

PHYS 70400
Introduction to Biophysics
(1 credit)

- What is biophysics?
- A brief history, famous biophysicists: from Galvani to Crick and beyond.
- A brief survey of methods and techniques: I experimental methods; II theoretical and computational methods.
- Scaling laws in biology: from ecosystems to genomes.
- Statistical biophysics: open systems, competition between entropy and energy; the biosphere as a thermal engine.
- A brief summary of cell structure and its building blocks: functional hierarchies.
- Energy landscapes: the protein-folding problem.
- Selected topics:
 - Virus assembly. Geometry and elasticity of the viral capsid;
 - Molecular motors;
 - Networks of the cell: from gene transcription to cell signaling and metabolism;
 - Life elsewhere: a brief survey of topics in astrobiology.

Level:

- First-year graduate students

Counts as:

- For graduate students: A one-credit course that counts towards the breadth requirement.

Offered: Every fall.

PHYS 70400. Introduction to Biophysics
(1-0-1) Toroczka

An introduction to the area of biophysics, starting with a brief history of famous biophysicists (from Galvani to Crick and beyond) and a brief survey of methods and techniques (experimental and theoretical/computational). Also covered: Scaling laws in biology, from ecosystems to genomes; statistical biophysics, including open systems, competition between entropy and energy; the biosphere as a thermal engine; a brief summary of cell structure and its building blocks, including functional hierarchies; and energy landscapes and the protein-folding problem. Selected topics to cover include virus assembly and the geometry and elasticity of the viral capsid; molecular motors; networks of the cell, from gene transcription to cell signaling and metabolism; and life elsewhere, a brief survey of topics in astrobiology. Counts towards the breadth requirement for first-year graduate students.