

Beginning of new chapters are bolded/italicized; Pre-lecture videos (due before lecture!!) are in BLUE; Quizzes are in PURPLE

Week	Notes and quizzes	Tentative lecture topics; videos due <i>before</i> lecture		
		Monday	Wednesday	Friday
4 Sept	Classes begin Tues	-	Finish chapter 1 (1.1, 1.2, 1.3, 1.4)	Chapter 2: atoms, isotopes, composition of matter
11 Sept		Chapter 3: ions, balancing reactions, organization of the periodic table.	Chapter 4: ionization energy, light is a traveling wave (4.1, 4.2, 4.3)	Light, photon energy, spectroscopy (4.4, 4.5, 4.6)
18 Sept	Quiz #1 (M)	Starting to explain electrons: matter waves, standing waves (4.7)	Chapters 4 and 5: H atom family album (PDF), quantum numbers (n, l) Bohr model (4.8, 4.9)	Energy and size of hydrogen electron waves; Abs/emission (4.10, 4.11)
25 Sept		Single electron atomic ions Photoelectric effect More electron principles (4.12, 4.13, 5.1, 5.2)	Multi-electron atoms: principles, quantum numbers (m_l, m_s) (5.3, 5.4, 5.5)	Multi-electron atoms: shielding and Hund's rule (5.6)
2 Oct	Quiz #2 (M)	Electron configurations for second period elements	Periodic trends. Chapter 6: Ions and electron configurations; Ionic "bonds" (6.1, 6.2)	Energies of ionic interactions. Chapter 7: Lewis structures, formal charge (7.1, 7.2, 7.3)
9 Oct	No classes Mon. Tuesday is Monday schedule	Exceptions to the octet rule, resonance forms, bond order, (7.4)	Bond polarity. Chapter 8 in pre-lab (8.1, 8.2, 8.3). Chapter 9: Molecular orbital theory	MO theory of diatomic molecules of first period elements
16 Oct		Second row diatomic MOs (with π and π^*)	Second row diatomic MOs, polar bonds, molecules with >2 nuclei	Hybridization and bonding in molecules with more than 2 atoms (σ bonds)
23 Oct	Quiz #3 (M)	π bonds, molecules with delocalized electron clouds.	Chapter 11: moles, empirical formulas (11.1)	Combustion analysis, limiting reagents, yield (11.2, 11.3)
30 Oct		Dissolving ionic compounds Chapter 12: molarity Chapter 10: naming ionic compounds (10.1, 10.2, 12.1)	Solubility rules, precipitation reaction, hydrates, limiting reagents with ionic solutes. (10.2, 10.3, 10.5)	Molecular solutes, acids and bases, Titrations
6 Nov	Quiz #4 (M)	Chapter 13: gases, the ideal gas law, the molar gas constant, SATP Partial pressures (13.1, 13.2)	molar mass and gas density, limiting reagent with gases, Kinetic theory of gases	Kinetic molecular theory, root mean square speed of gases, diffusion and effusion (13.3)
13 Nov		Real gases Chapter 14: system and surroundings (14.1)	Heat, Calorimetry (14.2)	Work, the first law of thermodynamics (14.3)
20 Nov	Quiz #5 (M) Thanksgiving: no classes Wed-Fri	Enthalpy, molar enthalpy of reaction	-	-
27 Nov		Calorimetry, Enthalpy versus internal energy, q_v vs. q_p	Hess's Law and manipulating reactions, Enthalpy of formation (14.4)	Enthalpy of formation, Bond enthalpies (14.5)
4 Dec		Bond enthalpies (14.5)	Getting ΔH for reactions (a summary), microscopic origin of heat capacity	Finishing up last topics
11 Dec	Quiz #6 (M)	<i>Last lecture today, if necessary</i>	-	<i>Finals begin 12/15</i>

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Week	Notes and quizzes	Tentative lecture topics; videos due <i>before</i> lecture	
		Tuesday	Thursday
4 Sept	Classes begin Tues	Finish chapter 1 . Chapter 2: atoms, isotopes (1.1, 1.2, 1.3, 1.4)	Composition of matter, Chapter 3: ions, balancing reactions, organization of the periodic table
11 Sept		Chapter 4: ionization energy, light is a traveling wave, resonance, photon energy (4.1, 4.2, 4.3, 4.4)	Spectroscopy. Starting to explain electrons: matter waves, standing waves (4.5, 4.6, 4.7)
18 Sept	Quiz #1 (M)	Chapters 4 and 5: H atom family album (PDF), quantum numbers (n , l), Bohr model: energy and size of hydrogen electron waves. (4.8, 4.9)	Absorption/emission lines. Photoelectric effect and photoionization; single electron atomic ions (4.10, 4.11, 4.12, 4.13, 5.1)
25 Sept		Multi-electron atoms: principles, quantum numbers (m_l , m_s), shielding (5.2, 5.3, 5.4, 5.5)	Multi-electron atoms: Hund's rule, Electron configurations and periodic trends (5.6)
2 Oct	Quiz #2 (M)	Chapter 6: ions and their electron configurations, Ionic "bonds" (6.1, 6.2, 7.1)	Chapter 7: Lewis structures, Formal charge, resonance forms, bond order, exceptions to the octet rule, bond polarity (7.2, 7.3, 7.4)
9 Oct	No classes Mon. Tuesday is Monday schedule	No classes today	Chapter 8: molecular shape in pre-lab (8.1, 8.2, 8.3). Chapter 9: MO theory of diatomic molecules (first period), σ and σ^* MOs, bond order
16 Oct		Second row diatomic MOs (with π and π^*), polar bonds	Hybridization and bonding in molecules with more than 2 atoms (σ bonds)
23 Oct	Quiz #3 (M)	Bonding in molecules with more than 2 atoms (π bonds). Molecules with delocalized electron clouds. Chapter 11: moles (11.1)	Chapter 11: empirical formulas, combustion analysis, Limiting reagents (11.2, 11.3)
30 Oct		Chapter 10: naming ionic compounds, dissolving ionic compounds (10.1, 10.2) Chapter 12: molarity (12.1)	Solubility rules, precipitation reaction, hydrates, limiting reagents with ionic solutes (10.3) Molecular solutes, acids and bases, electrolyte strength, Titrations (10.2, 10.5)
6 Nov	Quiz #4 (M)	Chapter 13: gases, the ideal gas law, the molar gas constant, and SATP, Partial pressures, molar mass and gas density. (13.1, 13.2)	Limiting reagent problems with gases. Kinetic molecular theory, root mean square speed of gases, diffusion and effusion (13.3)
13 Nov		Real gases Chapter 14: system and surroundings, heat (14.1)	Heat and calorimetry, work, the first law of thermodynamics (14.2, 14.3)
20 Nov	Quiz #5 (M) Thanksgiving: no classes Wed-Fri	Enthalpy, molar enthalpy of reaction, Enthalpy versus internal energy	No classes today
27 Nov		Calorimetry, q_v vs. q_p , ΔU vs. ΔH	Hess's Law and manipulating reactions, Enthalpy of formation (14.4)
4 Dec		Bond enthalpies Getting ΔH for reactions (a summary) (14.5)	Calorimetry, microscopic origin of heat capacity
11 Dec	Quiz #6 (M)	Last lecture of CH101, if necessary	Finals begin 12/15

Important note about Chapter 10:

- We are skipping chapter 10. Much of the way the material in chapter 10 is presented is **very outdated** (at best), or even outright wrong. For example: total ionic equations are **totally incorrect** (see what we did there?). Instead, we will **only** discuss net ionic equations in this course.
- While this book is just the right level for CH101/102 and does most things great, chapter 10 is not good. Please **do not use the text of chapter 10** to guide your work.
- We will cover ***select topics*** (not all of them!!) related to chapter 10 as we work through chapters 11 and 12. Please **use the pre-lecture videos** for that material (videos 10.1 – 10.5) as well as the material we will present in class.
- We will make use of a *few* of the reference tables from Chapter 10, a few in-text examples, and some of the end-of-chapter homework problems.
- Note: our focus of chapter 10 will be on developing a microscopic understanding of the following types of reactions: dissolving solids, precipitation reactions, acid-base reactions, and reduction-oxidation reactions.
- Below are the details of the order we will cover chapters 10-12, including which homework problems go with each topic that we will cover.

Our path through Chapter 10 through 12 in McQuarrie:

1. Chapter 11: moles and chemical calculations (all sections of McQuarrie Chapter 11; pre-lecture videos 11.1-11.3)
End-of-chapter homework (chapter 11): 1, 2, 4, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 42, 44, 46, 50, 52, 53, 59, 60, 62, 68, 70, 72, 77, 78, 80, 86, 88, 90, 94
2. Dissolving and naming ionic compounds (pre-lecture videos 10.1 and 10.2; know Tables 10.1, 10.2, 10.3, and 10.4)
In-text Examples 10-1, 10-2, and 10-3
End-of-chapter homework problems (chapter 10): 2, 4, 6, 8, 10, 12, 14, 22, 24, 26, 28, 91
3. Solution concentration (pre-lecture video 12.1; McQuarrie sections 12-1, 12-2, and 12-3)
End-of-chapter homework problems (chapter 12): 4, 6, 8, 10, 12, 43, 45, 46, 52
4. Solubility of ionic compounds and precipitation reactions (pre-lecture video 10.3; know Table 10.9)
In-text Examples 10-13 and 10-15
End-of-chapter homework problems (chapter 10): 42, 44, 46, 48, 50, 52, 58 (note: only write NET IONIC equations!)
5. Hydrates (section 10-5)
In-text Examples 10-8
End-of-chapter homework problems (chapter 10): 30, 32
6. Limiting reagents with concentrations (McQuarrie sections 12-4, 12-5)
End-of-chapter homework problems (chapter 12): 18, 24, 28, 68, 69, 70, 71
7. Molecular solutes don't break up when dissolving (review pre-lecture video 10.2 again)
End-of-chapter homework problems (chapter 12): 14, 16, 39
8. Acids and bases (pre-lecture video 10.5)
9. Reduction and oxidation (pre-lecture video 10.4)
In-text Examples 10-18, 10-19
End-of-chapter homework problems (chapter 10): 62, 64
10. Titrations (McQuarrie sections 12-6, 12-7)
End-of-chapter homework problems (chapter 12): 29, 32, 36, 38, 72
11. Additional chapter 12 end-of-chapter homework problems: 54, 55, 60, 62, 64, 66, 80, 82, 85