

Lecture Schedule (updated 9/12/16)

* indicates lectures to 12:15

Gases, Statistical Thermodynamics and Kinetic Theory of Gases

W1	1.1-1.4	Systems and states, zeroth law, ideal gas law, Dalton's Law	8/24 W
	1.5-1.10	Nonideal gas laws, expansion/compressibility	8/26 F
W2	1.7-8, 17.1-3	Probability statistics, average value, ensemble	8/29 M
	17.1-17.4	Canonical ensemble, maximizing $\ln \Omega$	8/31 W
	17.3-17.5	Translational partition function, ideal gas law	9/2 F
W3	19.3-19.5	Kinetic theory, Boltzmann distribution, mean velocity	9/7 W
		Quiz 1 and Problem session: Chapter 1, 17, 19	9/9 F*

The Laws of Thermodynamics, Enthalpy and Chemical Potential

W4	19.4-19.6	Collisions, mean free path, effusion and diffusion	9/12 M
	2.1-2.4	Reversible/irreversible work, heat, calorimetry, heat capacity, first law	9/14 W
		EXAM I (material through 9/9 F)	9/16 F
W5	2.3-2.7	Internal energy and enthalpy, heat capacity relationships	9/19 M*
	21.8-21.9, 3.1-3.2	Lattice energy, defects, heat capacity	9/21 W*
		No class	9/23 F
W6	3.1-3.6	Spontaneity, Carnot cycle, second law, entropy changes	9/26 M
	3.7-3.8	Boltzmann and 3rd Law, spontaneity	9/28 W
		Quiz 2 and Problem session: Chapters 2, 3	9/30 F*
W7	4.1-4.3	Gibbs and Helmholtz free energies	10/3 M
	4.4-4.6	Partial derivatives and Maxwell relationships	10/5 W
		EXAM II (material through 9/30 F)	10/7 F

Chemical Equilibrium and Phase Diagrams

W8	4.7-4.10	Gibbs energy change, chemical potential and fugacity	10/10 M
	5.1-5.3	Extent of reaction, free energy changes, Nernst equation	10/12 W
W9	5.2-5.5	Solutions, condensed phases, changes in equilibrium constants	10/19 W
		Quiz 3 and Problem session: Chapters 4, 5	10/21 F*
W10	5.4-5.7	Aqueous solutions, amino acid equilibria	10/24 M
	6.1-6.3	Single-component phase diagram, phase transitions	10/26 W
	6.4-6.5	Clapeyron equation and gas phases	10/28 F
W11		EXAM III (material through 10/24 M)	10/31 M
	6.6-6.8	Phase rule and chemical potential	11/2 W
	7.1-7.3	Gibbs phase rule, liquid-liquid systems and Raoult's Law	11/4 F
W12	7.4-7.6	Nonideality, liquid/gas systems and Henry's Law	11/7 M
	7.7-7.9	Solid-solid phase diagrams and colligative properties	11/9 W
		Quiz 4 and Problem session: Chapters 6, 7	11/11 F*

Electrochemistry, Kinetics and Crystals

W13	8.1-8.4	Charges, energy and work, standard and nonstandard potentials	11/14 M
	8.4-8.7	Equilibrium constants, ions in solution, Debye-Hückel theory	11/16 W
		EXAM IV (material through 11/11 F)	11/18 F
W14	8.6-8.9	Debye-Hückel theory, transport and conductance	11/21 M
W15	20.1-20.3	Rates, rate laws and method of initial rates	11/28 M
	20.4-20.6	Equilibrium, parallel and consecutive reactions, Arrhenius expression	11/30 W
	20.7-20.9	Mechanism and steady state approximation	12/2 F
W16	20.10-20.11	Chain, oscillating reactions and transition state theory	12/5 M
		FINAL EXAM	8:00 12/8 R