Academic year: 2022-2023, Spring semester

BIOPHYSICS

Syllabus of Lectures

16.2. Introduction, structure of lectures and exercises. Basic statistical concepts and terms.

23.2. Molecular biophysics, nonbonding interaction, dissociation, capillary effects. Colloids and their properties (phase interface), colligative properties.

2.3. The cell membrane, electrical phenomena on the membrane, active transport, action potentials and their measuring. Effects of electric current on a living organism and its use in medicine.

9. 3. Biocybernetics.

16.3. Acoustics, Ultrasound and its use in pharmacy and medicine.

23.3. The statistical methods used in biophysics and their applications.

30.3. Optical system of the eye. Optics. Optical geometrical devices - microscope, fiber optics - endoscopy.

6. 4. Structure of Matter. Interaction of matter and electromagnetic radiation.

13. 4. Biomechanics, physics of bones joints and muscles, mechanical work of the heart.

20.4. Non-ionizing electromagnetic radiation. Properties of radiation. Radiation sources and detectors. The influence of visible light, UV radiation and IR radiation to organism. Reactive oxygen and nitrogen species.

27.4. Ionizing radiation. types, interaction with matter. Methods of detection. Interaction of ionizing radiation with living matter, its use in medicine.

4. 5. The properties of gases and liquids, fluid mechanics. Blood flow in the bloodstream. The solubility of gases in liquids, biophysics of breathing.

11. 5. Consultation

18.5. Medicinal imaging. Thermics, thermoregulation.

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