

058:140 INTERMEDIATE THERMODYNAMICS
Instructor: Pablo M. Carrica

Spring 2003

SYLLABUS

Date	Class	Subject		
January	22	1	Introduction. Review: First Law.	
	24	2	Review: Second law.	
	27	3	Review: Entropy. Exergy.	
	29	4	Review: Exergy (continued).	
	31	5	Review: Cycles.	
February	3	6	Review: Governing Equations.	
	5	7	Equations of state: PVT behavior.	
	7	8	Equations of state: Two-parameter EOS's. The corresponding states principle.	
	10	9	Equations of state: Other EOS's.	
	12	10	Thermodynamic properties: Fundamentals.	
	14	11	Thermodynamic properties: Maxwell relations. Generalized relations.	
	17	12	Thermodynamic properties: Measurable derivatives.	
	19	13	Thermodynamic properties: Residual property functions.	
	21	14	Thermodynamic properties: Properties of the saturation state.	
	24	15	Thermodynamic properties: The third law. Specific heat of a solid	
	26	16	Thermodynamic properties: Einstein and Debye theories.	
	28	17	Homogeneous Mixtures: Partial molar properties.	
	March	3	18	Homogeneous Mixtures: Partial molar properties. (continued)
		5	19	Homogeneous Mixtures: Partial molar properties. Fugacity.
7		20	Fugacity (continued)	
10		21	Fugacity for real gas mixtures.	
12		22	Fugacity in ideal solutions.	
14		23	Fugacity: Enthalpy-composition diagram.	
24		24	<i>Mid-Term Exam.</i>	
26		25	Multiphase-Multicomponent Systems. Equilibrium.	
28		26	Phase equilibrium and mass transfer.	
31		27	Vapor-liquid equilibrium.	
April		2	28	Phase equilibrium of ideal binary solutions.
	4	29	Phase equilibrium of ideal binary solutions (continued).	
	7	30	Phase equilibrium of ideal binary solutions (continued).	
	9	31	Total pressure and vapor pressure.	
	11	32	Boiling point elevation and freezing point depression.	
	14	33	Boiling point elevation and freezing point depression. Osmotic pressure.	
	16	34	Osmotic pressure. Absorption refrigeration.	
	18	35	Drops.	
	21	36	Bubbles. Phase change rate.	
	23	37	Boiling heat transfer and thermodynamics.	
	25	38	Metastable states.	
May	28	39	Chemical Reactions. Thermochemistry.	
	30	40	Second law. Availability.	
	2	41	Work production from chemical reactions.	
	5	42	Term paper presentations	
	7	43	Term paper presentations	
	9	44	Review	
	14	45	Final Exam: 14:00 – 16:00 hs.	