

## PLAN DE ÎNVĂȚĂMÂNT

**Programul de studii univ. de master:**

**MACHINE LEARNING / ÎNVĂȚARE AUTOMATĂ**

**Tipul de masterat:**

**de cercetare**

**Domeniul fundamental (DFI):**

**Engineering Science/ Științe Inginerești**

**Ramura de știință (RSI):**

System Engineering, Computer and Information Technology/ Ingineria sistemelor, calculatoare și tehnologia informației

**Domeniul de licență (DL):**

**Computer and Information Technology**

**Durata studiilor / Numărul de credite:**

**2 ani / 120 credite**

**Forma de învățământ:**

**IF - Invatamant cu frecventa**

**Domeniul de studii universitare de master (DSU\_M):**

**Computer and Information Technology**

**RECTOR,**  
Conf.univ.dr.ing. Florin DRĂGAN

**DECAN,**  
Prof.univ.dr.habil.ing. Marius-George MARCU

#### **Misiunea programului de studii:**

The Master of Machine Learning program produces highly qualified specialists in the field of machine learning, able to develop efficient and high-performance artificial intelligence systems and to actively contribute to the evolution of the industry in this field. The main components on which the master's program focuses are: machine learning, deep learning, computer vision, and big data, which are becoming increasingly important in the development of current software systems, especially those with artificial intelligence.

#### **Obiectivele programului de studii:**

- Opportunity to gain a specialization of very high demand at national and international level;
- Learn new concepts in one of the most dynamic fields of computer science;
- Machine learning jobs are among the highest paid and have the highest job satisfaction;
- First step in a possible research career.

#### **Competențele programului de studii:**

##### **Competențe profesionale:**

- Advanced knowledge of the main topics and problems in the field of machine learning;
- Knowledge of the current technologies and abilities to select and apply them in the development of machine learning projects;
- Skills to critically analyze, innovate, and research;
- Advanced abilities of communication, interdisciplinary cooperation, and team project management.

##### **Competențe transversale:**

- Behaving honorably, responsibly and ethical, according to the law, to ensure problem solving;
- Identifying, describing and executing the processes of project management, by fulfilling various roles within the team, and describing the results in the field of activity, in a clear and concise manner, verbal and in writing, using the Romanian language and an international language;
- Proving action and initiative spirit to get current with the knowledge at professional, economic and management levels.

#### **Finalități:**

Absolvenții programului de studii universitare de master vor accesa următoarele ocupații posibile conform Clasificării Ocupațiilor din România ISCO-08:

- 215235 - Cercetător în calculatoare
- 215236 - Inginer de cercetare în calculatoare
- 251101 - Proiectant sisteme informatice

Domeniul de licență:  
Programul de studii univ. de master de cercetare:

Computer and Information Technology  
MACHINE LEARNING / ÎNVĂȚARE AUTOMATĂ

Forma de învățământ:  
Durata studiilor:

IF - Învățământ cu frecvență  
2 ani

Domeniul fundamental (DFI):  
Ramura de știință (RSI):  
Domeniul de studii universitare de master (DSU\_M):

Engineering Science/ Științe Inginerești  
System Engineering, Computer and Information Technology/ Ingineria sistemelor, calculatoare și tehnologia informației  
Computer and Information Technology

Cod DFI	Cod RSI	Cod DSU_M
20	60	10

ciclul	c1c2c3	a1a2
M	3	23

**PLAN DE ÎNVĂȚĂMÂNT**  
Pentru seria de studenți 2023-2025  
ANUL I (2023-2024)

	SEMESTRUL 1											SEMESTRUL 2										
1	Optional Core 1 (choose one from positions 1-5)											Optional Core 3 (choose one from positions 1-5)										
	M3.23.01.V1-ij	7	E	28	0	28	0	0	0	DCAV	119	M3.23.02.A1-ij	7	E	28	0	28	0	0	0	DA	119
2	Optional Core 2 (choose one from positions 1-5)											Optional Core 4 (choose one from positions 1-5)										
	M3.23.01.V2-ij	7	E	28	0	28	0	0	0	DCAV	119	M3.23.02.A2-ij	7	E	28	0	28	0	0	0	DA	119
3	Elective 1 (choose one from Master ML/ IT/ CI/ SE)											Elective 2 (choose one from Master ML/ IT/ CI/ SE)										
	M3.23.01.V3	7	E	28	0	28	0	0	0	DCAV	119	M3.23.02.A3	7	E	28	0	28	0	0	0	DA	119
4	Research Topics in ML											Introduction to Research										
	M3.23.01.V4	9	D	28	0	0	0	0	168	DCAV	29	M3.23.02.V4	7	D	28	0	0	0	0	140	DCAV	7
5												Academic Ethics and Integrity										
												M3.23.02.C5	2	D	14	7	0	0	0	0	DC	29
6																						
7																						
8																						
9																						
10												disciplina facultativa										
												M3.23.02.10-ij	2	C	28	0	0	0	0	0		22
total / sem.	VAi:	196			VPI:	386						VAi:	217			VPI:	393					
	VA (VAi+VAp):	364			VCA (VA+VPI):	750						VA (VAi+VAp):	357			VCA (VA+VPI):	750					
	credite:	30			evaluări:	3E,1D,0C						credite:	30			evaluări:	3E,2D,0C					
total / săpt.	VAi:	14,0			VPI:	27,6						VAi:	15,5			VPI:	28,1					
	VA (VAi+VAp):	26,0			VCA (VA+VPI):	53,6						VA (VAi+VAp):	25,5			VCA (VA+VPI):	53,6					
	din care:					8,0	0,0	6,0	0,0	12,0	(c, s, l, p, VAp)	din care:					9,0	0,5	6,0	0,0	10,0	(c, s, l, p, VAp)

Observatii:

Pentru seria de studenti 2023-2025

ANUL II (2024-2025)

SEMESTRUL 3											SEMESTRUL 4										
1	Optional Core 5 (choose one from positions 1-5)										Research Activity and Internship										
	M3.23.03.V1-ij	7	E	28	0	28	0	0	DCAV	119	M3.23.04.S1	15	C	0	0	0	0	168	DS	207	
2	Optional Core 6 (choose one from positions 1-5)										Master Thesis Development										
	M3.23.03.V2-ij	7	E	28	0	28	0	0	DCAV	119	M3.23.04.S2	15	C	0	0	0	0	196	DS	179	
3	Elective 3 (choose one from Master ML/ IT/ CI/ SE)										Examen de disertație/ Master Thesis Defense										
	M3.23.03.V3	7	E	28	0	28	0	0	DCAV	119	M3.23.04.S3	10	E	0	0	0	0		DS		
4	Directed Thesis Research																				
	M3.23.03.S4	9	D	0	0	0	28	168	DS	29											
5																					
6																					
7																					
8																					
9																					
10											disciplina facultativa										
											M3.23.04.10-ij	2	C	28	0	0	0	0		22	
total / sem.	VAi:	196			VPI:	386					VAi:	0			VPI:	386					
	VA (VAi+VAp):	364			VCA (VA+VPI):	750					VA (VAi+VAp):	364			VCA (VA+VPI):	750					
	credite:	30			evaluări:	3E,1D,0C					credite:	30+10*			evaluări:	1E,0D,2C					
total / săpt.	VAi:	14,0			VPI:	27,6					VAi:	0,0			VPI:	27,6					
	VA (VAi+VAp):	26,0			VCA (VA+VPI):	53,6					VA (VAi+VAp):	26,0			VCA (VA+VPI):	53,6					
	din care:					6,0	0,0	6,0	2,0	12,0	(c, s, l, p, VAp)	din care:					0,0	0,0	0,0	0,0	26,0

\* Credite suplimentare alocate Examenului de disertație

Observatii:

RECTOR,

Conf.univ.dr.ing. Florin DRĂGAN

DECAN,

Prof.univ.dr.habil.ing. Marius-George MARCU

**DISCIPLINE OPTIONALE**  
**Pentru seria de studenti 2023-2025**

**ANUL I (2023-2024)**

	SEMESTRUL 1										SEMESTRUL 2									
01	Optional Core 1-2 Fundamentals of Machine Learning										Optional Core 3-4 Natural Language Processing									
	M3.23.01.V1-01	7	E	28	0	28	0	0	DCAV	119	M3.23.02.A1-01	7	E	28	0	28	0	0	DA	119
02	Optional Core 1-2 Optimization in Machine Learning										Optional Core 3-4 Probabilistic Graphical Models									
	M3.23.01.V1-02	7	E	28	0	28	0	0	DCAV	119	M3.23.02.A1-02	7	E	28	0	28	0	0	DA	119
03	Optional Core 1-2 Deep Learning										Optional Core 3-4 Reinforcement Learning									
	M3.23.01.V1-03	7	E	28	0	28	0	0	DCAV	119	M3.23.02.A1-03	7	E	28	0	28	0	0	DA	119
04	Optional Core 1-2 Fundamentals of Computer Vision										Optional Core 3-4 Computer Vision									
	M3.23.01.V1-04	7	E	28	0	28	0	0	DCAV	119	M3.23.02.A1-04	7	E	28	0	28	0	0	DA	119
05	Optional Core 1-2 Big Data Analytics										Optional Core 3-4 Big Data Visualization									
	M3.23.01.V1-05	7	E	28	0	28	0	0	DCAV	119	M3.23.02.A1-05	7	E	28	0	28	0	0	DA	119
06																				
07																				
08																				
09																				
10																				





**DISCIPLINE FACULTATIVE**  
**Pentru seria de studenti 2023-2025**  
**ANUL I (2023-2024)**

	SEMESTRUL 1										SEMESTRUL 2										
01											Volunteering										
											M3.23.02.10-01	2	C	28	0	0	0	0	0	0	22
02																					
03																					
04																					

Observatii:

**DISCIPLINE FACULTATIVE**  
**Pentru seria de studenti 2023-2025**  
**ANUL II (2024-2025)**

	SEMESTRUL 3										SEMESTRUL 4									
01											Volunteering									
											M3.23.04.10-01	2	C	28	0	0	0	0	0	22
02																				
03																				
04																				

Observatii:

**RECTOR,**  
 Conf.univ.dr.ing. Florin DRĂGAN

**DECAN,**  
 Prof.univ.dr.habil.ing. Marius-George MARCU