

# Syllabus

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- Thermodynamics like Einstein
- (Bio)Polymers
- Membranes
- Microfluidics
- Molecular Machines

- Introduction, the origin of biological physics
- Introduction to Thermodynamics
- Thermodynamics like Einstein
- Diffusion
- Polymer Physics I
- Polymer Physics II
- Elasticity of Biopolymers – Worm Like Chain
- Single Molecule under Force
- Enzymes and Motors
- The Cytoskeleton

- Life at Low Reynolds Numbers: The Navier Stokes Equation
- Microfluidics
- Microswimmers
- Polymers under Flow
- Phase Transitions and Landau Theory
- Membranes as 2D soft films
- Phase transitions in Lipid membranes
- Electrostatics of Membranes
- Ion Channels
- Nerve Pulse Propagation
- Anesthesia
- Elasticity of Membranes
- Adhesion of Membranes and Cells