

Anul I

UNIVERSITATEA DIN BUCUREȘTI

FACULTATEA DE FIZICĂ

DOMENIUL DE STUDII UNIVERSITARE DE MASTER : FIZICĂ

PROGRAMUL DE STUDII UNIVERSITARE DE MASTER: THEORETICAL AND COMPUTATIONAL PHYSICS (TCP)

DURATA STUDIILOR: 2 ANI (120 ECTS)

FORMA DE ÎNVĂȚĂMÂNT: CU FRECVENȚĂ

ANUL I – PLAN DE ÎNVĂȚĂMÂNT (anul universitar 2024-2025)

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	Quantum Statistical Physics	thoroughgoing	2		1	exam	7	Face to face							
2	DI.102	Group Theory and Applications in Physics	thoroughgoing	1		1	exam	6	Face to face							
3	DI.103	Ethics in Research	thoroughgoing	1			oral	3	Face to face							
4	DI.107	Relativistic quantum mechanics and Quantum electrodynamics	synthesis							2		2	exam	6	Face to face	
5	DI.108	Theory of Nuclear systems and photonuclear reactions	synthesis							2		1	exam	6	Face to face	
				4	0	2				4	0	3				
<b>Total ore discipline obligatorii / săptămână:</b>				6					16	7					12	
<b>Discipline opționale</b>																
1	DO.104.1	Nonlinear dynamics, chaos, physics of complex systems	synthesis	2		2	exam	7	Face to face							
	DO.104.2	Special chapters of Mathematics														
2	DO.105.1	Artificial intelligence and machine learning in theoretical physics	thoroughgoing	2	2		exam	7	Face to face							
	DO.105.2	Simulation methods in theoretical physics														
3	DO.109.1	Interaction of laser radiation with matter	synthesis							1	1		exam	6	Face to face	
	DO.109.2	Quantum Optics														
4	DO.110.1	Introduction to quantum theory of identical particles	synthesis							2		2	exam	6	Face to face	
	DO.110.2	Theory of critical phenomena														
5	DO.111.1	Quantum information and communication	synthesis							2	1	1	exam	6	Face to face	
	DO.111.2	Collision theory														
				4	2	2			14	5	2	3			18	
<b>Total ore discipline opționale / săptămână:</b>				8					14	10					18	
<b>Total ore / săptămână</b>				14					30	17					30	
<b>Total ore / an:</b>				434												
<b>Total ore de curs: (din care 0% online)</b>				238												
<b>Total ore activități practice: (din care 0% online)</b>				196												

Activități didactice cu credite peste cele prevăzute de legislație

Discipline facultative																
1	DFC.106	Volunteering	complementary				verification	1	Face to face							
2	DFC.112	Physics of mesoscopic systems	thoroughgoing							2		2	exam	4	Face to face	
3	DFC.113	Advanced methods for parallel computing	thoroughgoing							2	2		exam	4	Face to face	
4	DFC.114	Volunteering	complementary										verification	1	Face to face	

RECTOR,  
Prof.dr. Marian Preda

DECAN,  
Prof.dr. Lucian Ion

Anul II

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DURATA STUDIILOR: 2 ANI (120 ECTS)

FORMA DE ÎNVĂȚĂMÂNT: CU FRECVENȚĂ

**ANUL II – PLAN DE ÎNVĂȚĂMÂNT (anul universitar 2025-2026)**

Nr. crt.	Discipline obligatorii	Tipul disciplinei	SEMESTRUL I						SEMESTRUL II							
			Tip			Forma de verificare	Numar de credite	Tip predare	Tip			Forma de verificare	Numar de credite	Tip predare		
			c.t.	I.p.	sem.				c.t.	I.p.	sem.					
1	Introduction to quantum theory of fields	synthesis	2		2	exam	8	Face to face								
2	Introduction to gravity theory and cosmology	synthesis	2		2	exam	8	Face to face								
3	Research activity (traineeship – 180 hours)	de aprofundare								8		verificare	20	Face to face		
4	Finalization of master thesis (90 hours / 4 weeks)	de aprofundare								4		verificare	5	Face to face		
			4	0	4				0	12	0					
	<b>Total ore discipline obligatorii / săptămână:</b>						16			12			25			
	<b>Discipline opționale</b>															
1	Advanced methods in statistical physics/Computational methods for electronic structures of condensed systems	thoroughgoing	2	1		exam	7	Face to face								
2	Computational methods in modern physics/Theory of intense laser radiation interaction with atomic and nuclear systems	thoroughgoing	2	1		exam	7	Face to face								
3	Non-abelian gauge theories and standard model of elementary particles /Theory of hadronic matter in extreme conditions and quark-gluon plasma	thoroughgoing							2		1	exam	5	Face to face		
			4	2	0		14		2	0	1		5			
	<b>Total ore discipline opționale / săptămână:</b>			6			14			3			5			
	<b>Total ore / săptămână</b>			14			30			15			30			
	<b>Total ore / an:</b>			406												
	<b>Total ore de curs: (din care 0% online)</b>			140												
	<b>Total ore activități practice: (din care 0% online)</b>			266												

**Activități didactice cu credite peste cele prevăzute de legislație**

Public defense of master thesis													10	Face to face
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**Discipline facultative**

Computational approaches in high-energy physics	thoroughgoing	2	2		exam	3	Face to face									
Volunteering	complementary				verification	1	Face to face									
Extensions of the standard model of elementary particles	thoroughgoing							2		2	exam	3	Face to face			
Introduction to string theory	complementary							2		2	exam	4	Face to face			
Volunteering	complementary										verification	1	Face to face			

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