

GENERAL CHEMISTRY FOR ENGINEERS (01:160:159)

SYLLABUS

FALL 2010

LEC#	DATE	LECTURE [†]	PAPER HOMEWORK PROBLEMS (TO BE DISCUSSED IN RECITATION)	ONLINE ANIMATION, ONLINE ASSIGNMENT DUE DATES [†]
1	09/02; 9/03	1.1,2,3,4	1: 3, *F2, 7, F4, 21,27,75,16,25,29, 32,38,40. (*See note)	
2	09/07	1.4; Appendix pp.817-9; 1.5;2.1	1: 45, F9, 47,48,50,54,73; 2: 4.	
3	09/09; 9/10	2.2,3,4	2: 7, 10,12,14,16.	
4	09/14	2.5,6,7,8	2: 24,27,33, F5, 38,39,41,85, F6,47,52,54,55,60,64,65,75.	Chapt 1 (Chemistry)
****Quiz I in Recitation 09/14, 09/16, 09/17 on Sections 1.1-5; pp.817-9;2.1-6.				
5	09/16; 9/17	2.8,9; 3.1,2	2: F12, 68,69, F13, 79,80,81,83; 3: 1, 2, 3,11,17,23,27,30, F4, 34.	
6	09/21	3.2,3,4	3: 35,37, F7, 46,50,61,79,84,95,98,99.	Chapt 2 (Matter)
7	09/23; 9/24	3.5; 4.1,2,3	3: 69,70,71,72,77; 4: 8,10,11,12,16,24,25,26,27,28.	
8	09/28	4.4,5 OMIT Sec. 4.6	4: 38,39,41,43, F6, 50,52,54,56,60, 80,84.	Chapt 3 (Stoichiometry)
****Quiz II in Recitation 9/28, 09/30, 10/01 on Sections 3.1-5 & 4.1-4.				
9	09/30; 10/1	4.5; 5.1,2,3	5: 7,11,12,15,17,19,23, F4.	
****	10/05	OPTIONAL REVIEW IN LECTURE FOR EXAM. RECITATION AS USUAL.		
****	Tuesday Oct. 5	EXAM I 9:40-11:00PM	Exam I covers 1 - 5.2	
10	10/07;10/08	5.3,4,5	5: 34, F9, 38,40, F10, 69,83,95,101,44,45,77,80.	
11	10/12	5.6; 6.1,2 OMIT Section 5.7	5: 58,59,60,62,63; 6: F1, 15,60.	Chapt 4 (Chemical Rxns)
12	10/14; 10/15	6.2,3	6: 22,25,26, F4, 29,32, F5.	
13	10/19	6.3,4,5,6	6: 41, F7, 49,51,52,53,55,70,82.	Chapt 5 (Gases)
14	10/21; 10/22	7.1,2	7: F1, F2, 55,58,62,18,19,21,25,53.	
15	10/26	7.2,3,4	7: F4, 74, 71, F5, F6, F7, 39,40,42,44,46,48.	Chapt 6 (Thermochem)
****Quiz III in Recitation 10/26, 10/28, 10/29 on Sections 5.3-6; 6.1-6; 7.1-3.				
16	10/28; 10/29	7.4; 8.1,2,3	8: 8, 9,12,20,22,28,31,32.	
17	11/02	8.3,4,5	8: F3, F5, 33,35,37,38,42,47, F6, 57,59,64.	Chapt 7 (Atom)
18	11/04; 11/05	8.5; 9.1,2	9: 6, 7, 8,10, F1, 13,18,20,21,58.	
****	11/09	OPTIONAL REVIEW IN LECTURE FOR EXAM. RECITATION AS USUAL.		
****	Tuesday Nov.9	EXAM II 9:40-11:00PM	Exam II covers 5.3 - 9.2 (excluding omitted material).	
19	11/11; 11/12	9.3,4,5	9: F2, 27,28,34,36,59, F4, 46,53.	
20	11/16	9.5; 10.1	10:F1, 7, 9,11,19, F5, 22,65,75,80.	Chapt 8 (Electron Config)
21	11/18; 11/19	10.1,2	10:F7, 35,39,40,41,45,50.	
22	11/23	10.2,3; 11.1	10:53,54; 11: 7, 8, 9,10, F1, 15,17.	Chapt 9 (Bonding)
****Quiz IV in Recitation 11/30, 12/02, 12/03 Sections 8.3-8.5;9.1-5;10.1-10.3				
23	11/30	11.1,2	11:F2, 20,23,43,56.	Chapt 10 (Shapes of Molec)
24	12/02; 12/03	11.3	11:26,28,33,34,35,36,37.	
25	12/07	pp.388-391; 12.3	12:62,63,64,65,77; 12:25,30,36,42, F4.	Chapt 11 (Bonding Theories)
26	12/09; 12/10	12.3,4,5	12:47,49,53,54,56.	
	12/10			Chapt 12 (Intermolec F's)
****	Fri. Dec. 17	FINAL 12:00-3:00 PM	Final Exam covers the entire semester.	

[†] See following pages for details of topics covered and a detailed printout of online animation, assignment due dates*Note: The letter "F" indicates a Follow-Up Problem found within a chapter. "Principles of General Chemistry, Silberberg 2nd Ed

Textbook: "Principles of General Chemistry", Martin S. Silberberg, 2nd Ed

Chapter 1 Keys to the Study of Chemistry (p 1)	Chapter 7 Quantum Theory and Atomic Structure (p 214)
1.1 Some Fundamental Definitions 1.2 The Scientific Approach 1.3 Chemical Problem Solving 1.4 Measurement in Scientific Study 1.5 Uncertainty in Measurement: Significant Figures	7.1 The Nature of Light 7.2 Atomic Spectra 7.3 The Wave-Particle Duality of Matter and Energy 7.4 The Quantum-Mechanical Model of the Atom
Chapter 2 The Components of Matter (p 31)	Chapter 8 Electron Configuration, Chemical Periodicity (p 245)
2.1 Elements, Compounds, and Mixtures; An Atomic Overview 2.2 The Observations that led to an Atomic View of Matter 2.3 Dalton's Atomic Theory 2.4 The Observations that Led to the Nuclear Atom Model 2.5 The Atomic Theory Today 2.6 Elements: A first Look at the Periodic Table 2.7 Compounds: Introduction to Bonding 2.8 Compounds: Formulas, Names, and Masses 2.9 Classification of Mixtures	8.1 Development of the Periodic Table 8.2 Characteristics of Many-Electron Atoms 8.3 The Quantum-Mechanical Model and the Periodic Table 8.4 Trends in Three Key Atomic Properties 8.5 Atomic Structure and Chemical Reactivity
Chapter 3 Stoichiometry of Formulas and Equations (p 71)	Chapter 9 Models of Chemical Bonding (p 278)
3.1 The Mole 3.2 Determining the Formula of an Unknown Compound 3.3 Writing and Balancing Chemical Equations 3.4 Calculating Amounts of Reactant and Product 3.5 Fundamental of Solutions Stoichiometry	9.1 Atomic Properties and Chemical Bonds 9.2 The Ionic Bonding Model 9.3 The Covalent Bonding Model 9.4 Bond Energy and Chemical Change 9.5 Between the Extremes: Electronegativity and Bond Polarity
Chapter 4 Three Major Classes of Chemical Reactions (p 113)	Chapter 10 The Shapes of Molecules (p 305)
4.1 The Role of Water as a Solvent 4.2 Writing Equations for Aqueous Ionic Reactions 4.3 The Precipitation Reactions 4.4 Acid-Base Reactions 4.5 Oxidation-Reduction Reactions (Redox) 4.6 Elements in Redox Reactions	10.1 Depicting Molecules and Ions with Lewis Structures 10.2 Valence-Shell Electron-Pair Repulsion Theory, Molecular Shape 10.3 Molecular Shape and Molecular Polarity
Chapter 5 Gases and the Kinetic-Molecular Theory (p 145)	Chapter 11 Theories of Covalent Bonding (p 332)
5.1 An Overview of the Physical States of Matter 5.2 Gas Pressure and Its Measurement 5.3 The Gas Laws and Their Experimental Foundations 5.4 Further Applications of the Ideal Gas Law 5.5 The Ideal Gas Law and Reaction Stoichiometry 5.6 The Kinetic-Molecular Theory: A model for Gas Behavior 5.7 Real Gases: Deviations from Ideal Behavior	11.1 Valence Bond (VB) Theory and Orbital Hybridization 11.2 The Mode of Orbital Overlap and the Types of Covalent Bonds 11.3 Molecular Orbital Theory(MO) Theory and Electron Delocalization
Chapter 6 Thermochemistry (p 185)	Chapter 12 Intermolecular Forces (partial)
6.1 Forms of Energy and their Interconversion 6.2 Entalphy: Heats of Reaction and Chemical Change 6.3 Calorimetry: Laboratory Measurement of Heats of Reaction 6.4 Stoichiometry of Thermochemical Equations 6.5 Hess's Law of Heat Summation 6.6 Standard Heats of Reaction	12.6 Bonding in Solids (pp 388-391) 12.3 Types of Intermolecular Forces 12.4 Properties of the Liquid State 12.5 The Uniqueness of Water