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

Rezultate ale învăţării	Cunoștințe	Aptitudini	Responsabilitate şi autonomie	Discipline
R1	The student/graduate describes concepts, theories, principles, phenomena, and fundamental laws of physics (e.g., Archimedes' principle, Coulomb's law, the first law of thermodynamics).	The student/graduate appropriately uses concepts and methods specific to the modeling of physical phenomena (e.g., Maxwell's equations, the Schrödinger equation) in professional communication.	The student/graduate presents scientific or outreach papers and seminars (e.g., posters, workshops), adapting the content to the target audience.	DOB.103.P Classical Mechanics I / Mecanică fizică I, DOB.104.P Molecular physics and heat I / Fizica moleculară și căldură I, DOB.112.P Differential equations and Complex analysis / Ecuații diferențiale și analiză complexă, DOB.113.P Classical mechanics II / Mecanică fizică II, DOB.114.P Molecular physics and heat II / Fizică moleculară și căldură II
R2	The student/graduate appropriately uses concepts and methods specific to the modeling of physical phenomena in professional communication.	The student/graduate applies the principles and laws of physics (e.g., the laws of motion, the ideal gas law) in solving theoretical or practical problems, including in partially unpredictable situations.	The student/graduate manages technical or professional activities or projects (e.g., experiment planning, resource allocation), making decisions and coordinating teams in unforeseen situations.	DOB.103.P Classical Mechanics I / Mecanică fizică I, DOB.104.P Molecular physics and heat I / Fizica moleculară și căldură I, DOB.113.P Classical mechanics II / Mecanică fizică II, DOP.106.2.P Physical Chemistry / Chimie fizică, DFA.110.P General Chemistry / Chimie generală
R3	The student/graduate presents scientific or outreach papers and seminars (e.g., posters,	The student/graduate correlates statistical analysis methods (e.g., correlation coefficients, linear	The student/graduate takes responsibility for professional development (e.g., attending	DOB.203.P Electrodynamics and theory of relativity I / Electrodinamica și teoria relativității I, DOB.211.P

	workshops), adapting the content to the target audience.	regression) with experimental data, integrating the results and critically interpreting the obtained information.	conferences, participating in science outreach events), planning and evaluating their own progress.	Electrodynamics and theory of relativity II / Electrodinamica și teoria relativității II, DOB.215.P Thermodynamics and statistical physics / Termodinamică și fizică statistică, DOP.217.1.P Virtual instrumentation and data acquisition / Instrumentație virtuală și achiziție de date, DOP.312.2.P Elements of quantum optics / Elemente de optică cuantică
R4	The student/graduate explains and interprets concepts, theories, models, and principles of physics (e.g., the atomic model, the uncertainty principle), highlighting practical applications (e.g., experimental techniques, technological applications).	The student/graduate critically evaluates a scientific communication or a specialized report of low difficulty (e.g., a laboratory report, an introductory study), analyzing the arguments and conclusions presented.	The student/graduate responsibly carries out independent work tasks and contributes to interdisciplinary approaches (e.g., integrating physics knowledge into multidisciplinary projects).	DOB.103.P Classical Mechanics I / Mecanică fizică I, DOB.104.P Molecular physics and heat I / Fizica moleculară și căldură I, DOB.113.P Classical mechanics II / Mecanică fizică II, DOB.114.P Molecular physics and heat II / Fizică moleculară și căldură II, DOB.115.P Electricity and magnetism / Electricity and magnetism
R5	The student/graduate applies the principles and laws of physics in solving theoretical or practical problems, including in partially unpredictable situations.	The student/graduate collects and interprets data obtained from applying scientific methods (e.g., experimental design, sensor measurements), integrating the results into an analytical framework.	The student/graduate efficiently organizes their schedule and resources (e.g., time management, equipment handling), respecting deadlines and safety regulations.	DOB.103.P Classical Mechanics I / Mecanică fizică I, DOB.113.P Classical mechanics II / Mecanică fizică II, DOB.114.P Molecular physics and heat II / Fizică moleculară și căldură II, DOB.116.P Processing of physical data and numerical methods / Procesarea datelor fizice și metode numerice,

				DOP.106.2.P Physical Chemistry / Chimie fizică
R6	The student/graduate manages technical or professional activities or projects (e.g., experiment planning, resource allocation), making decisions and coordinating teams in unforeseen situations.	The student/graduate writes and presents a scientific or professional report (e.g., laboratory or research paper, scientific or academic poster), adhering to ethical requirements and quality standards.	The student/graduate independently uses information sources (e.g., databases, software applications in MATLAB or Python).	DOB.103.P Classical Mechanics I / Mecanică fizică I, DOB.113.P Classical mechanics II / Mecanică fizică II, DOB.114.P Molecular physics and heat II / Fizică moleculară și căldură II, DFA.110.P General Chemistry / Chimie generală, DOB.203.P Electrodynamics and theory of relativity I / Electrodinamica și teoria relativității I
R7	The student/graduate determines appropriate methods of analysis for specific situations in the field of physics (e.g., dimensional analysis, approximation methods).	The student/graduate prepares scientific reports and presentations (e.g., symposium presentation, popular science article), constructing logical and coherent arguments on general physics topics.	The student/graduate undertakes research internships in specialized units (e.g., research institutes, university laboratories), writing reports on the activities and results obtained.	DOB.104.P Molecular physics and heat I / Fizica moleculară și căldură I, DOB.114.P Molecular physics and heat II / Fizică moleculară și căldură II, DOB.115.P Electricity and magnetism / Electricity and magnetism, DOP.106.1.P Computer Programming (C/C++) / Programarea calculatoarelor (C/C++), DOP.106.2.P Physical Chemistry / Chimie fizică
R8	The student/graduate correlates statistical analysis methods (e.g., correlation coefficients, linear regression) with experimental data, integrating the results and	The student/graduate compares theoretical results from specialized literature (e.g., textbooks, indexed articles) with experimental ones, integrating the data into a professional report or	The student/graduate critically analyzes a specialized paper or scientific communication of medium difficulty (e.g., peer-reviewed article, scientific report),	DOP.106.1.P Computer Programming (C/C++) / Programarea calculatoarelor (C/C++), DFA.109.P Object oriented programming / Programare orientată pe obiecte, DOP.206.1.P Simulation methods in Physics / Metode de simulare în

	critically interpreting the obtained information.	project.	assuming the conclusions and recommendations.	fizică, DOB.304.P Particle physics / Fizica particulelor elementare, DOP.316.2.P Introduction to nanotechnologies / Introducere în nanotehnologii
R9	The student/graduate takes responsibility for professional development (e.g., attending conferences, participating in science outreach events), planning and evaluating their own progress.	The student/graduate deduces working formulas for calculations involving physical quantities , appropriately applying fundamental principles and laws.	The student/graduate demonstrates autonomy in operating, maintaining, and repairing laboratory equipment (e.g., sensor calibration, instrument adjustment), adhering to safety and quality standards.	DOB.103.P Classical Mechanics I / Mecanică fizică I, DOB.113.P Classical mechanics II / Mecanică fizică II, DOP.217.1.P Virtual instrumentation and data acquisition / Instrumentație virtuală și achiziție de date, DOP.216.2.P Plasma physics and applications / Fizica plasmei și aplicații, DOP.313.1.P Detectors dosimetry and radiation protection / Detectori, dozimetrie și radioprotecție
R10	The student/graduate deduces working formulas for calculations involving physical quantities, correctly applying fundamental principles and laws.	Students/graduates prepare and present, in English, scientific or outreach reports and communications, using appropriate technical language and logical argumentation.	Students/graduates take responsibility for interacting, contributing, and integrating into multilingual work teams and professional communities, demonstrating autonomy in using information sources in English.	DOB.111.P Equations of mathematical physics / Ecuațiile fizicii matematice, DOB.214.P Nuclear physics / Fizică nucleară, DOP.312.1.P Numerical methods in quantum mechanics / Metode numerice în mecanica cuantică, DOP.316.2.P Introduction to nanotechnologies / Introducere în nanotehnologii, DOP.207.1.P Python programming for physicists
R11	The student/graduate critically evaluates a	The student/graduate provides examples of the	The student/graduate uses logical thinking, analyzes	DOB.101.P Real analysis / Analiză reală, DOB.102.P Linear algebra /

	scientific communication or a specialized report of low difficulty (e.g., a laboratory report, an introductory study), analyzing the arguments and conclusions presented.	application of basic theoretical concepts and results to solve exercises and problems related to the topics covered in the curriculum subjects.	problem statements, and selects the specific method for solving problems from the topics covered in the curriculum subjects.	Algebră liniară, DFA.109.P Object oriented programming / Programare orientată pe obiecte, DOB.303.P Solid state physics / Fizica solidului, DOP.316.2.P Introduction to nanotechnologies / Introducere în nanotehnologii
R12	The student/graduate responsibly carries out independent work tasks and contributes to interdisciplinary approaches (e.g., integrating physics knowledge into multidisciplinary projects).	The student/graduate develops personal, interpersonal, and intercultural competencies through involvement in activities that promote self-awareness, empathy, effective communication, respect for diversity, and collaboration with individuals from different cultural backgrounds to achieve objectives.	The student/graduate becomes aware of responsibly assuming risks by taking initiatives, making decisions in uncertain situations, and managing consequences in an ethical and constructive manner.	DOP.106.1.P Computer Programming (C/C++) / Programarea calculatoarelor (C/C++), DOB.203.P Electrodynamics and theory of relativity I / Electrodinamica și teoria relativității I, DOB.211.P Electrodynamics and theory of relativity II / Electrodinamica și teoria relativității II, DOP.316.2.P Introduction to nanotechnologies / Introducere în nanotehnologii
R13	The student/graduate describes physical systems (e.g., thermodynamic systems, electrical circuits), using specific theories and tools to characterize them.	The student/graduate is able to read, understand, and translate specialized texts, extract relevant information from international scientific sources, and communicate orally and in writing in an autonomous and professional manner.	The student/graduate responsibly uses international information sources, respecting academic ethics standards and demonstrating initiative in learning specialized scientific language.	DOP.206.1.P Simulation methods in Physics / Metode de simulare în fizică, DOB.303.P Solid state physics / Fizica solidului, DOP.316.2.P Introduction to nanotechnologies / Introducere în nanotehnologii, DOP.217.2.P Physical methods for non-destructive testing / Metode fizice de control nedistructiv

R14	The student/graduate knows the basic vocabulary and specialized terminology in a foreign language in the field of physics, the structure of scientific texts and international academic communication formats.	The student/graduate is able to read, understand and translate specialized texts, extract relevant information from international scientific sources and communicate orally and in writing in an autonomous and professional manner.	The student/graduate uses information sources responsibly, respecting the norms of academic ethics and demonstrating initiative in learning the scientific language of the specialty.	DOP.106.1.P Computer Programming (C/C++) / Programarea calculatoarelor (C/C++), DOP.106.2.P Physical Chemistry / Chimie fizică, DOP.107.2.P Authoring and scientific dissemination / Autorat și diseminarea cunoașterii științifice, DFA.110.P General Chemistry / Chimie generală, DOB.202.P Analytical mechanics / Mecanica analitică
R15	The student understands and appropriates the professional ethics and ethical practices that characterize the scientific and academic community.	The student applies ethical principles in professional work, and respects intellectual property rights	The student applies independently ethical behaviors and skills including critical thinking, methodological rigor, professional integrity and responsibility towards the environment and community	DOP.107.1.P Etică şi integritate academica, DOP.107.2.P Authoring and scientific dissemination / Autorat și diseminarea cunoașterii științifice, DOB.203.P Electrodynamics and theory of relativity I / Electrodinamica și teoria relativității I, DOB.211.P Electrodynamics and theory of relativity II / Electrodinamica și teoria relativității II, DOP.315.1.P Semiconductor physics / Fizica semiconductorilor
R16	The student/graduate acquires civic competences, especially knowledge of social and political concepts and structures for active and democratic	The student/graduate develops communication skills in the mother tongue and/or an international language	Spirit of initiative and entrepreneurship – the ability to turn ideas into action	DOB.105.P Foreign language I / Limbă străină I, DOB.119.P Sports I / Educaţie fizică I, DOB.120.P Sports II / Educaţie fizică II, DFA.108.P Volunteering / Voluntariat, DFA.118.P Volunteering / Voluntariat

	participation of people			

Anexa 2 a planului de învățământ - matricea rezultatelor învățării

Disciplina \ Rezultat	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16	Nr rez
Real analysis / Analiză reală											X						**1**
Linear algebra / Algebră liniară											X						**1**
Classical Mechanics I / Mecanică fizică I	X	X		X	X	X			X								**6**
Molecular physics and heat I / Fizica moleculară și căldură I	X	X		X			X										**4**
Foreign language I / Limbă străină I																X	**1**
Computer Programming (C/C++) / Programarea calculatoarelor (C/C++)				X			X	X				X		X			**5**
Physical Chemistry / Chimie fizică		X		X	X		X							X			**5**
Etică şi integritate academica															X		**1**
Authoring and scientific dissemination / Autorat și diseminarea cunoașterii științifice														X	X		**2**
Volunteering / Voluntariat																X	**1**
Object oriented programming / Programare orientată pe obiecte								X			X						**2**
General Chemistry / Chimie generală		X		X		X	X							X			**5**
Equations of mathematical physics / Ecuațiile fizicii matematice										X							**1**
Differential equations and Complex analysis / Ecuații diferențiale și analiză complexă	X																**1**
Classical mechanics II / Mecanică fizică II	X	X		X	X	X			X								**6**

Molecular physics and heat II / Fizică moleculară și căldură II	X			X	X	X	X										**5**
Electricity and magnetism / Electricity and magnetism				X			X										**2**
Processing of physical data and numerical methods / Procesarea datelor fizice și metode numerice					X												**1**
Foreign language II																X	**1**
Volunteering / Voluntariat																X	**1**
Sports I / Educaţie fizică I																X	**1**
Sports II / Educaţie fizică II																X	**1**
Optics / Optică	X																**1**
Analytical mechanics / Mecanica analitică	X	X			X									X			**4**
Electrodynamics and theory of relativity I / Electrodinamica și teoria relativității I	X	X	X	X	X	X						X		X	X		**9**
Fundamentals of atomic physics / Bazele fizicii atomice	X			X													**2**
Foreign language II / Limbă străină II																X	**1**
Simulation methods in Physics / Metode de simulare în fizică		X					X	X					X				**4**
Systems theory / Teoria sistemelor				X													**1**
Python programming for physicists		X				X				X							**3**
Scientific computing techniques in C++						X				X							**2**
Volunteering / Voluntariat																X	**1**
Differential geometry and applications in physics / Geometrie diferențială și aplicații în fizică	X																**1**

Special topics in mathematics and equations of mathematical physics / Capitole speciale de matematică și ecuațiile fizicii matematice	X																	**1**
Electrodynamics and theory of relativity II / Electrodinamica și teoria relativității II	X	X	X	X	X	X						X		X	X			**9**
Quantum mechanics I / Mecanică cuantică I	X																	**1**
Electronics / Electronică				X		X	X											**3**
Nuclear physics / Fizică nucleară				X	X					X								**3**
Thermodynamics and statistical physics / Termodinamică și fizică statistică	X	X	X		X													**4**
Traineeship / Practica de specialitate (3 săpt. x 30 ore)																	X	**1**
Virtual instrumentation and data acquisition / Instrumentație virtuală și achiziție de date			X		X		X		X									**4**
Physical methods for non-destructive testing / Metode fizice de control nedistructiv						X							X					**2**
Parallel computer architecture and programming / Ahitecturi paralele și programare paralelă						X	X											**2**
Astrophysics and Planetology / Astrofizică și planetologie	X			X	X													**3**
Methods for data analysis and data mining / Metode de analiză a datelor. Data mining	X																	**1**
Introduction to radioastronomy / Introducere în radioastronomie	X																	**1**
Volunteering / Voluntariat																	X	**1**

Sports III / Educaţie fizică III																X	**1**
Quantum Mechanics II / Mecanică cuantică II	X																**1**
Molecular physics / Fizica moleculei	X			X	X		X										**4**
Solid state physics / Fizica solidului		X			X						X		X				**4**
Particle physics / Fizica particulelor elementare				X			X	X									**3**
Spectroscopy and lasers / Spectroscopie și laseri	X													X			**2**
Methods and techniques of presenting the results in physics / Metode și tehnici de prezentare a rezultatelor în fizică	X					X											**2**
History of Physics / Istoria fizicii	X					X											**2**
Volunteering / Voluntariat																X	**1**
Experimental methods in astrophysics and planetology / Metode experimentale în astrofizică și planetologie					X												**1**
Unconventional methods for energy production / Metode neconvenționale pentru producerea de energie		X		X	X		X										**4**
Research Activity (2 weeks x 30 hours) / Practica de specialitate																X	**1**
Numerical methods in quantum mechanics / Metode numerice în mecanica cuantică	X	X					X			X				X			**5**
Elements of quantum optics / Elemente de optică cuantică	X	X	X	X													**4**
Detectors dosimetry and radiation protection / Detectori, dozimetrie și radioprotecție		X		X	X		X		X								**5**

Radiation sources. Natural and induced radioactivity / Surse de radiații. Radioactivitate naturală și indusă	X	X		X			X		X									**5**
Introduction to polymers physics / Introducere în fizica polimerilor		X	X		X		X		X									**5**
Introduction to environmental physics / Introducere în fizica mediului	X	X	X	X	X	X												**6**
Semiconductor physics / Fizica semiconductorilor	X	X	X				X								X			**5**
Special topics in solid state physics / Capitole speciale de fizica solidului	X	X	X				X								X			**5**
Electronic devices and circuits / Dispozitive și circuite electronice				X			X											**2**
Introduction to nanotechnologies / Introducere în nanotehnologii	X	X	X	X	X		X	X		X	X	X	X	X				**12**
Volunteering / Voluntariat																X		**1**
Total	**29**	**22**	**10**	**24**	**20**	**14**	**21**	**5**	**6**	**6**	**5**	**4**	**4**	**10**	**6**	**14**		