

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 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.	l.p.	sem.				c.t.	l.p.	sem.			
1	DI.101.TCP	Quantum Statistical Physics	thoroughgoing	2		1	exam	7	Face to face						
2	DI.102.TCP	Group Theory and Applications in Physics	thoroughgoing	1		1	exam	6	Face to face						
3	DI.103.TCP	Ethics and academic integrity	thoroughgoing	1			oral	3	Face to face						
4	DI.107.TCP	Relativistic quantum mechanics and Quantum electrodynamics	synthesis							2		2	exam	6	Face to face
5	DI.108.TCP	Theory of Nuclear systems and photonuclear reactions	synthesis							2		1	exam	6	Face to face
				4	0	2				4	0	3			
		Total ore discipline obligatorii / săptămână:			6			16			7			12	
Nr. crt.		Discipline opționale													
1	DO.104.1.TCP	Nonlinear dynamics, chaos, physics of complex systems	synthesis	2		2	exam	7	Face to face						
	DO.104.2.TCP	Special chapters of Mathematics													
2	DO.105.1.TCP	Artificial intelligence and machine learning in theoretical physics	thoroughgoing	2	2		exam	7	Face to face						
	DO.105.2.TCP	Simulation methods in theoretical physics													
3	DO.109.1.TCP	Interaction of laser radiation with matter	synthesis							1	1		exam	6	Face to face
	DO.109.2.TCP	Quantum Optics													
4	DO.110.1.TCP	Introduction to quantum theory of identical particles	synthesis							2		2	exam	6	Face to face
	DO.110.2.TCP	Theory of critical phenomena													
5	DO.111.1.TCP	Quantum information and communication	synthesis							2	1	1	exam	6	Face to face
	DO.111.2.TCP	Collision theory													
				4	2	2		14		5	2	3		18	
		Total ore discipline opționale / săptămână:			8			14			10			18	
		Total ore / săptămână			14			30			17			30	
		Total ore / an:		434											
		Total ore de curs: (din care 0% online)		238											
		Total ore activități practice: (din care 0% online)		196											

Activități didactice cu credite peste cele prevăzute de legislație

		Discipline facultative													
1	DFC.106.TCP	Volunteering					verificare	1							
2	DFC.112.TCP	Physics of mesoscopic systems	thoroughgoing							2		2	exam	4	Face to face
3	DFC.113.TCP	Advanced methods for parallel computing	thoroughgoing							2	2		exam	4	Face to face
4	DFC.114.TCP	Volunteering						3					verificare	1	
5	DFC.115.TCP	Data science and computational electronic structure meth	thoroughgoing	1	1		exam	3							Face to face

RECTOR,
Prof.dr. Marian Preda

DECAN,
Prof.dr. Lucian Ion

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ANUL II – PLAN DE ÎNVĂȚĂMÂNT (anul universitar 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.TCP	Introduction to quantum theory of fields	synthesis	2		2	exam	8	Face to face						
2	DI.206.TCP	Introduction to gravity theory and cosmology	synthesis							2		1	exam	5	Face to face
3	DI.207.TCP	Research activity	thoroughgoing							8			verificare	20	Face to face
4	DI.208.TCP	Finalization of master thesis	thoroughgoing							4			verificare	5	Face to face
				2	0	2				2	12	1			
		Total ore discipline obligatorii / săptămână:			4			8			15			30	
		Discipline opționale													
1	DO.202.1.TCP	Advanced methods in statistical physics							Face to face						
	DO.202.2.TCP	Computational methods for electronic structures of condensed systems	thoroughgoing	2	1		exam	7	Face to face						
2	DO.203.1.TCP	Computational methods in modern physics	thoroughgoing						Face to face						
	DO.203.2.TCP	Theory of intense laser radiation interaction with atomic and nuclear systems	thoroughgoing	2	1		exam	7	Face to face						
3	DO.204.1.TCP	Non-abelian gauge theories and standard model of elementary particles	thoroughgoing						Face to face						
	DO.204.2.TCP	Theory of hadronic matter in extreme conditions and quark-gluon plasma	thoroughgoing	2		2	exam	8	Face to face						
				6	2	2		22		0	0	0		0	
		Total ore discipline opționale / săptămână:			10			22			0			0	
		Total ore / săptămână			14			30			15			30	
		Total ore / an:	346												
		Total ore de curs: (din care 0% online)	132												
		Total ore activități practice: (din care 0% online)	214												

		Activități didactice cu credite peste cele prevăzute de legislație													
1		Public defense of master thesis												10	Face to face

Anul II

Discipline facultative													
1	DFC.205.TCP	Computational approaches in high-energy physics	thoroughgoing	2	2	exam	3	Face to face					
2	DFC.209.TCP	Extensions of the standard model of elementary particles	thoroughgoing						2		2	exam	3 Face to face
3	DFC.210.TCP	Introduction to string theory	complementary						2		2	exam	4 Face to face
4	DFC.211.TCP	Volunteering				verificare	1					verificare	1

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