly, ethically and in accordance with the law, thereby safeguarding the reputation of the profession.</td></tr> </table>											The doctoral student/graduate specifies requirements, develops simulation scenarios, proposes solutions to control problems, and analyses and evaluates the performance of automatic systems. The doctoral student configures and implements control systems for industrial processes, robots and flexible manufacturing lines, including through modern Internet of Things and Industry 4.0 approaches; selects equipment and commissions the associated structures.							Responsibility and autonomy		The doctoral student acts honourably, responsibly, ethically and in accordance with the law, thereby safeguarding the reputation of the profession.						
		The doctoral student/graduate specifies requirements, develops simulation scenarios, proposes solutions to control problems, and analyses and evaluates the performance of automatic systems. The doctoral student configures and implements control systems for industrial processes, robots and flexible manufacturing lines, including through modern Internet of Things and Industry 4.0 approaches; selects equipment and commissions the associated structures.																								
Responsibility and autonomy		The doctoral student acts honourably, responsibly, ethically and in accordance with the law, thereby safeguarding the reputation of the profession.																								
17	Research Methodology	300	136	164	4	Exam..	12	Prof., Habil., PhD Eng. Luminița DUȚĂ Prof. PhD Eng. Nicolae PARASCHIV																		
LEARNING OUTCOMES																										
Knowledge		1. The doctoral student describes, identifies and summarises concepts and methods relating to systems in general, as well as measurement techniques, graphics, mechanical, chemical, electrical and electronic engineering, and their application to specific problems using relevant mathematical and physical tools.																								
Skills		The doctoral student selects and applies specific scientific methods and techniques when developing and implementing projects in systems engineering and analyses the level of scientific documentation and the potential advantages and disadvantages of the proposed methods and procedures.																								
Responsibility and autonomy		The doctoral student demonstrates a high level of authority, innovation, autonomy, scientific and professional integrity, and sustained commitment to developing new ideas or processes at the forefront of a work or study context, including research.																								
18	Digital Audio Processing	300	136	164	4	Exam..	12	Prof. habil. PhD Eng. Gabriel RĂDULESCU Sen. Lect. PhD Eng. Cosmina ROȘCA																		
LEARNING OUTCOMES																										
Knowledge		The doctoral student describes, identifies and summarizes concepts and methods relating to systems in general, as well as to electrical and electronic engineering, and explains how they are applied to specific problems using relevant mathematical and physics tools. The student/graduate describes, identifies and summarizes fundamental automation concepts, methods for process modelling, identification, simulation and analysis, and computer-aided design techniques for classical and intelligent automatic systems, as well as their application to specific problems.																								
Skills		The doctoral student uses programming languages, environments and technologies, as well as specific tools (algorithms, diagrams, models, protocols, etc.), to solve well-defined systems engineering problems. The doctoral student performs system-level modelling and develops digital control systems, interfaces, and microcontroller- and microprocessor-based systems using integrated hardware-software design (co-design) and software engineering.																								
Responsibility and autonomy		The doctoral student carries out systems engineering project management processes, assumes different team roles, and communicates the results clearly and concisely, both orally and in writing.																								

	The doctoral student demonstrates initiative and takes action to update their professional, economic and organizational culture knowledge.
--	--

Note. One course shall be selected from each category.

Prepared by the Coordinator of the Systems Engineering Doctoral Field,
Prof. Dr. Eng. Nicolae PARASCHIV

Endorsed by the Director of the Doctoral School
Prof. Habil. Dr. Eng. Timur Vasile CHIŞ