APPROVED BY

Vice-Rector for Academic Affairs

_____V.V. Dyomin

_____2016

Ministry of Education and Science
of The Russian Federation
National Research
Tomsk State University

Curriculum
Subject area
03.04.02 Physics
Physics Methods and Information Technologies in Biomedicine
Degree
Master of Science
Duration
2 years

No	Modules, disciplines, practices	Workload		Distribution by semesters				Types of learning	Forms of midterm assessment	Competencies
		ECTS	hours total/ in class	1	2	3	4			
Study block 1. Disciplines (modules)		**60**	**2160/600**	**22**	**25**	**13**				
Basic part		**15**	**540/156**	**7**		**8**				
1.1	Philosophic issues of natural science	2	72/24	2				Lecture, Seminar	Pass/fail exam	GC-2, GPC-7
1.2	Special physics practice	5	180/48	5				Lecture, Lab.	Exam	GPC-5, GPC-6, PC-1
1.3	Trends in physics	3	108/24			3		Lecture, Seminar	Exam	GC-1, GPC-4, GPC-7, PC-1, PC-4, PC-5

№	Name	Credits	Hours					Teaching forms	Assessment	Competencies
1.4	History and methodology of physics	2	72/24			2		Lecture, Seminar	Pass/fail exam	GC-1, GPC-7
1.5	Organization of scientific activity	3	108/36			3		Lecture, Practical task	Pass/fail exam	GC-3, GPC-1, GPC-2, GPC-3, PC-1, PC-4, PC-5
Optional part, including electives		**45**	**1620/444**	**15**	**25**	**5**				
1.6	Current methodology and innovative research in diagnosis, prevention and therapy of disease	6	216/60		6			Lecture, Seminar, Practical task	Exam	GC-3, GPC-1, GPC-2, SPC-1
1.7	Physical fields and forces in biological systems	3	108/24			3		Lecture, Lab, Seminar	Exam	GC-3, PC-1
1.8	High-performance computing in biomedicine	4	144/36		4			Lecture, Practical task	Exam	GC-3, GPC-5, PC-1
1.9	Methods of measurement and control in biomedicine	3	108/36	3				Lecture, Lab	Pass/fail exam	GC-3, GPC-1, GPC-6, PC-1
1.10	Safety of microbiological study	3	108/36		3			Lecture, Lab, Seminar	Pass/fail exam	GC-2, SPC-5, SPC-8
1.11	Animal models in research	2	72/24		2			Lecture, Lab, Seminar	Pass/fail exam	GC-3, SPC-4, SPC-7, SPC-8
1.12	Data analysis in biomedicine	3	108/24		3			Lecture, Practical task	Exam	GC-1, GPC-5, SPC-6
1.13	Molecular basis of health and pathologies	3	108/24		3			Lecture, Seminar, Practical task	Exam	GC-3, GPC-1, GPC-2, SPC-2, SPC-3
1.14	Computing in biomedicine	3	108/36	3				Lecture, Practical	Pass/fail exam	GC-1, GPC-5

								task		
Electives		**15**	**540/144**	**9**	**4**	**2**				
1.15	Data acquisition and processing systems in biomedicine	5	180/48	5				Lecture, Lab, Seminar	Exam	GC-3, GPC-1, GPC-5
	Matlab in modeling complex physical processes									
1.16	Laser methods in biomedicine	4	144/36	4				Lecture, Lab	Exam	GC-3, GPC-1, GPC-6, PC-1, SPC-8
	Laser therapy									
1.17	Optical methods in biomedicine	6	216/60		4	2		Lecture, Lab	Exam/ Pass/fail exam	GC-3, GPC-1, GPC-6, PC-1, SPC-8
	Fundamentals of spectroscopy									
Study block 2. Practices, including research		**54**	**1944**	**8**	**5**	**17**	**24**			
2.1	Research	42	1512	8	5	17	12		Pass/fail exam/ Pass/fail exam/ Pass/fail exam / Graded exam	GC-1–3, GPC-1–6, PC-1, 4, 5, SPC-1, 2, 3, 6, 8
2.2	Pre-graduation practice	12	432				12		Graded exam	GC-1–3, GPC-1–6, PC-1, 4, 5, SPC-1, 2, 3, 6, 8
Study block 3. Final state examination		**6**	**216**				**6**			
3.1	Master's Thesis Defense	6	216				6		Grade	GPC-1, PC-1, 4, 5, SPC-1, 3, 6, 8
Total		**120**	**4320**	**30**	**30**	**30**	**30**			

Dean of the Faculty of Physics _____ O.N. Tchaikovskaya