

**RIDGECROFT SCHOOL
CHEMISTRY SCIENCE**

1. **CHEMISTRY (PUBLISHER: Prentice Hall), Wilbraham et al, ISBN 0-13-125812-5, 2005 Ed**
 2. **Reading Guide and Study Workbook: (PUBLISHER: Prentice Hall), Wilbraham et al, ISBN 0-13-125812-5, 2005 Ed**
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TOPICS/CONCEPTS	Chapter	Date for Class	CURRICULUM OBJECTIVES	Chemistry Text book Problems assigned	Dates for Lab Tues--Thurs	Chapters and Possible Chemistry Labs
INTRODUCTION TO CHEMISTRY	1	Aug 17, 20, 21, 22	1.01, 1.02, 1.03	34, 36, 41, 42, 45, 46, 47, 49, 50, 52, 53, 54, 56, 59, 60, 61, 62, 65, 66, 67, 70, 71, 73, 74, 78, 80, 81, 82	Aug 23	TEXTBOOK: Chapter 1 Lab: Observe and Infer
MATTER AND CHANGE	2	24, 27, 28, 29, 31	2.04, 5.03	35, 36, 37, 40, 43, 44, 46, 47, 48, 49, 52, 53, 54, 56, 57, 58, 60, 61, 62, 63, 66, 69, 70, 75, 76, 79, 81	Aug 30	TEXTBOOK: Chapter 2 Lab: Physical/chemical Change/reaction
SCIENTIFIC MEASUREMENT	3	Sept 4, 7, 10, 11, 12	1.01, 2.04	57, 58, 59, 60, 61, 62, 63, 67, 68, 70, 71, 72, 74, 75, 76, 77, 79, 80, 84, 86, 87, 89, 91, 92, 94, 95, 101, 105, 107	Sept 6	TEXTBOOK: Chapter 3 Lab: Mass, volume, density
ATOMIC STRUCTURE	4	14, 17, 18, 19, 21, 20	2.01, 2.02	34, 36, 39, 40, 45, 47, 48, 49, 51, 52, 54, 55, 59, 61, 63, 65, 70, 72, 73, 74, 81, 84, 86	Sept 13	TEXTBOOK: Chapter 4 Lab: Atomic structure
END OF FIRST GRADING PERIOD						
ELECTRONS IN ATOMS	5	Sept 21, 24, 25, 26, 28	2.01, 4.01	22, 23, 26, 27, 28, 29, 30, 31, 33, 34, 37, 39, 40, 41, 42, 43, 44, 45, 47, 48, 50, 52, 54, 55, 57, 58, 60, 65, 68, 69, 76	Sept 27	TEXTBOOK: Chapter 5 Lab: Flame test for metal Lab: Energies of electrons Lab: Spectrophotometer
THE PERIODIC TABLE	6	Oct 1, 2, 3, 5, 8	3.01	24, 25, 26, 27, 28, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 45, 46, 48, 49, 50, 51, 52, 53, 58, 61, 64, 65, 69	Oct 4	TEXTBOOK: Chapter 6 Lab: Periodic properties
IONIC AND METALLIC BONDING	7	9, 10, 16, 17, 18, 19	2.06	31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 45, 46, 47, 49, 52, 53, 64, 55, 56, 57, 58, 59, 62, 65, 67, 69, 70, 73, 76, 82	Oct 11	TEXTBOOK: Chapter 7 Lab: Crystal structures
COVALENT BONDING	8	22, 23, 24, 26, 29	2.07	39, 41, 42, 43, 45, 46, 49, 50, 52, 53, 54, 56, 57, 58, 59, 60, 63, 64, 65, 67, 68, 69, 74, 75	Oct 25	TEXTBOOK: Chapter 8 Lab: Molecular models
END OF SECOND GRADING PERIOD						
CHEMICAL NAMES AND FORMULAS	9	Oct 30, 31, Nov 2, 5, 6	2.03	42, 43, 46, 47, 51, 52, 53, 54, 55, 57, 58, 59, 60, 61, 64, 65, 66, 67, 68, 69, 70, 73, 74, 75, 77, 82, 84	Nov 1	TEXTBOOK: Chapter 9

CHEMICAL QUANTITIES	10	7, 9, 12, 13, 14	3.02	47, 50, 51, 52, 53, 54, 56, 58, 59, 60, 61, 62, 63, 64, 66, 67, 68, 69, 71, 74, 75, 76, 77, 78, 80, 83, 84, 87	Nov 8	TEXTBOOK: Chapter 10 Lab: Masses of equal volumes of gases Lab: Empirical formula determination
CHEMICAL REACTIONS	11	16, 19, 20, 21, 26, 27	5.01, 5.02, 5.03	36, 38, 40, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 54, 55, 56, 58, 59, 62, 64, 67, 70, 71	Nov 15	TEXTBOOK: Chapter 11 Lab: Chemical reactions Lab: Reactivity of metals Lab: Anions and cations in solutions Lab: Precipitation reactions Lab: Qualitative analysis
STOICHIOMETRY	12	28, 30, Dec 3, 4, 5, 6, 7	3.03	36, 37, 38, 40, 42, 45, 46, 47, 48, 49, 51, 52, 54, 60, 63, 64, 66	Nov 29 open lab	TEXTBOOK: Chapter 12 Lab: Qualitative analysis Lab: Balanced chemical equations
Review		Dec 10, 11, 12				Review
SEMESTER ASSESSMENT EXAM	1—12	Dec 13				
				END OF THIRD GRADING PERIOD		
STATES OF MATTER	13	Dec 14, Jan 4, 7, 8, 9, 11	2.08	27, 28, 29, 30, 33, 34, 35, 37, 39, 40, 41, 42, 43, 44, 45, 47, 48, 51, 52, 53, 57, 63, 64, 65, 66, 67, 70, 74	Jan 3, 10	TEXTBOOK: Chapter 13 Lab: Allotropic forms of sulfur Lab: changes of physical state
THE BEHAVIOR OF GASES	14	Jan 14, 15, 16, 18, 22, 23	2.05	39, 40, 41, 42, 43, 46, 47, 48, 50, 53, 54, 56, 57, 58, 60, 62, 69, 70, 71, 73, 74, 75, 76, 77, 79, 81, 82	Jan 17, 24	TEXTBOOK: Chapter 14 Lab: Pressure-volume relationships for gases Lab: Temperature-volume relationships for gases Lab: diffusion of gases
WATER AND AQUEOUS SYSTEMS	15	25, 28, 29, 30, Feb 1, 4		22, 24, 25, 26, 28, 32, 33, 34, 36, 38, 39, 40, 41, 44, 47, 48, 49, 56, 57, 59, 61, 63, 64, 66, 69, 73, 74, 76, 80	Jan 31	TEXTBOOK: Chapter 15 Lab: Distillation Lab: Solvent properties of water Lab: Water of hydration Lab: Electrolytes and nonelectrolytes
SOLUTIONS	16	5, 6, 8, 11, 12, 13	3.02	42, 44, 47, 48, 49, 51, 52, 53, 54, 55, 57, 58, 59, 61, 63, 64, 65, 66, 69, 70, 71, 73, 77, 78, 79, 80, 81, 85, 91	Feb 7, 14	TEXTBOOK: Chapter 16 Lab: Factors affecting solution formation Lab: Supersaturation Lab: Chromatography Lab: Freezing point

				END OF FORTH GRADING PERIOD		
THERMOCHEMISTRY	17	Feb 15, 18, 19, 20, 27	4.02	38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 50, 52, 53, 55, 56, 58, 59, 60, 61, 63, 65, 67, 71, 74, 78, 79, 82	Feb 21	TEXTBOOK: Chapter 17 Lab: Specific heat of a metal Lab: Heats of reaction
REACTION RATES AND EQUILIBRIUM	18	29, Mar 3, 4, 5, 7, 10	4.02, 4.03, 5.06	44, 45, 47, 49, 51, 52, 53, 55, 56, 57, 58, 59, 60, 61, 62, 63, 65, 66, 67, 68, 69, 70, 72, 75, 78, 79, 80, 82, 83, 87, 89	Feb 28, Mar 6	TEXTBOOK: Chapter 18 Lab: Factors affecting reaction rates Lab Clock reaction Lab: Disturbing equilibrium Lab: Solubility product constant
ACIDS, BASES, AND SALTS	19	11, 12, 14, 17, 18, 19	5.04	44, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 63, 64, 65, 66, 67, 69, 71, 72, 73, 74, 75, 76, 77, 79, 81, 82, 83, 85, 88, 93, 94	MAR 13, 20	TEXTBOOK: Chapter 19 Lab: Estimation of pH Lab: Reactions of acids Lab: Neutralization reactions Lab: Acid-base titrations Lab: Salt hydrolysis Lab: Buffers
OXIDATION-REDUCTION REACTIONS	20	Mar 21, April 1, 2, 4, 7, 8, 9, 11	5.05	26, 27, 28, 29, 30, 31, 33, 35, 36, 37, 38, 40, 43, 45, 46, 49, 53, 59, 60, 62, 63, 67, 70	April 3, 10	TEXTBOOK: Chapter 20 Lab: Oxidation-reduction reactions
				END OF SIXTH GRADING PERIOD		
ELECTROCHEMISTRY	21	14, 15, 16, 18, 21, 22		26, 27, 28, 29, 30, 31, 33, 34, 38, 41, 42, 48, 49, 50, 51, 52, 53, 57, 58, 59, 60, 61, 69, 74	April 17, 24	TEXTBOOK: Chapter 21 Lab: Corrosion Lab: Electrochemistry
HYDROCARBON COMPOUNDS	22	23, 25, May 5, 6, 7, 9		38, 39, 40, 41, 42, 43, 44, 46, 47, 49, 53, 55, 56, 58, 61, 63, 69, 73, 74	May 18	TEXTBOOK: Chapter 22 Lab: Hydrocarbons
FUNCTIONAL GROUPS	23	6, 16, 18, 20, 23		26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 38, 39, 40, 42, 43, 46, 50, 51, 52, 53	April 17, 19	TEXTBOOK: Chapter 23 Lab: Esters of carboxylic acids
Review		19, 20, 21				Review
SEMESTER ASSESSMENT EXAM	12—23	22				
				END OF SEVENTH GRADING PERIOD		

Rules for Make-Up Test, Homework and/or Labs
2006-2007

1. Students that miss a test should have a valid excuse. A valid excuse will be those circumstances where a student is away on a school-sponsored trip and/or sick. Persons that are sick will need to present to me a note from a parent or guardian or a medical doctor. Students not having a valid excuse for a test missed are subject to being assigned a zero.
2. Students with valid excuses should make up all test missed within 7 days or less. Excused students should then take the make-up test by 5:00 p.m. no later than one week from the day the test was administered. Persons not completing make-up test by designated date will be assigned a zero.
3. Any bonus points granted on any test (given during regular class hours) will not be awarded on any make-up test.
4. All make-up tests are to be taken at Chowan during office hours Monday-Friday. To do otherwise should be done by appointment only.
5. This same policy applies for all homework and/or lab experiments.
6. Dr. Faile's office hours for Ridgecroft students are as follows:

Office Hours (Please call for appointment)

Monday	Tuesday	Wednesday	Thursday	Friday
3-5		3-5		3-5

Grading System

Course Objectives

Each Grading Period		93—100 A	1. To provide students with a knowledge base in chemistry to enable them to function as informed citizens in society. 2. To provide students with a knowledge base in chemistry on which they can build if they choose a course of study in the sciences. 3. For students to experience data collecting and evaluating as a way of investigation.
Labs & Lab Test	40 %	85—92 B	
Chapter Test	60%	77—84 C	
Semester Grade		70—76 D	
Average of all Grading Period	80 %	0—69 F	
Assessment Exam (Covers three Grading Periods)	20 %		

Other Policies: "Thou shalt not steal." "Thou shalt not bear false witness against thy neighbor." "Thou shalt not covet thy neighbor's house,"....nor anything that is thy neighbor's. Chowan's Policy on Academic Cheating will be applicable in this course.

Statement on Academic Integrity Policy for Syllabus

All students should be familiar with and observe the Academic Integrity Policy, which can be found on pp. 86-87 of the 2006-2007 Chowan University *Catalog*. This policy forbids cheating, collusion, fabrication, and plagiarism. The penalty for academic cheating may range from an F in the course to suspension from the university.

Statement on Classroom Conduct Policy for Syllabus

All students are expected to behave in a mature and orderly manner. Disruptive an/or disorderly conduct will not be tolerated. The penalty for violating Chowan's Classroom Conduct Policy may range from an F in the course to suspension from the university. To review the policy, please see p. 86 of the 2006-2007 Chowan University *Catalog*.

Statement on Academic Grievance Policy for Syllabus

Should a student have a grievance that is academic in nature, the student should consult pp. 91-92 of the 2006-2007 Chowan University *Catalog*.

Statement on Disability Policy for Syllabus

It is the policy of Chowan University to accommodate students with disabilities. Any student with a disability who needs accommodation, for example in arrangements for examination, note-taking, or seating, should inform the instructor at the beginning of the course. To receive accommodations, students with disabilities must self-identify with the Learning Center, which is located in Camp Hall 121 (398-6294).

Office Hours (Please call for appointment)

Monday	Tuesday	Wednesday	Thursday	Friday
3-5		3-5		3-5

Class and Lab Hours

Monday	Tuesday	Wednesday	Thursday	Friday
7:50-8:40 a.m.	7:50-9:10 a.m.	7:50-8:40 a.m.	7:50-9:10 a.m.	7:50-8:40 a.m.

NC STANDARD COURSE OF STUDY

The Chemistry course encourages students to continue their investigations of the structure of matter along with chemical reactions and the conservation of matter and energy in those reactions. Inquiry is applied to the study of the composition, structure, properties and transformation of substances. The course focuses on basic chemical concepts and incorporates investigations to build understanding of these concepts. The unifying concepts and program strands provide a context for teaching content and process skill goals. All goals should focus on the unifying concepts:

- Systems, Order and Organization
- Evidence, Models, and Explanation
- Constancy, Change, and Measurement
- Evolution and Equilibrium
- Form and Function

COMPETENCY GOAL 1: THE LEARNER WILL DEVELOP ABILITIES NECESSARY TO DO AND UNDERSTAND SCIENTIFIC INQUIRY.

1.01 Design, conduct and analyze investigations to answer questions related to chemistry.

- Identify questions and suggest hypotheses.
- Identify variables.
- Use a control when appropriate.
- Select and use appropriate measurement tools.
- Collect and organize data in tables, charts and graphs.
- Analyze and interpret data.
- Explain observations.
- Make inferences and predictions.
- Explain the relationship between evidence and explanation.
- Identify how scientists share findings.

1.02 Analyze reports of scientific investigations from an informed scientifically-literate viewpoint including considerations of:

- Appropriate sample.
- Adequacy of experimental controls.
- Replication of findings.
- Alternative interpretations of the data

1.03 Analyze experimental designs with regard to safety and use safe procedures in laboratory investigations:

- Identify and avoid potential safety hazards given a scenario.
- Differentiate between safe and unsafe procedures.
- Use information from the MSDS (Material Safety Data Sheets) to assess chemical hazards.

COMPETENCY GOAL 2: THE LEARNER WILL BUILD AN UNDERSTANDING OF THE STRUCTURE AND PROPERTIES OF MATTER.

2.01 Analyze the historical development of the current atomic theory.

- Early contributions: Democritus and Dalton.
- The discovery of the electron: Thomson and Millikan.
- The discovery of the nucleus, proton and neutron: Rutherford and Chadwick.
- The Bohr model.
- The quantum mechanical model.

2.02 Examine the nature of atomic structure.

- Subatomic particles: protons, neutrons, and electrons.
- Mass number.
- Atomic number.
- Isotopes.

2.03 Apply the language and symbols of chemistry.

- Name compounds using the IUPAC conventions.
- Write formulas of simple compounds from their names.

2.04 Identify substances using their physical properties:

- Melting points.
- Boiling points.
- Density.
- Solubility.

2.05 Analyze the basic assumptions of kinetic molecular theory and its applications:

- Ideal Gas Equation.
- Combined Gas Law.
- Dalton's Law of Partial Pressures.

2.06 Assess bonding in metals and ionic compounds as related to chemical and physical properties.

2.07 Assess covalent bonding in molecular compounds as related to molecular geometry and chemical and physical properties.

- Molecular.
- Macromolecular.
- Hydrogen bonding and other intermolecular forces (dipole/dipole interaction, dispersion).
- VSEPR theory.

2.08 Assess the dynamics of physical equilibria.

- Interpret phase diagrams.
- Factors that affect phase changes.

COMPETENCY GOAL 3: THE LEARNER WILL BUILD AN UNDERSTANDING OF REGULARITIES IN CHEMISTRY.

3.01 Analyze periodic trends in chemical properties and use the periodic table to predict properties of elements.

Groups (families).

- Periods.
- Representative elements (main group) and transition elements.

- Electron configuration and energy levels.
- Ionization energy.
- Atomic and ionic radii.
- Electronegativity.

3.02 Apply the mole concept, Avogadro's number and conversion factors to chemical calculations.

- Particles to moles.
- Mass to moles.
- Volume of a gas to moles.
- Molarity of solutions.
- Empirical and molecular formula.
- Percent composition.

3.03 Calculate quantitative relationships in chemical reactions (stoichiometry).

- Moles of each species in a reaction.
- Mass of each species in a reaction.
- Volumes of gaseous species in a reaction.

COMPETENCY GOAL 4: THE LEARNER WILL BUILD AN UNDERSTANDING OF ENERGY CHANGES IN CHEMISTRY.

4.01 Analyze the Bohr model in terms of electron energies in the hydrogen atom.

- The spectrum of electromagnetic energy.
- Emission and absorption of electromagnetic energy as electrons change energy levels.

4.02 Analyze the law of conservation of energy, energy transformation, and various forms of energy involved in chemical and physical processes.

- Differentiate between heat and temperature.
- Analyze heating and cooling curves.
- Calorimetry, heat of fusion and heat of vaporization calculations.
- Endothermic and exothermic processes including interpretation of potential energy.
- Diagrams (energy vs reaction pathway), enthalpy and activation energy.

4.03 Analyze the relationship between entropy and disorder in the universe.

4.04 Analyze nuclear energy.

- Radioactivity: characteristics of alpha, beta and gamma radiation.
- Decay equations for alpha and beta emission.
- Half-life.
- Fission and fusion.

COMPETENCY GOAL 5: THE LEARNER WILL DEVELOP AN UNDERSTANDING OF CHEMICAL REACTIONS.

5.01 Evaluate various types of chemical reactions.

- Analyze reactions by types: single replacement, double replacement (including acid-base neutralization), decomposition, synthesis, and combustion including simple hydrocarbons.
- Predict products.

5.02 Evaluate the Law of Conservation of Matter.

- Write and balance formulas and equations.
- Write net ionic equations.

5.03 Identify and predict the indicators of chemical change.

- Formation of a precipitate.
- Evolution of a gas.
- Color changes.

- Absorption or release of heat.

5.04 Identify the physical and chemical behaviors of acids and bases.

- General properties of acids and bases.
- Concentration and dilution of acids and bases.
- Ionization and the degree of dissociation (strengths) of acids and bases.
- Indicators.
- Acid-base titration.
- pH and pOH.

5.05 Analyze oxidation/reduction reactions with regard to the transfer of electrons.

- Assign oxidation numbers to elements in REDOX reactions
- Identify the elements oxidized and reduced.
- Write simple half reactions.
- Assess the practical applications of oxidation and reduction reactions.

5.06 Assess the factors that affect the rates of chemical reactions.

- The nature of the reactants.
- Temperature.
- Concentration.
- Surface area.
- Catalyst.