

<b>Molecular Statistical Thermodynamics (CHM 241)</b> <b>QB3 room 212 M, W 10:00-12:00 Sept. 2009</b>
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Sep 25	Maximum Entropy Principle. Lattice Models	KD
Sep 28	Math refresher (optional)	TA's
Sep 30	The First Law: Heat and Work.	KD
Oct 05	Entropy and the Boltzmann Distribution.	KD
Oct 07	Thermodynamic Driving Forces. Concept of Equilibrium	KD
Oct 12	Thermodynamic Potentials: Free Energy and Enthalpy.	KD
Oct 14	Maxwell's Relations.	KD
Oct 19	Boltzmann Distribution Law. Partition Functions.	KD
Oct 21	Equilibrium Constants.	KD
<b>Oct 23</b>	<b>Midterm exam</b>	
Oct 26	Condensed phases: Liquids and Solids. Surface Tension.	KD
Oct 28	Solutions & Mixing. Transfer properties	KD
Nov 02	Chemical Potential. Dimerization.	CV
Nov 04	Physical Kinetics. Diffusion, Transport, Permeation.	CV
Nov 09	Chemical Kinetics and Catalysis.	DS
<b>Nov 11</b>	<b>No class (Veteran's Day)</b>	
<b>Nov 16</b>	<b>No class BBC Retreat?</b>	
Nov 18	Coulomb's law.	CV
Nov 20 (Fri)	Special Lecture, "Life after UCSF"	JP + DS
Nov 23	Electrochemical Potential, Salts, Ions	CV
Nov 25	Phase Equilibria.	CV
Nov 30	Binding Polynomials	CV
Dec 02	Biomolecular machines.	CV
<b>Dec 04</b>	<b>Final Exam</b>	

**Aim:** What are the stable states of biomolecules? How do molecules interact? What forces drive molecules to bond and associate, to adsorb, to permeate through membranes, to undergo chemical reactions, to undergo conformational changes? Why are some changes gradual, as in the weakening of a ligand interaction with temperature, and others sudden (cooperative) such as protein folding or the insolubility of oil in water? These questions are addressed by statistical thermodynamics, a collection of principles and models that when combined with thermodynamics, aim to explain molecular forces and flows.