

BIOPHYSICS SYLLABUS

FIRST YEAR STUDENTS OF MEDICINE

2012 – 2013

1. Basics of cybernetics. Feedback and control. Modelling biological systems.
2. First principle of thermodynamics. Enthalpy.
3. Second principle of thermodynamics. Entropy.
4. Types of biological membranes. Molecular structure of biomembranes.
5. Mechanical properties of biomembranes.
6. Passive transport of neutral particles.
7. Passive transport of ions.
8. Active transport systems.
9. Resting potential of biomembranes.
10. Action potential of excitable biomembranes.
11. Propagation of the action potential.
12. Surface electric charge of cells.
13. Electrophoresis. Applications in medicine.
14. Cell processes, induced by ionising radiation.

LITERATURE

1. R.Cotterill, Biophysics – An Introduction, Wiley, 2004.
2. R.K.Hobbie, Intermediate Physics for Medicine and Biology, Springer, 2007.
3. P.Davidovits, Physics in Biology and Medicine, Harcourt Academic Press, 2008.
4. Handouts.