COURSE DETAIL

BIOPHYSICS OF PROTEINS, DNA AND MEMBRANES
Country Denmark
Host Institution University of Copenhagen
Program(s) University of Copenhagen
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Physics
UCEAP Course Number 105
UCEAP Course Suffix
UCEAP Official Title BIOPHYSICS OF PROTEINS, DNA AND MEMBRANES
UCEAP Transcript Title BIOPHYSICS PROTEINS
UCEAP Quarter Units 6.00
UCEAP Semester Units 4.00

Course Description
This focuses on the thermodynamics of biological systems. These are in particular biological macromolecules (proteins and nucleic acids), membranes, and the interactions between them. The course includes a brief introduction into concepts of thermodynamics and statistical thermodynamics. Topics are (amongst others): protein binding, protein and DNA folding, cooperative transitions (helix coil transitions, denaturation, allosteric reactions), cold denaturation, etc. The second major topic is biological membranes, which are those components of a biological cell that separate the functional units and form the special boundaries of the organelles. The major building block is the lipid bilayer into which proteins are embedded. Membranes maintain the chemical potentials of the cell components, and regulate transport. The membrane proteins have many catalytic and transport properties. The membranes themselves display all kinds of interesting physical properties; they can melt and they are characterized by elastic constants, which are important for membrane fusion and structural changes and depend on the melting. Furthermore, membranes may be permeable to certain molecules and they form lateral domains of their components, which are highly discussed in the context of cell signaling. The course introduces into the thermodynamics of membranes, their electrostatics, the hydrophobic effect, elastic theory and lipid-protein interactions.

Language(s) of Instruction
English

Host Institution Course Number
NFYB15000U

Host Institution Course Title
BIOPHYSICS OF PROTEINS, DNA AND MEMBRANES

Host Institution Course Details

Host Institution Campus
Science

Host Institution Faculty
Host Institution Degree
Host Institution Department Niels Bohr Institute
Course Last Reviewed

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