

UNIVERSITY OF BUCHAREST

FACULTY OF PHYSICS

FIELD OF STUDY: PHYSICS

MASTER PROGRAM: PHYSICS OF ATOM, NUCLEUS, ELEMENTARY PARTICLES, ASTROPHYSICS, AND APPLICATIONS

DURATION OF STUDY: 2 YEARS (120 ECTS)

TYPE OF STUDY: FULL TIME

1-st YEAR SYLLABUS (2025-2026)

Nr. crt.	Cod	Discipline obligatorii	Tipul disciplinei	SEMESTRUL I						SEMESTRUL II					
				Tip			Forma de verificare	Număr de credite	Tip predare	Tip			Forma de verificare	Număr de credite	Tip predare
				c.t.	I.p.	sem.				c.t.	I.p.	sem.			
1	DI.101	Statistical Quantum Physics	knowledge-deepening	1		1	exam	6	Face to face						
2	DI.102	Interactions of the ionizing particles with matter	knowledge-deepening	2	2		exam	6	Face to face						
3	DI.103	Groups theory and applications in Physics	knowledge-deepening	1		1	exam	6	Face to face						
4	DI.104	Ethics and academic integrity	knowledge-deepening	1			colloquium	3	Face to face						
5	DI.105	Research activity practice	advanced knowledge		2		project assessment	3	Face to face						
6	DI.108	Radiation sources, dosimetry, and radiological protection	advanced knowledge							2	1		exam	7	Face to face
7	DI.109	Medical and Nuclear Electronics	advanced knowledge							2	2		exam	7	Face to face
8															
				5	4	2				4	3	0			
		Total ore discipline obligatorii / săptămână:		11				24		7				15	
		Discipline opționale													
1	DO.106.1/2	Radionuclides, environmental radioactivity, and nuclear waste management / Applications of Nuclear Physics in life sciences and medicine	advanced knowledge	2	2		exam	6	Face to face						
2	DO.110.1/2	Models for nuclear structure, nuclear and photonuclear reactions / Experimental physics of heavy-ions at low energies	knowledge-deepening							2	2		exam	8	Face to face
3	DO.111.1/2	Detection methods in Physics of atom, nucleus, elementary particles, and Astrophysics / Large experiments in Nuclear Physics, Particle Physics and Astrophysics	advanced knowledge							2	2		exam	8	Face to face
				2	2	0		6		4	4	0		0	
		Total ore discipline opționale / săptămână:		4				6		8				0	
		Total ore / săptămână		15				30		15				15	
		Total ore / an:	420												

		Total ore de curs: (din care 0% online)	210
		Total ore activități practice: (din care 0% online)	210

		Activități didactice cu credite peste cele prevăzute de legislație													

		Discipline facultative													
1	DFC.112	Simulation codes in Nuclear Physics	knowledge-deepening							2		2	exam	4	Face to face
2	DFC.113	Nuclear archaeology	knowledge-deepening							2		2	exam	4	Face to face
3	DFC.107/114	Volunteering	complementară				verificare	1					verificare	1	

RECTOR,
Prof. dr. Marian Preda

DECAN,
Prof. dr. Lucian Ion

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TYPE OF STUDY: FULL TIME

2-nd YEAR SYLLABUS (2025-2026)

Nr. crt.	Cod	Discipline obligatorii	Tipul disciplinei	SEMESTRUL I						SEMESTRUL II					
				Tip			Forma de verificare	Număr de credite	Tip predare	Tip			Forma de verificare	Număr de credite	Tip predare
				c.t.	I.p.	sem.				c.t.	I.p.	sem.			
1	DI.201	Relativistic nuclear Physics. Anomal states and phase transitions in nuclear matter	knowledge-deepening	2	2		exam	8	Face to face						
2	DI.202	Elementary particles phenomenology. Elements of Cosmology and astroparticle Physics.	knowledge-deepening	2		2	exam	8	Face to face						
3	DI.206	Research activity practice	knowledge-deepening								5		project assessment	15	Face to face
4	DI.207	Research activity and Dissertation thesis preparation	advanced knowledge								4		project assessment	5	Face to face
				4	2	2				0	9	0			
		Total ore discipline obligatorii / săptămână:		8				16		9				20	
		Discipline opționale													
1	DO.203.1/2	Nuclear fission and fusion. Nuclear reactors and nuclear energetics / Radioactive beams, nuclear bosonic condensation, and new types of nuclei	advanced knowledge	1	2		exam	7	Face to face						
2	DO.204.1/2	Nuclear magnetic resonance. Physical principles and applications / Atomic and molecular clusters	knowledge-deepening	2	2		exam	7	Face to face						
3	DO.208.1/2	Spectroscopic methods and techniques for investigation of the nuclear and subnuclear systems / Properties of atomic and molecular systems. Experimental models and techniques	advanced knowledge							2	1		exam	5	Face to face
4	DO.209.1/2	Lasers, plasma, and acceleration methods. Experimental applications at ELI-NP / Plasma physics in the study of nuclear, astrophysical, and cosmological processes	advanced knowledge							2	1		exam	5	Face to face
				3	4	0		14		4	2	0		10	
		Total ore discipline opționale / săptămână:		7				14		6				10	
		Total ore / săptămână		15				30		15				30	
		Total ore / an:		420											
		Total ore de curs: (din care 0% online)		154											

		Total ore activități practice: (din care 0% online)	266
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		Activități didactice cu credite peste cele prevăzute de legislație													
1		Defense of master thesis												10	Face to face

		Discipline facultative													
1	DFC.210	Complements of nuclear and photonuclear reactions	knowledge-deepening							2		2	exam	3	
2	DFC.211	Current experimental problems in Atomic and Nuclear Physics	knowledge-deepening							2	2		exam	3	
3	DFC.212	Nuclear security	knowledge-deepening							2	2		exam	4	
4	DFC.205/213	Volunteering	complementară				verificare	1					verificare	1	

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