Speciality "Physics" / "Nuclear and Particle Physics MSc Programme"

Academic 2016/2017 year"(3 term, full-time training)

№	course code	Name of the course	Type of the subject	Term	ECTS credits	Hours				hours per week	E-exam or score during the term E/T
						All	Lectures	Seminars	Practical exersises		
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
In first and second semester the students choose at least four courses from "Optional courses - I group"											

Optional courses - the courses chosen have to add up at least 30 ECTS to the curriculum													
Optional course - I group													
at least 4 courses among the optional courses should be from optional courses I group													
1	**M**	**4**	**7**	**4**	**Standard model of the Strong and Electroweak Interactions**	**O**	**1**	**6**	**180**	**60**	**0**	**0**	**4 0 0**	**E**
2	**M**	**4**	**7**	**2**	**Symmetries in the Elementary Particle Physics**	**O**	**1**	**4,5**	**135**	**45**	**0**	**0**	**3 0 0**	**E**
3	**M**	**4**	**7**	**9**	**Nuclear Models**	**O**	**1**	**4,5**	**135**	**45**	**0**	**0**	**3 0 0**	**T**
4	**M**	**4**	**7**	**8**	**Nuclear Structure**	**O**	**1**	**6**	**180**	**45**	**15**	**0**	**3 0 0**	**E**
5	**M**	**4**	**6**	**5**	**Modelling of the Physics Process**	**O**	**1**	**6**	**180**	**30**	**0**	**30**	**2 0 2**	**T**
6	**M**	**4**	**7**	**5**	**Theory of Nuclear Reactions**	**O**	**1**	**6**	**180**	**45**	**15**	**0**	**3 1 0**	**E**
7	**M**	**4**	**7**	**1**	**Radioactivity in the Environment and Radioecology**	**O**	**1**	**7,5**	**225**	**30**	**0**	**45**	**2 0 3**	**E**
8	**M**	**1**	**1**	**1**	**Nuclear Electronics 2**	**O**	**2**	**9**	**270**	**45**	**0**	**45**	**3 0 3**	**T**
Optional course - II group													
9	**M**	**4**	**7**	**3**	**Weak Interactions of the Elementary Particles**	**O**	**1**	**6**	**180**	**60**	**0**	**0**	**4 0 0**	**E**
10	**M**	**4**	**6**	**9**	**Object-Oriented Programming**	**O**	**1**	**10,5**	**315**	**45**	**0**	**60**	**3 0 4**	**E**
11	**M**	**2**	**7**	**9**	**Theoretical astrophysics**	**O**	**2**	**6.0**	**180**	**60**	**15**	**0**	**4 1 0**	**E**
12	**M**	**2**	**8**	**3**	**Supersymmetries , quantum deformations and models of interacting systems**	**O**	**2**	**4,5**	**135**	**45**	**0**	**0**	**3 0 0**	**E**
13	**M**	**2**	**8**	**1**	**Introduction to the string and superstring theory**	**O**	**2**	**4**	**120**	**45**	**0**	**0**	**3 0 0**	**E**

14	M	4	6	3	Automatization of the physics experiment	O	2	4.5	135	45	0	0	3 0 0	E
15	M	1	0	3	Radiochemistry	O	2	7.5	225	30	0	45	2 0 3	T
16	M	0	1	2	Practical Chemistry	O	2	3,5	105	0	15	30	0 1 2	T
17	M	4	6	4	Mössbauer effect and Mössbauer spectroscopy	O	2	6	180	45	0	15	3 0 1	E
18	M	4	7	0	Radiation biophysics	O	2	4.5	135	45	0	0	3 0 0	E
19	M	4	6	6	Modern problems of the nuclear physics	O	2	4.5	135	45	0	0	3 0 0	E
20	M	0	0	5	Medical Image Processing and Analysis	O	1	3,5	105	30	0	15	2 0 1	E
21	M	4	7	6	Introduction to the high performance computing	O	2	4	120	30	0	15	2 0 1	T
22	M	4	7	7	Beyond the Standard Model	O	2	4,5	135	45	0	0	3 0 0	T
23	M	1	0	6	Metrology of ionizing radiation	O	1	6	180	30	0	30	2 0 2	E
24	M	4	8	8	Nuclear Reactions	O	1	4,5	135	45	0	0	3 0 0	E

Bachelor Degree Optional Courses														
25	E	1	0	5	Experimental Nuclear Physics	O	2	8	240	45	0	60	3 0 4	E
26	E	5	6	2	Theoretical Nuclear Physics	O	2	4	120	60	0	0	4 0 0	E
27	E	1	0	6	Dosimetry and Radiation Protection	O	1	8,5	255	45	0	60	3 0 4	E
					Модул “Radiation Biophysics and Radiation Protection”:									
28	M	4	8	2	- Radiation Biophysics and Radiation Protection - theory	O	1	3	90	45	0	0	3 0 0	E
29	E	5	2	1	- Dosimetry and Radiation Protection-Laboratory Course	O	1	6	180	0	0	75	0 0 5	E
30	E	1	0	7	Nuclear Electronics	O	1	6	180	45	0	45	3 0 3	E
31	E	5	3	3	Quantum Physics (subatomic physics for advanced students)	O	2	5	150	30	0	30	2 0 2	E
32	E	5	7	3	Introduction to Particle Physics	O	1	5	150	45	30	0	3 2 0	E
33	E	5	7	2	Introduction to Theoretical Particle Physics	O	2	3	90	45	0	0	3 0 0	E
34	E	5	8	4	Quantum Field Theory	O	2	7	210	60	30	0	4 2 0	E
35	E	1	0	3	Neutron Physics	O	2	5	150	45	30	0	3 2 0	E

36	E	5	8	2	Nuclear Reactions	O	1	4,5	135	45	15	0	3 1 0	E
37	E	3	8	0	Programming in UNIX Environment	O	2	2	60	30	0	0	2 0 0	E
38	E	3	7	9	Laboratory Course of Programming in UNIX Environment	O	2	4,5	135	0	0	45	0 0 3	E
39	E	5	6	3	Group Theory	O	1	3	90	45	0	0	3 0 0	E
40	A	3	1	8	Quantum Physics	O	2	8	240	60	30	0	4 2 0	E
41	E	3	8	6	Accelerators and detectors for Ionizing Radiation in Medicine	O	2	6	180	45	30	0	3 2 0	E
42	E				Information Technologies (Data Acquisition and Network Communications)	O	2	6	180	45	0	30	3 0 2	E

*) C – compulsory O – optional, F- facultative.
E - examination; R - rating

Practical work

№	код				Name of the practice	C, O, F	term	ECTS - credits	weeks	hours	Exam or score during the
					Research work	C	3	12	15	360	R
					Research seminar	C	3	3	15	90	R

Graduation

Graduation	ECTS - credits	First final examination first session	Second final examination second session
Diploma thesis defence	15	**February - March**	**June - July**

The syllabus is ratified by the Faculty council (Minutes №)

DEAN: