

PLAN DE ÎNVĂȚĂMÂNT
Pentru seria de studenți 2025-2027

Programul de studii univ. de masterat:	Automotive Electronic Systems
Tipul de masterat:	de cercetare
Domeniul fundamental (DFI):	Științe Inginerești
Ramura de știința (RSI):	Inginerie electrică, electronică și telecomunicații
Domeniul de licență (DL):	Electronică, Telecomunicații și Tehnologii Informaționale
Durata studiilor / Numărul de credite:	2 ani / 120 credite
Forma de învățământ:	IF - Învățământ cu frecvență
Domeniul de studii universitare de masterat (DSU_M):	Inginerie electronică, Telecomunicații și Tehnologii Informaționale

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Misiunea programului de studii:

The mission of the AES program, both as a teaching and research mission, falls within the mission of the field of Electronic Engineering, Telecommunications, and Information Technology, directly complementing the skills associated with engineers licensed in this field (MP1) with skills and competencies in the automotive field.

Obiectivele programului de studii:

Developing research skills for graduates of the bachelor's degree program in automotive electronics (OP3).

Competențele programului de studii:

Competențe profesionale:

- 1.Approves engineering projects
- 2.Conducts scientific research
- 3. Electronic systems designs
- 4.Prepare technical reports
- 5.Uses dedicated software for data analysis
- 6. Control systems designs
- 7.Tests sensors
- 8.Operates remote-control equipment
- 9.Synthesizes information
- 10.Presents analysis results
- 11.Engages professionally in research and professional environments
- 12.Designs power electronics systems
- 13.Tests power electronics systems
- 14.Models power electronics systems
- 15.Sensors designs
- 16.Prepare prototypes for production
- 17.Tests sensors

Competențe transversale:

- 1. Think innovatively
- 2. Operate digital hardware equipment
- 3. Use communication and collaboration software
- 4. Apply scientific, technological, and engineering knowledge
- 5. Work in teams

Rezultatele învățării specifice programului de studii:

Cunoștințe	Aptitudini	Responsabilitate și autonomie
electronic systems, including the analysis of components and their interactions.	using simulation tools and mathematical methods for optimization.	cross-functional contexts, coordinating testing processes and proposing solutions to identified deficiencies.
C15. The student/graduate is familiar with testing procedures and standards applicable to power electronic systems, as well as engineering solutions for performance optimization.	A23. The student/graduate designs sensors, selecting appropriate materials and technologies for specific applications.	RA17. The student/graduate assumes responsibility for the quality and functionality of designed and tested sensors.
C16. The student/graduate demonstrates advanced knowledge of the operating principles, typologies, and applications of sensors.	A24. The student/graduate prepares prototypes for production, developing experimental models and associated technical documentation.	RA18. The student/graduate demonstrates autonomy in planning and monitoring prototyping and production processes.
C17. The student/graduate explains methods and techniques for designing sensors and integrated sensor systems within complex products.	A25. The student/graduate tests sensors, applying verification and performance validation procedures.	RA19. The student/graduate collaborates within multidisciplinary teams, ensuring sensor integration into products while respecting technical and ethical standards.
C18. The student/graduate is familiar with procedures and standards for testing, prototyping, and monitoring the production of sensors and sensor-based equipment.		

Rezultatele complementare ale învățării:		
Cunoștințe	Aptitudini	Responsabilitate și autonomie
C1. The student/graduate describes concepts of ethics, academic integrity, and regulations regarding research. C2. The student/graduate identifies connections between electronic engineering and other fields (management, social sciences, software engineering). C3. The student/graduate explains advanced principles and methodologies for integrating hardware and software technologies into complex engineering systems.	A1. The student/graduate communicates results professionally, in the form of reports and scientific papers. A2. The student/graduate proposes and implements innovative solutions to technical problems in interdisciplinary contexts. A3. The student/graduate uses hardware and software communication tools and collaborates to solve complex and multidisciplinary tasks.	RA1. The student/graduate assumes responsibility for adhering to ethical standards and professional integrity. RA2. The student/graduate participates in the dissemination of knowledge through research activities and scientific communication. RA3. The student/graduate works effectively in multidisciplinary teams, promoting collaboration and shared responsibility in achieving objectives.

Finalități:	
Absolvenții programului de studii universitare de masterat vor accesa următoarele ocupații posibile conform Clasificării Ocupațiilor din România ISCO-08:	
2152.1 – Electronics Engineer 2152.1.3 – Industrial Monitoring Equipment Engineer 2152.1.10 – Microsystems Engineer 2152.1.12 – Power Electronics Engineer 2152.1.15 – Sensor Design Engineer	

Domeniul de licență: Electronică, Telecomunicații și Tehnologii Informaționale
Programul de studii univ. de masterat de cercetare: Automotive Electronic Systems

Forma de învățământ: IF - Învățământ cu frecvență
Durata studiilor: 2 ani

Domeniul fundamental (DFI): Științe Inginerești
Ramura de știință (RSI): Inginerie electrică, electronică și telecomunicații
Domeniul de studii universitare de masterat (DSU_M): Inginerie electronică, Telecomunicații și Tehnologii Informaționale

Cod DFI	Cod RSI	Cod DSU_M
20	20	10

ciclu	c1c2c3	a1a2
M	239	25

PLAN DE ÎNVĂȚĂMÂNT
Pentru seria de studenți 2025-2027
ANUL I (2025-2026)

SEMESTRUL 1											SEMESTRUL 2										
1	Opțional 1 / Deep Neural Networks / Car to Car Communication/ Design and Research Methodology										Opțional 2 / Quality Management in the Automotive Industry/ Machine Learning / Architectures for Intelligent Data Processing										
	M239.25.01.F1-ij	5	V	28	0	28	0	0	DF	69	M239.25.02.F1-ij	6	E	28	0	14	0	0	DF	108	
2	High Performance Computing, Memories and Smart Sensors										Automotive Systems Modelling and Design										
	M239.25.01.F2	5	E	28	0	0	28	0	DF	69	M239.25.02.S2	5	V	28	0	28	0	0	DS	69	
3	Reliability and Functional Safety Elements of Automotive Electronic Systems										Thermal Design and Techniques to Minimize Disruptive Effects										
	M239.25.01.S3	5	E	28	0	14	14	0	DS	69	M239.25.02.S3	6	E	28	0	28	14	0	DS	80	
4	Advances in Power Electronics Design										Automotive Communication Protocols										
	M239.25.01.S4	5	E	28	0	0	28	0	DS	69	M239.25.02.F4	5	E	28	0	28	0	0	DF	69	
5	Academic Ethics and Integrity										Practica de Cercetare 2 (Research Practice 2)										
	M239.25.01.C5	2	V	14	7	0	0	0	DC	29	M239.25.02.S5	8	V	0	0	0	0	140	DS	60	
6	Practica de Cercetare 1 (Research Practice 1)																				
	M239.25.01.S6	8	V	0	0	0	0	140	DS	60											
7																					
8																					
9																					
10																					
total / sem.	VAi:	245			VPI:			365			VAi:	224			VPI:			386			
	VA (VAi+VAp):	385			VCA (VA+VPI):			750			VA (VAi+VAp):	364			VCA (VA+VPI):			750			
	credite:	30			evaluări:			3E,3V,0C			credite:	30			evaluări:			3E,2V,0C			
total / săptăm.	VAi:	17.5			VPI:			26.1			VAi:	16.0			VPI:			27.6			
	VA (VAi+VAp):	27.5			VCA (VA+VPI):			53.6			VA (VAi+VAp):	26.0			VCA (VA+VPI):			53.6			
	din care:				9.0	0.5	3.0	5.0	10.0	(c, s, l, p, VAp)	din care:				8.0	0.0	7.0	1.0	10.0	(c, s, l, p, VAp)	

Observatii:

Pentru seria de studenti 2025-2027

ANUL II (2026-2027)

	SEMESTRUL 3										SEMESTRUL 4									
1	Opțional 3 Low Power Electronic Systems / Modern Programming Techniques										Practica de Cercetare 4 (Research Practice 4)									
	M239.25.03.F1-ij	5	V	28	0	28	0	0	DF	69	M239.25.04.S1	15	V	0	0	0	0	196	DS	179
2	Opțional 4 Elements of Artificial Intelligence / Optimization of Electronic Products for Series Production										Elaborarea lucrării de disertație Dissertation Thesis Preparation									
	M239.25.03.S2-ij	6	E	28	0	28	0	0	DS	94	M239.25.04.S2	15	C	0	0	0	196	0	DS	179
3	Digital Control of Electronic Power Converters										Examen de disertație Dissertation Exam									
	M239.25.03.F3	6	E	28	0	14	28	0	DF	80	M239.25.04.S3	10	E	0	0	0	0	0	DS	250
4	Testing Techniques in the Development of Automotive Products																			
	M239.25.03.F4	5	E	28	0	28	0	0	DF	69										
5	Practica de Cercetare 3 (Research Practice 3)																			
	M239.25.03.S5	8	V	0	0	0	0	140	DS	60										
6																				
7																				
8																				
9																				
10																				
total / sem.	VAi:	238			VPI:	372					VAi:	196			VPI:	608				
	VA (VAi+VAp):	378			VCA (VA+VPI):	750					VA (VAi+VAp):	392			VCA (VA+VPI):	1000				
	credite:	30			evaluări:	3E,2V,0C					credite:	30+10*			evaluări:	1E,1V,1C				
total / săpt.	VAi:	17.0			VPI:	26.6					VAi:	14.0			VPI:	43.4				
	VA (VAi+VAp):	27.0			VCA (VA+VPI):	53.6					VA (VAi+VAp):	28.0			VCA (VA+VPI):	71.4				
	din care:				8.0	0.0	7.0	2.0	10.0	(c, s, l, p, VAp)	din care:				0.0	0.0	0.0	14.0	14.0	(c, s, l, p, VAp)

* Credite suplimentare alocate Examenului de disertație

Observatii:

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DISCIPLINE OPTIONALE
Pentru seria de studenti 2025-2027

ANUL I (2025-2026)																				
	SEMESTRUL 1										SEMESTRUL 2									
01	Opțional 1 Deep Neural Networks										Opțional 2 Quality Management in the Automotive Industry									
	M239.25.01.F1-01	5	V	28	0	28	0	0	DF	69	M239.25.02.F1-01	6	E	28	0	14	0	0	DF	108
02	Opțional 1 Car to Car Communication										Opțional 2 Machine Learning									
	M239.25.01.F1-02	5	V	28	0	28	0	0	DF	69	M239.25.02.F1-02	6	E	28	0	14	0	0	DF	108
03	Opțional 1 Design and Research Methodology										Opțional 2 Architectures for Intelligent Data Processing									
	M239.25.01.F1-03	5	V	28	0	28	0	0	DF	69	M239.25.02.F1-03	6	E	28	0	14	0	0	DF	108
04																				
05																				
06																				
07																				
08																				
09																				
10																				

Observatii: (*)

DISCIPLINE OPTIONALE
Pentru seria de studenti 2025-2027

ANUL II (2026-2027)

	SEMESTRUL 3										SEMESTRUL 4									
01	Opțional 3 Low Power Electronic Systems																			
	M239.25.03.F1-01	5	V	28	0	28	0	0	0	DF	69									
02	Opțional 3 Modern Programming Techniques																			
	M239.25.03.F1-02	5	V	28	0	28	0	0	0	DF	69									
03	Opțional 4 Elements of Artificial Intelligence																			
	M239.25.03.S2-03	6	E	28	0	28	0	0	0	DS	94									
04	Opțional 4 Optimization of Electronic Products for Series Production																			
	M239.25.03.S2-04	6	E	28	0	28	0	0	0	DS	94									
05																				
06																				
07																				
08																				
09																				
10																				

Observatii: (*)

Legenda

Nume disciplina										
Cod	nc	FE	c	s	l	p	VAp	CF	VPI	

Cod = cod disciplina
nc = nr.credite transferabile
FE = forma de evaluare
FE ∈ {E, V, C}
E=examen
V=verificare
C=colocviu
c=nr.ore curs/semestru
s=nr.ore seminar
l=nr.ore laborator
p=nr.ore proiect
VAp- volum de ore necesar activitatilor partial asistate

Exemplu										
Tehnologii avansate de măsurare										
M170.17.01.V1	8	E	28	0	28	0	49	DC	50	

CF=categorie formativa careia ii apartine disciplina
CF={DF, DS, DC}
DF - disciplina fundamentala
DS - disciplina de specializare
DC - disciplina complementara
VPI = volum de ore necesar pregatirii individuale pentru un semestru de 14 sapt. plus 4 sapt. de sesiune
VAi- volum de ore necesar activitatilor integral asistate=c+s+l+p
VA - volum de ore necesar activitatilor integral asistate si al celor asistate partial
=VAi+Vap
VCA - volum de ore cumulat al tuturor activitatilor = VA+VPI

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DISCIPLINE FACULTATIVE
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ANUL I (2025-2026)

	SEMESTRUL 1										SEMESTRUL 2									
01											Voluntariat									
											M239.25.02.F10-01	2	C	0	0	0	28	0	F	22
02																				
03																				
04																				

Observatii:

DISCIPLINE FACULTATIVE
Pentru seria de studenti 2025-2027
ANUL II (2026-2027)

	SEMESTRUL 3										SEMESTRUL 4									
01											Voluntariat									
											M239.25.04.F10-01	2	C	0	0	0	28	0	F	22
02																				
03																				
04																				

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