PLAN OF REGULAR STUDIES Enrollment 2026/2027

Subject area of studies: **PHYSICS** duration: **4 semesters**

Type of studies: **REGULAR DAILY SECOND DEGREE**

University of Zielona Góra

FACULTY OF PHYSICS AND ASTRONOMY

No.		SUBJECT	Number of teaching hours	ECTS	Form of receiving a credit	Semester 1 Form of instruction L	T	D	L/S	Form of receiving a credit	ECTS	Semester 2 Form of instruction L	T	D	L/S	Form of receiving a credit	ECTS	Semester 3 Form of instruction L	T	D	L/S	Form of receiving a credit	ECTS	Semester 4 Form of instruction L	T	D	L/S	Form of receiving a credit	ECTS
1	General subjects module (basic and directional)	A. GENERAL SUBJECTS																											
2		English	30	2	E				**30**	**E**	**2**																		
3		Humanities course: Philosophy of Nature / Humanities course: Science Fiction for Physicists	15	2	c/m							**15**				**c/m**	**2**												
4		Social science course: Fundamentals of Economics / Social science course: Fundamentals of Business	30	3	c/m													**30**				**c/m**	**3**						
5		B BASIC SUBJECTS	0	0																									
6		Physics laboratory II	120	10	c/mc/m				**60**	**c/m**	**5**				**60**	**c/m**	**5**												
7		C. FIELD SUBJECTS																											
8		Topics in Theoretical Physics	60	4	E c/m	**30**	**30**			**E c/m**	**4**																		
9		Physics of condensed matter	60	6	E c/m													**30**	**30**			**E c/m**	**6**						
10		Quantum Mechanics	60	5	E c/m	**30**	**30**			**E c/m**	**5**																		
11		Nuclear and High-Energy Physics	60	6	E c/m													**30**	**30**			**E c/m**	**6**						
12		Applied Statistical Physics	60	5	c/m c/m	**30**	**30**			**c/m c/m**	**5**																		
13		Python Programming and AI in Scientific Computing	30	2	c/m				**30**	**c/m**	**2**																		
14		Introduction to atomic and molecular physics	60	4	E c/m							**30**	**30**			**E c/m**	**4**												
15		Introduction to Quantum Information and Quantum Computing	45	4	c/m c/m							**30**	**15**			**c/m c/m**	**4**												
16		Groundbreaking experiments in physics	30	2	c/m													**30**				**c/m**	**2**						
17		Laser Physics and Nonlinear Optics	60	6	E c/m													**30**	**30**			**E c/m**	**6**						
18		The Standard Model and Beyond	30	3	c/m													**30**				**c/m**	**3**						
19		Cosmological Structure Models	30	3	c/m																			**30**				**c/m**	**3**
20		Popularization of the Natural Sciences	30	3	c/m																						**30**	**c/m**	**3**
21		ELECTIVE SUBJECTS***																											
22		Master's Seminar	30	3	c/m																						**30**	**c/m**	**3**
23		Current Problems in Physics	30	2	c/m							**30**				**c/m**	**2**												
24		Monographic lecture I / Monographic lecture II*	30	3	c/m																			**30**				**c/m**	**3**
25		MASTER'S THESIS	0	12	c																							**c**	**12**
26		Master's Degree Examination	0	0	E																							**E**	
1	COMPUTER PHYSICS	Scientific computing with C++	60	4	E c/m	**15**			**45**	**E c/m**	**4**																		
2		Modeling and simulations of physical systems	60	5	E c/m							**30**			**30**	**E c/m**	**5**												
3		Physics of computer games	30	2	c/m										**30**	**c/m**	**2**												
4		Dynamics of nonlinear systems	30	2	E							**30**				**c/m**	**2**												
5		Web Application Programming	45	4	E c/m							**15**			**30**	**E c/m**	**4**												
6		Introduction to machine learning	60	4	E c/m													**15**			**45**	**E c/m**	**4**						
7		Monte Carlo methods	45	3	z/o z/o	**15**			**30**	**z/o z/o**	**3**																		
8		Simulations of Quantum Systems	60	6	E c/m																			**30**			**30**	**E c/m**	**6**
1	THEORETICAL PHYSICS	Advanced mathematical methods in physics	60	4	E c/m	**30**			**30**	**E c/m**	**4**																		
2		Symbolic Computation Packages	30	3	c/m										**30**	**c/m**	**3**												
3		Computer simulations	45	5	E c/m							**15**			**30**	**E c/m**	**5**												
4		Elements of Special and General Relativity	60	5	E c/m							**30**	**30**			**E c/m**	**5**												
5		Elements of Classical and Quantum Field Theory	60	4	E c/m													**30**	**30**			**E c/m**	**4**						
6		Symmetries and Group Theory in Physics	45	4	c/m c/m																			**30**	**15**			**c/m c/m**	**4**
7		Nonlinear Systems and an Introduction to Chaos Theory	45	3	c/m c/m	**15**	**30**			**c/m c/m**	**3**																		
8		Current Problems in Theoretical Physics	30	2	c/m																			**30**				**c/m**	**2**

No.		SUBJECT	Number of teaching hours	ECTS	Form of receiving a credit	Semester 1						Semester 2						Semester 3						Semester 4					
						Form of instruction				Form of receiving a credit	ECTS	Form of instruction				Form of receiving a credit	ECTS	Form of instruction				Form of receiving a credit	ECTS	Form of instruction				Form of receiving a credit	ECTS
						L	T	D	L/S			L	T	D	L/S			L	T	D	L/S			L	T	D	L/S		
1	COMPUTER ASTROPHYSICS	Astrophysics I	45	4	E c/m	**15**	**30**			**E c/m**	**4**																		
2		Astrophysics II	60	4	E c/m							**30**	**30**			**E c/m**	**4**												
3		Extragalactic astronomy and cosmology	30	2	c/m c/m							**15**	**15**			**c/m c/m**	**2**												
4		Advanced Orbital Dynamics	45	3	c/m c/m	**15**	**30**			**c/m c/m**	**3**																		
5		Astrophysics of compact objects	45	6	E c/m																			**15**	**30**			**E c/m**	**6**
6		Exoplanets	30	2	E c/m							**15**	**15**			**E c/m**	**2**												
7		Modern Radio Astronomy	30	2	c/m													**30**				**c/m**	**2**						
8		High-energy astrophysics	30	2	E													**30**				**E**	**2**						
9		Radiative processes in astrophysics	75	5	E c/m							**30**	**45**			**E c/m**	**5**												
1	MEDICAL PHYSICS	Dosimetry and Quality Control in Medical Physics	45	4	E c/m	**15**			**30**	**E c/m**	**4**																		
2		Statistical Analysis Software Packages	30	2	c/m										**30**	**c/m**	**2**												
3		Hardware and Software for Medical Physics	45	3		**15**			**30**	**c/m c/m**	**3**																		
4		Medical image analysis algorithms	60	5	E c/m							**30**			**30**	**E c/m**	**5**												
5		Mathematical methods in biophysics and medical physics	45	4	c/m c/m							**15**	**30**			**c/m c/m**	**4**												
6		History of Medical Physics	30	2	c/m							**30**				**c/m**	**2**												
7		Introduction to Bioinformatics	45	4	E c/m													**15**			**30**	**E c/m**	**4**						
8		Physics of fluids in biology and medicine	60	4	E c/m																			**30**			**30**	**E c/m**	**4**
9		Fundamentals of microbiology	30	2	c/m																			**30**				**c/m**	**2**

Common subjects	900	90	300	23	210	17	270	26	120	24
Speciality 1: COMPUTER PHYSICS	390	30	105	7	165	13	60	4	60	6
Speciality 2: THEORETICAL PHYSICS	375	30	105	7	135	13	60	4	75	6
Speciality 2: COMPUTER ASTROPHYSICS	390	30	90	7	195	13	60	4	45	6
Speciality 4: MEDICAL PHYSICS	390	30	90	7	165	13	45	4	90	6
Practice										
Sum COMPUTER PHYSICS	**1290**	**120**	**405**	**30**	**375**	**30**	**330**	**30**	**180**	**30**
Sum THEORETICAL PHYSICS	**1275**	**120**	**405**	**30**	**345**	**30**	**330**	**30**	**195**	**30**
Sum COMPUTER ASTROPHYSICS	**1290**	**120**	**390**	**30**	**405**	**30**	**330**	**30**	**165**	**30**
Sum MEDICAL PHYSICS	**1290**	**120**	**390**	**30**	**375**	**30**	**315**	**30**	**210**	**30**

Sum without Practice

COMPUTER PHYSIC	**1290**	**120**
THEORETICAL PHYSICS	**1275**	**120**
COMPUTER ASTROPHYSICS	**1290**	**120**
MEDICAL PHYSICS	**1290**	**120**

The study plan was approved by the Faculty Council for Education on April 2, 2025.

Blue color: all selective courses, * - common selective courses, *** - common selective courses within speciality

English, Graduate seminar I, II, General seminar- credit and mark
Lectures:**Elementary particle physics**- credit and mark
Lectures:**Extragalactic astronomy and cosmology**- credit and mark
Lectures:**Mathematical methods in biophysics and medical physics**- credit and mark