COURSE DESCRIPTOR

№	Topic	Total, hours	Lectures, hours	Workshops (seminars), hours	Labs, hours	Self-study of the material, hours	Individual tasks, hours
full-time course form of study							
Module 1. Mathematical analysis of medical and biological information							
1	Functions. Setting functions. Derivative function.	2	0	2	0	0	0
2	The physical meaning of the derivative. Function analysis	2	0	2	0	0	0
3	Written test "Fundamentals of mathematical analysis of medical and biological information"	2	0	2	0	0	0
Module 2. Fundamentals of biomechanics, bioacoustics and hemodynamics							
1	Biomechanics. Fluid mechanics.	4	2	2	0	0	0
2	Physical bases of hemodynamics. Basic hemodynamic parameters	4	2	2	0	0	0
3	Mechanical properties of materials.	4	2	2	0	0	0
4	Mechanical oscillations and waves	4	2	2	0	0	0
5	Sound waves. Basics of acoustics.	2	0	2	0	0	0
6	Ultrasound and infrasound.	2	0	2	0	0	0
7	Substantive control work 2	2	0	2	0	0	0
Module 3. Thermodynamics of open biological systems. Biophysics of membrane processes.							
1	Thermodynamics of open biological systems. Biophysics of membrane processes	4	2	2	0	0	0
2	Biophysics of membrane processes	2	0	2	0	0	0
3	Bioelectric potentials	2	0	2	0	0	0
4	Substantive control work 3	2	0	2	0	0	0
Module 4. The effect of electric, magnetic and electromagnetic fields on biological objects.							
1	Electric field and electric current. The effect of an electric field on biological tissues	4	2	2	0	0	0
2	Magnetic field. Elements of magnetobiology.	4	2	2	0	0	0

№	Topic	Total, hours	Lectures, hours	Workshops (seminars), hours	Labs, hours	Self-study of the material, hours	Individual tasks, hours
3	The effect of electromagnetic fields on biological objects. Electronic medical equipment.	2	0	2	0	0	0
Module 5. Optics. Optical methods and their use in biology and medicine.							
1	Fundamentals of geometric optics	4	2	2	0	0	0
2	Optical eye system. Optical visual impairments and their correction.	2	0	2	0	0	0
3	Fundamentals of wave optics	4	2	2	0	0	0
Module 6. Ionizing radiation. X-rays. Radioactivity. Basics of dosimetry.							
1	Ionizing radiation. X-rays	4	2	2	0	0	0
2	Radioactivity, main types and properties	4	2	2	0	0	0
3	Fundamentals of ionizing radiation dosimetry.	2	0	2	0	0	0
4	Nanotechnology and nanomedicine	2	0	2	0	0	0
5	Final modular control	2	0	2	0	0	0
Total (full-time course form of study)		*72*	*22*	*50*	*0*	*0*	*0*
part-time course form of study							
Module 1. Mathematical analysis of medical and biological information							
1	Functions. Setting functions. Derivative function.	2	0	2	0	0	0
2	The physical meaning of the derivative. Function analysis	2	0	2	0	0	0
3	Written test "Fundamentals of mathematical analysis of medical and biological information"	2	0	2	0	0	0
Module 2. Fundamentals of biomechanics, bioacoustics and hemodynamics							
1	Biomechanics. Fluid mechanics.	4	2	2	0	0	0
2	Physical bases of hemodynamics. Basic hemodynamic parameters	4	2	2	0	0	0
3	Mechanical properties of materials.	4	2	2	0	0	0
4	Mechanical oscillations and waves	4	2	2	0	0	0

№	Topic	Total, hours	Lectures, hours	Workshops (seminars), hours	Labs, hours	Self-study of the material, hours	Individual tasks, hours
5	Sound waves. Basics of acoustics.	2	0	2	0	0	0
6	Ultrasound and infrasound.	2	0	2	0	0	0
7	Substantive control work 2	2	0	2	0	0	0
Module 3. Thermodynamics of open biological systems. Biophysics of membrane processes.							
1	Thermodynamics of open biological systems. Biophysics of membrane processes	4	2	2	0	0	0
2	Biophysics of membrane processes	2	0	2	0	0	0
3	Bioelectric potentials	2	0	2	0	0	0
4	Substantive control work 3	2	0	2	0	0	0
Module 4. The effect of electric, magnetic and electromagnetic fields on biological objects.							
1	Electric field and electric current. The effect of an electric field on biological tissues	4	2	2	0	0	0
2	Magnetic field. Elements of magnetobiology.	4	2	2	0	0	0
3	The effect of electromagnetic fields on biological objects. Electronic medical equipment.	2	0	2	0	0	0
Module 5. Optics. Optical methods and their use in biology and medicine.							
1	Fundamentals of geometric optics	4	2	2	0	0	0
2	Optical eye system. Optical visual impairments and their correction.	2	0	2	0	0	0
3	Fundamentals of wave optics	4	2	2	0	0	0
Module 6. Ionizing radiation. X-rays. Radioactivity. Basics of dosimetry.							
1	Ionizing radiation. X-rays	4	2	2	0	0	0
2	Radioactivity, main types and properties	4	2	2	0	0	0
3	Fundamentals of ionizing radiation dosimetry.	2	0	2	0	0	0
4	Nanotechnology and nanomedicine	2	0	2	0	0	0
5	Final modular control	2	0	2	0	0	0

№	Topic	Total, hours	Lectures, hours	Workshops (seminars), hours	Labs, hours	Self-study of the material, hours	Individual tasks, hours
Total (part-time course form of study)		*72*	*22*	*50*	*0*	*0*	*0*