

**Plan of Lectures
in Medical and Biological Physics
for the 1st Year Students of Faculty of Medicine
in the First Semester of 2023/2024 Academic Year**

No	TOPIC	Hours	Dates
1.	Cell membranes. Structural and functional organization of membranes. Membrane transport.	2	04.09
2.	Resting membrane potential. Mechanisms of action potential generation and propagation. Basic biophysical properties of ion channels.	2	18.09
3.	Elements of biomechanics. Biophysical foundations of rheology and hemodynamics.	2	02.10
	<i>In total</i>	6	

Lecturer – Dr. Sci., Prof. Roman FAFULA

**Plan of Laboratory and Practical Classes
in Medical and Biological Physics
for the 1st Year Students of Faculty of Medicine
in the First Semester of 2023/2024 Academic Year**

No	TOPIC	Hours	Dates 34 gr
1.	Thermodynamics of biological systems.	2	01.09
2.	Fundamentals of biophysics of membrane processes. Membrane transport.	2	15.09
3.	Membrane potentials. Resting membrane potential. Action potential. Propagation of the action potential in myelinated and non-myelinated nerve fibers.	2	29.09
4.	Fundamentals of biomechanics.	2	13.10
5.	Biophysics of muscle contraction.	2	27.10
6.	Fundamentals of bioreology. Study of rheological properties of biological fluids.	2	10.11
7.	Surface tension of biological fluids.	2	24.11
8.	Biophysics of the circulatory system.	2	08.12
	<i>In total</i>	16	

Coordinator of academic affairs _____ Associate professor OKSANA MALANCHUK

**Self-Study Plan
in Medical and Biological Physics
for the 1st Year Students of Faculty of Medicine
in the First Semester of 2023/2024 Academic Year**

No	TOPIC	Hours	Dates 43 gr
1.	Thermodynamics of irreversible processes.	4	01.09-14.09
2.	Elements of molecular biophysics.	4	15.09-28.09
3.	Physical and dynamic properties of biological membranes. Liquid crystalline state of biomembranes.	3	29.09-05.10
4.	Ionic currents in the membrane. Hodgkin-Huxley model. Equivalent electrical circuit of the biomembrane. The influence of medicinal substances on the membrane potential. The concept of channelopathies.	4	06.10-12.10
5.	Statics. Human locomotor system.	3	13.10-19.10
6.	Biophysics of smooth muscles. Biomechanics and energetics of heart muscle.	3	20.10-26.10
7.	Models for the study of blood circulation. Measurement of blood flow rate.	2	27.10-09.11
8.	Biophysics of voice.	3	10.11-23.11
9.	Biophysics of perception of smell, taste and touch.	3	
10.	Basics of medical equipment.	2	24.11-07.12
11.	Biomagnetism. Physical foundations of the use of magnetic fields in medicine.	2	08.12-21.12
12.	Laws of geometric optics. Refractometry.	1	
13.	Optical microscopy, types of microscopes and their characteristics.	2	
14.	Electron microscopy.	2	
<i>In total</i>		38	

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