Principles of Chemistry II

CHEM 1220

Spring 2025

Instructor:	Matthew Rowley	**Office Hours:**	Daily 10:00 am – 11:00 am
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Please include the course number in the subject line of all correspondence.

Tentative Schedule

Class will meet on Mondays, Tuesdays, Wednesdays, and Fridays from 2:00-2:50 in room SC 130 (Science Center)
For the best lecture experience, read the indicated textbook chapter *before* viewing each lecture

	Date	Topic	Chapter
Week 1	W, Jan. 8	Comparison: Gases, Liquids, and Solids	11.1
		Intermolecular Forces	11.2
	F, Jan. 10	Select Properties of Liquids	11.3
		Phase Changes	11.4
Week 2	M, Jan. 13	Vapor Pressure	11.5
		Phase Diagrams	11.6
	W, Jan. 15	Liquid Crystals	11.7
		Classification and Structure of Solids	12.1
	F, Jan. 17	Metallic Solics	12.2
		Metallic Bonding	12.3
Week 3	M, Jan. 20	**Martin Luther King Day - No Class!**	
	W, Jan. 22	Ionic Solids	12.4
		Molecular and Covalent Network Solids	12.5
	F, Jan. 24	Polymers	12.6
		Nanomaterials	12.7

	Date	Topic	Chapter
Week 4	M, Jan. 27	The Solution Process	13.1
		Saturated Solutions and Solubility	13.2
	W, Jan. 29	Factors Affecting Solubility	13.3
		Expressing Solution Concentration	13.4
	F, Jan. 31	Colligative Properties	13.5
		Colloids	13.6
Week 5	M, Feb. 3	Reaction Rates	14.1
		Rate Laws: Initial Rate Method	14.2
	W, Feb. 5	Integrated Rate Laws	14.3
	F, Feb. 7	Temperature and Rate: Arrhenius Equation	14.4
Week 6	M, Feb. 10	Reaction Mechanisms	14.5
		Catalysis	14.6
	W, Feb. 12	The Concept of Chemical Equilibrium	15.1
		The Equilibrium Constant	15.2
	F, Feb. 14	Using Equilibrium Constants	15.3
		Heterogeneous Equilibria	15.4
Week 7	M, Feb. 17	**President's Day - No Class!**	
	W, Feb. 19	Calculating Equilibrium Constants	15.5
		Some Applications of Equilibrium Constants	15.6
	F, Feb. 21	Le Châtelier's Principle	15.7
Week 8	M, Feb. 24	Classifications of Acids and Bases	16.1
		Conjugate Acid-Base Pairs	16.2
	W, Feb. 26	The Autoionization of Water	16.3
		The pH Scale	16.4
	F, Feb. 28	Strong Acids and Bases	16.5
		Weak Acids and Bases	16.6-7

	Date	Topic	Chapter
Week 9	M, Mar. 3	Relationships Between $K_a and K_b$	16.8
	W, Mar. 5	Acid-Base Properties of Salt Solutions	16.9
		Acid-Base Behavior and Chemical Structure	16.10
	F, Mar. 7	The Common-Ion Effect	17.1
		Buffers	17.2
Week 10	M, Mar. 10	**Spring Break - No Class!**	
	W, Mar. 12	**Spring Break - No Class!**	
	F, Mar. 14	**Spring Break - No Class!**	
Week 11	M, Mar. 17	Acid-Base Titrations	17.3
	W, Mar. 19	Solubility Equilibria	17.4
	F, Mar. 21	Factors that Affect Solubility	17.5
		Precipitation and Separation of Ions	17.6
Week 12	M, Mar. 24	Qualitative Analysis for Metallic Elements	17.7
		Chemistry of the Environment	18.1-5
	W, Mar. 26	Spontaneous Processes	19.1
		Entropy and the Second Law of Thermodynamics	19.2
	F, Mar. 28	The Molecular Interpretation Entropy and the Third Law	19.3
		Entropy Changes in Chemical Reactions	19.4
Week 13	M, Mar. 31	Gibbs Free Energy and Temperature	19.5-6
	W, Apr. 2	Free Energy and the Equilibrium Constant	19.7
	F, Apr. 4	Oxidation States and Redox Reactions	20.1
Week 14	M, Apr. 7	Balancing Redox Equations	20.2
	W, Apr. 9	Voltaic Cells	20.3
		Cell Potentials Under Standard Conditions	20.4
	F, Apr. 11	Free Energy and Redox Reactions	20.5

	Date	Topic	Chapter
Week 15	M, Apr. 14	Cell Potentials Under Nonstandard Conditions	20.6
	W, Apr. 16	Batteries and Fuel Cells	20.7
		Corrosion and Electrolysis	20.8-9
	F, Apr. 18	Radioactivity and Nuclear Equations	21.1
		Patterns of Nuclear Stability	21.2
Finals Week	R, Apr. 24	**Final Exam** 11:00-12:50 Bring a pencil and a scantron sheet	