Anexa 1 a planului de învățământ - rezultatele învățării
Programul de studii: **Theoretical and Computational Physics 2026/2027**

Rezultate ale învăţării	Cunoștințe	Aptitudini	Responsabilitate şi autonomie	Discipline
R1	The student/graduate explains fundamental and advanced laws of physics and their applications.	Uses advanced principles of classical, quantum, and statistical physics.	Presents scientific work clearly to both expert and general audiences.	DOB.101.TCP Quantum Statistical Physics, DOB.102.TCP Group Theory and Applications in Physics, DOB.109.TCP Relativistic quantum mechanics and Quantum electrodynamics, DOB.110.TCP Theory of Nuclear systems and photonuclear reactions, DOP.104.1.TCP Nonlinear dynamics, chaos,physics of complex systems
R2	The student/graduate derives and applies mathematical models to describe physical systems.	Applies mathematical methods for modeling and solving physics problems.	Manages independent and collaborative research projects effectively.	DOB.101.TCP Quantum Statistical Physics, DOB.102.TCP Group Theory and Applications in Physics, DOB.109.TCP Relativistic quantum mechanics and Quantum electrodynamics, DOB.110.TCP Theory of Nuclear systems and photonuclear reactions, DOP.104.1.TCP Nonlinear dynamics, chaos,physics of complex systems
R3	The student/graduate selects and uses appropriate analytical, numerical, and statistical methods.	Employs computational and numerical techniques for analysis and simulation.	Takes responsibility for applying suitable research methods.	DOB.110.TCP Theory of Nuclear systems and photonuclear reactions, DOP.104.1.TCP Nonlinear dynamics, chaos,physics of complex systems, DOP.104.2.TCP Special chapters of Mathematics, DOP.105.1.TCP Artificial intelligence and machine learning in theoretical physics, DOP.105.2.TCP Simulation methods in theoretical physics

R4	The student/graduate solves problems in theoretical and computational physics with modern tools.	Solves theoretical and applied problems using specialized software.	Organizes and interprets data rigorously and efficiently.	DOB.101.TCP Quantum Statistical Physics, DOB.102.TCP Group Theory and Applications in Physics, DOB.109.TCP Relativistic quantum mechanics and Quantum electrodynamics, DOB.110.TCP Theory of Nuclear systems and photonuclear reactions, DOP.104.1.TCP Nonlinear dynamics, chaos,physics of complex systems
R5	The student/graduate critically evaluates scientific results and formulates reliable conclusions.	Evaluates scientific literature and data with critical judgment.	Performs independent investigations with critical awareness.	DOP.105.2.TCP Simulation methods in theoretical physics, DFA.115.TCP Physics of mesoscopic systems, DFA.114.TCP Advanced methods for parallel computing, DOB.207.TCP Introduction to gravity theory and cosmology , DOB.208.TCP Research activity (traineeship – 180 hours)
R6	The student/graduate integrates knowledge across disciplines to address complex physical problems.	Connects physics with related scientific and engineering domains.	Integrates interdisciplinary approaches in research tasks.	DOB.101.TCP Quantum Statistical Physics, DOB.109.TCP Relativistic quantum mechanics and Quantum electrodynamics, DOB.110.TCP Theory of Nuclear systems and photonuclear reactions, DOP.104.1.TCP Nonlinear dynamics, chaos,physics of complex systems, DOP.105.1.TCP Artificial intelligence and machine learning in theoretical physics
R7	The student/graduate communicates effectively through scientific reports, presentations, and publications.	Prepares clear scientific communication and documentation.	Uses diverse information sources and digital tools responsibly.	DOB.101.TCP Quantum Statistical Physics, DOB.110.TCP Theory of Nuclear systems and photonuclear reactions, DOB.208.TCP Research activity (traineeship – 180 hours), DOB.209.TCP Finalization of master thesis (90 hours / 4 weeks), DOB.213.TCP Public defense of master thesis

R8	The student/graduate applies ethical standards, assumes responsibility, and demonstrates autonomy in research.	Applies good research practices and maintains academic integrity.	Shows autonomy, responsibility, and ethical awareness in professional activities.	DOB.103.TCP Ethics and academic integrity, DOB.208.TCP Research activity (traineeship – 180 hours), DOB.209.TCP Finalization of master thesis (90 hours / 4 weeks), DOB.213.TCP Public defense of master thesis
R9	The student/graduate contributes to teamwork and interdisciplinary projects, managing resources efficiently.	Collaborates across disciplines and manages research workflows.	Contributes actively to research teams and professional communities.	DOB.109.TCP Relativistic quantum mechanics and Quantum electrodynamics, DOB.208.TCP Research activity (traineeship – 180 hours), DOB.209.TCP Finalization of master thesis (90 hours / 4 weeks), DOB.213.TCP Public defense of master thesis , DFA.108.TCP Data science and computational electronic structure methods for soft-end bio-matter
R10	The student/graduate acquires civic competences.	The student/graduate improves communication skills.	Shows spirit of initiative and entrepreneurship.	DFA.106.TCP Volunteering, DFA.117.TCP Volunteering, DFA.206.TCP Volunteering, DFA.212.TCP Volunteering

Anexa 2 a planului de învățământ - matricea rezultatelor învățării

Disciplina \ Rezultat	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Nr rez
Quantum Statistical Physics	X	X		X		X	X				**5**
Group Theory and Applications in Physics	X	X		X							**3**
Ethics and academic integrity								X			**1**
Nonlinear dynamics, chaos,physics of complex systems	X	X	X	X		X					**5**
Special chapters of Mathematics		X	X	X							**3**
Artificial intelligence and machine learning in theoretical physics	X		X	X		X					**4**

Simulation methods in theoretical physics	X		X	X	X	X					**5**
Volunteering										X	**1**
Condensed state physics / Fizica stării condensate	X			X		X					**3**
Data science and computational electronic structure methods for soft-end bio-matter			X	X	X	X			X		**5**
Relativistic quantum mechanics and Quantum electrodynamics	X	X		X		X			X		**5**
Theory of Nuclear systems and photonuclear reactions	X	X	X	X		X	X				**6**
Interaction of laser radiation with matter	X	X	X	X		X					**5**
Quantum Optics	X	X		X		X					**4**
Introduction to quantum theory of identical particles	X	X		X		X					**4**
Theory of critical phenomena	X	X	X	X		X					**5**
Quantum information and communication	X	X		X		X					**4**
Collision theory	X	X		X		X					**4**
Advanced methods for parallel computing			X	X	X						**3**
Physics of mesoscopic systems	X	X			X						**3**
Linear response theory / Teoria răspunsului liniar	X	X									**2**
Volunteering										X	**1**
Introduction to quantum theory of fields	X	X	X	X		X					**5**
Advanced methods in statistical physics	X	X	X	X		X					**5**
Computational methods for electronic structures of condensed systems	X		X		X						**3**

Computational methods in modern physics	X										**1**
Theory of intense laser radiation interaction with atomic and nuclear systems	X	X	X	X	X	X					**6**
Non-abelian gauge theories and standard model of elementary particles	X	X	X	X	X	X					**6**
Theory of hadronic matter in extreme conditions and quark-gluon plasma	X	X	X	X	X						**5**
Computational approaches in high-energy physics			X	X	X	X					**4**
Volunteering										X	**1**
Introduction to gravity theory and cosmology	X	X	X	X	X	X					**6**
Research activity (traineeship – 180 hours)					X	X	X	X	X		**5**
Finalization of master thesis (90 hours / 4 weeks)					X		X	X	X		**4**
Extensions of the standard model of elementary particles	X	X	X	X	X	X					**6**
Introduction to string theory	X	X	X	X							**4**
Volunteering										X	**1**
Public defense of master thesis							X	X	X		**3**
Total	**26**	**22**	**19**	**26**	**13**	**22**	**5**	**4**	**5**	**4**	