

APPROVED

Head of the Educational Department

\_\_\_\_\_ E.Y.Brel  
" \_\_\_\_ " \_\_\_\_\_ 2018

Ministry of Education and Science  
Russian Federation  
National research Tomsk State University

Academic plan 2018/2019

Subject area:  
03.04.02 – Physics  
"Biophotonics"

Qualification:

Master

Period of study:

2years

№	Program blocks, courses, practices	Total		Semesters				Kinds of educational work	Attestation	Formed competences
		Credits (1 credit=36 hours)	Hours General/Teaching	1	2	3	4			
<b>Block 1. Courses (51-60 credits)</b>										
<b>Basic courses (12-21 credits)</b>		<b>15</b>	<b>540/220</b>	<b>8</b>	<b>3</b>	<b>4</b>	<b>0</b>			
1.1	Philosophic problems of natural science	2	72/24	2				LP	C	GC-1 GC-2 GPC-2 GPC-7
1.2	Modern problems of physics	3	108/24	3				LP	E	GC-1 GC-3 GPC-2 GPC-3 GPC-4 GPC-6 PC-1 PC-2 PC-3 PC-4 PC-5
1.3	Computer modeling of structures of molecular systems	4	144/48			4		LP	G	GPC-2 GPC-5 GPC-6 PC-1 PC-2 PC-3
1.4	English for professional communication	6	216/124	3	3			P	CE	GC-2 GPC-1
<b>Variable courses (30-48 credits)</b>										
<b>Mandatory courses</b>		<b>25</b>	<b>900/200</b>	<b>8</b>	<b>17</b>	<b>0</b>	<b>0</b>			
1.5	Optics of biotissues	2	72/12	2				L	C	GPC-6 PC-1 PC-2 PC-3
1.6	Fundamentals of biophysics	2	72/12	2				L	C	GPC-6 PC-1 PC-2 PC-3 SPC-1
1.7	Quantum chemistry	2	72/22		2			LP	E	GPC-6 PC-1 PC-2
1.8	Physics of intermolecular interactions	3	108/22		3			LP	E	GPC-6 PC-1 PC-2
1.9	Analysis of complex biophysical signals	3	108/22		3			LP	G	GPC-5 GPC-6 PC-1 PC-2 SPC-1
1.10	Non-linear methods in biophysics	3	108/22		3			LP	E	GPC-5 GPC-6 PC-1 PC-2 SPC-1
1.11	Visualization methods in biology and medicine	2	72/18	2				LP	G	GPC-6 PC-1 PC-2 PC-3
1.12	Fundamentals of atomic and molecular spectroscopy	4	144/38	2	2			LP	GE	GPC-6 PC-1 PC-2 PC-3
1.13	Biomedical laser technologies	4	144/32		4			LP	G	GPC-5 GPC-6 PC-1 PC-2 PC-3 SPC-1
<b>Elective courses</b>		<b>11</b>	<b>396/130</b>	<b>1</b>	<b>2</b>	<b>8</b>	<b>0</b>			
1.14	Biomedical optics	3	108/34			3		LP	G	GPC-5 GPC-6 PC-1 PC-2 PC-3 SPC-3
1.15	Physical basis of optical sensors of molecular compounds	3	108/34			3		LP	G	GPC-5 GPC-6 PC-1 PC-2 PC-3 SPC-3
1.16	Spectroscopy of condensed medias in biology	1	36/12	1				L	G	GPC-6 PC-1 PC-2 PC-3 SPC-3

1.17	Luminescence analysis methods	1	36/12	1				L	G	GPC-6 PC-1 PC-2 PC-3 SPC-3
1.18	Organic chemistry	3	108/36			3		LP	G	SPC-6 PC-1 PC-2 PC-3 SPC-2
1.19	Photonics of organic molecules and systems on their base	3	108/36			3		LP	G	SPC-6 PC-1 PC-2 PC-3 SPC-2
1.20	Optical methods of diagnostics of cardiovascular and cancer diseases	2	72/24			2		LP	C	GPC-6 PC-1 PC-2 SPC-3
1.21	Neurophotonics	2	72/24			2		LP	C	GPC-6 PC-1 PC-2 SPC-3
1.22	Spectral methods in biomedicine	2	72/24		2			LP	C	GPC-6 PC-1 PC-2 PC-3
1.23	Specialized practice	2	72/24		2			LP	C	GPC-6 PC-1 PC-2 PC-3
<b>Block 2. Practices, including research work (51-63 credits)</b>		<b>63</b>	<b>2268</b>	<b>15</b>	<b>6</b>	<b>18</b>	<b>24</b>			
2.1	Research practice	18	648			18			G	GC-1 GC-2 GC-3 GPC-1 GPC-2 GPC-3 GPC-4 GPC-5 GPC-6 PC-1 PC-2 PC-3 PC-4 PC-5 SPC-1 SPC-2 SPC-3
2.2	Research work	21	756	15	16				G G	GC-1 GC-2 GC-3 GPC-1 GPC-2 GPC-3 GPC-4 GPC-5 GPC-6 PC-1 PC-2 PC-3 PC-4 PC-5 PC-6 PC-7 SPC-1 SPC-2 SPC-3
2.3	Pre-diploma practice	24	864				24		G	OGC-1 GC-2 GC-3 GPC-1 GPC-2 GPC-3 GPC-4 GPC-5 GPC-6 PC-1 PC-2 PC-3 PC-4 PC-5 SPC-1 SPC-2 SPC-3
<b>Block 3. Final attestation</b>		<b>6</b>	<b>216</b>				<b>6</b>			
3.1	Defence of the graduate qualification work	6	216				<b>6</b>		G	PC-1 PC-2 PC-3 PC-4 PC-5 SPC-1 SPC-2 SPC-3
<b>FTB</b>	<b>Optional class</b>	<b>2</b>	<b>72/24</b>				<b>2</b>			
4.1	Programming Techniques and Distributed Information Systems	2	72/24				2	LP	C	OPK-5 OPK-6 PC-1 PC-2 SPC-1
<b>Total</b>		<b>122</b>	<b>4392</b>	<b>32</b>	<b>28</b>	<b>30</b>	<b>32</b>			

**Notes:**

**Kinds of educational work:**

L – lecture

P – practices

**Attestation:**

C – credit test

E – exam

G – graded test

Head of Master's program \_\_\_\_\_ V.N. Cherepanov