

Topic	Comments	
Covalent Bonding and Shapes of Molecules		
1.1 Electronic Structure of Atoms	Concepts and principles and definitions you should know from General Chemistry	
1.2 Lewis Model of Bonding		
How To Draw Lewis Structures From Condensed Structural Formulas		
The Octet Rule		
1.3 Functional Groups		Know the ones presented in lectures
1.4 Bond Angles and Shapes of Molecules		Know the organic examples: alkanes; alkenes; alkynes
1.5 Polar and Nonpolar Molecules		Be able to classify both bonds & molecules as polar or nonpolar
1.6 Quantum or Wave Mechanics		Wave function; orbitals & shapes of orbitals (definitions)
1.7 The Molecular Orbital and Valence Bond Theories of Covalent Bonding		Hybridization-know all 3 types for C & the geometry & bond angles for each
1.8 Resonance		Know how to interconvert structures by moving pairs of e- and charges and double bonds
How To Draw Curved Arrows and Push Electrons	VSEPR & Resonance	
1.9 Molecular Orbitals for Delocalized Systems	In Alkanes, Alkenes & Alkynes	
1.10 Bond Lengths & Bond Strengths		
2 Alkanes and Cycloalkanes		
2.1 The Structure of Alkanes	C_nH_{2n+2} and sp^3 hybridization	
2.2 Constitutional Isomerism in Alkanes	definition and how to draw them	
2.3 Nomenclature of Alkanes & The IUPAC System	Basic IUPAC system	
2.4 Cycloalkanes	C_nH_{2n}	
2.5 Conformations of Alkanes and Cycloalkanes	Butane conformers; chair, boat, twist-boat	
2.6 Cis, Trans Isomerism in Cycloalkanes	definition and how to draw them	
How To Convert Planar Cyclohexanes to Chair Cyclohexanes	from 2D to 3D chairs	
3 Stereoisomerism and Chirality		
3.1 Chirality—The Handedness of Molecules	the concept & recognize chiral carbons	
3.2 Stereoisomerism	Definition and how to recognize it	
How To Draw Chiral Molecules	enantiomers	
3.3 Naming Chiral Centers—The R,S System	know rules of priority	
How To Assign R or S Configuration to a Chiral Center		
3.4 Acyclic Molecules with Two or More Chiral Centers	diastereomers; how to recognize them	
3.5 Cyclic Molecules with Two or More Chiral centers	use in cycloalkane systems	
3.6 Tying the terminology together		
Cutoff for Exam 1 Material		
3.7 Optical Activity—How Chirality Is Detected	know concept & definitions	

Topic	Comments
4 Acids and Bases	
4.1 Arrhenius Acids and Bases	definition and use in context
4.2 Brønsted-Lowry Acids and Bases	definition and use in context
4.3 Acid Dissociation Constants, pKa; Relative Strengths	know trends
4.4 The Position of Equilibrium in Acid-Base Reactions	know how to determine
4.5 Thermochemistry & Mechanisms of Acid-Base	Rxn coordinate diagrams; "pushing electrons"
4.6 Molecular Structure and Acidity	trends in size; delocalization effects
4.7 Lewis Acids and Bases	definition