

1	Intro	energy conversion, order vs. disorder & entropy, Free Energy as a determinant of thermodyn. equilibrium
2	Bio base facts	molecular building blocks of cells
3	Physics base facts	molecular interaction mechanisms & energies , thermal energy; Bjerrum length, Van-der Waals interaction & dispersion, H-bonds, hydrophobic interaction
4	Thermal disorder	statistical tools, Boltzmann distribution, Maxwell-Boltzmann distribution of speeds
5	Molecular conformations	statistical weights & partition function; polymer statistics, Gaussian distribution and the Central Limit Theorem
6	Random walks & diffusion	Brownian motion, friction & dissipation; diffusion constant, Fick's laws & transport; Einstein relation
7	Thermodynamics	entropy & Free Energy revisited; entropic forces, reaction kinetics, two-level systems, depletion forces, electrostatics
8	Chemical forces & molec. self-assembly	chemical potential & reaction equilibria; ligand binding, cooperativity; detergent self-assembly & membrane mechanics