

REEDLEY COLLEGE
CHEMISTRY 10 COURSE SYLLABUS FALL 2015

REQUIRED ITEMS: TEXT: Basic Chemistry 2015 by <i>Zumdahl</i> ISBN 978-1-2854-5314-9 “Lecture Handouts Chemistry 10,” by R. Culp These are available on blackboard. Print and bring these to lecture. “Calculator” (TI-30xa): Programmable calculators are not allowed during exams. The TI-30xa is suggested for the course. <u>Directions for this calculator are written in the lecture notes.</u> SCANTRON FORM # 882-E (FIVE ARE NEEDED) LAB TEXT: (POSTED ON BLACKBOARD) ASSORTED STUDY GUIDES AND HANDOUTS (posted on Blackboard or in the lab manual; print as needed.)	INSTRUCTOR: R. C. CULP LECTURE AND LOCATION: SECTION: 56104 FRIDAY 0900 -11:50 AM PHY 82 12:00 -02:50 PM PHY-82 CONTACT INFORMATION: <ul style="list-style-type: none">• E-MAIL: robb.culp@reedleycollege.edu• PHONE: No Message Phone At Reedley OFFICE HOURS: Our class is a mixture of lecture and laboratory. Please bring your questions to class. LAB. SUPPLIES: Shoes, approved safety goggles or glasses, additionally pen, pencil, straight edge (ruler), and lab coat.
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RECOMMENDED: This course makes extensive use of downloadable PowerPoint files, video and electronic documents. If you do not have a computer, you will need access to one.

COURSE DESCRIPTION: This is a one-semester elementary class for students who have never taken high school chemistry. The course will give students a basic background in matter, energy, chemical reactions, measurements, formula writing, nomenclature, chemical calculations, gas laws, bonding, solutions, net-ionic equations, acid-base theory, pH, oxidation-reduction reactions and equilibrium. Recommended for applied science and non-science majors, or for students preparing to take Chemistry 1A.

ADVISORIES: English 1A and Mathematics 103

DROP DATE: The last day to drop WITHOUT an (A-F) letter grade is Friday, October 16, 2015. After that date the instructor is required to assign a letter grade that will appear on your transcript. If you plan to drop the class, you should do so yourself. After the third week do not depend on your instructor to drop you for non-attendance. Students with a failing grade or a poor record of attendance after October 9, 2015 should discuss their status with the instructor before the October 16th drop date.

SUCCESS IN CHEMISTRY: Success in this course and in college in general requires productive effort. Most successful college students develop an approach to learning that best utilizes their time and allows them to develop an understanding allows them to be successful on exams. It is difficult to be successful without working at it. It is also difficult to be successful without developing a system of regular study. You will need to study at least 6 hours each week outside of the classroom. This time includes reading, studying, and doing homework assignments. Preparing labs will require additional time. It is essential that you listen effectively and that you take good lecture notes in class. **Read the assigned text chapter or laboratory before coming to class and be prepared to ask questions** during the lecture and laboratory. Chemistry is a cumulative subject; later topics require a good understanding of this earlier material. **Plan your special events carefully, students who fall behind rarely finish successfully.**

ATTENDANCE: Lecture and laboratory attendance is taken at the start of each lecture and laboratory meeting and occasionally at the end of class. You may be dropped if you fail to attend for two consecutive weeks prior to the 9th week. If you do miss a lecture, download the lecture slides that were covered that day from blackboard. Together attendance and homework count as class participation for the purposes of your grade.

HOMEWORK: Homework is assigned at each lecture. You should do the homework as soon as possible and come to the next lecture/laboratory period prepared to ask questions. It is almost impossible to learn chemistry without doing homework. Homework is collected at the START each exam; do NOT wait until the night before the exam to do all the homework. Homework is not graded but will be checked for completeness. Lists of answers without work are not classified as complete. A completed homework set will receive a 10 of 10 pt score. Sets that are incomplete will receive a grade of 0-9 of 10 pts possible. **No late homework will be accepted.** Each assignment is given a number; **you must write the assignment number on your paper to receive credit.**

MEMORIZATION QUIZ: On the first day of class I will provide a periodic table of the elements with element names and a list of common ions. We will also define the units of the metric system. We will specifically identify important information that you should memorize for the course. During the second and third week of the semester I will give you a quiz which requires that the following information be memorized. It will be worth 100 points (equivalent to one lab) in the lab grade. You will have two chances to pass with 80% or better,

otherwise a zero grade is scored for the assignment. If you score 80% or better on either quiz the assignment scores 100 points. The quiz will be given at the beginning of class so if you are late you will have less time or may miss the quiz entirely. If you arrive late, I will ask you to wait for the class to complete the quiz, before taking your seat.

Memorize the following (for a detailed list, see Blackboard):

- The names, symbols and spelling of the elements from the four rows of the periodic table.
- The names, abbreviations and values of the metric prefixes kilo, centi, milli, and micro (see conversion card handout)
- The names, abbreviations and quantities measured by the metric units gram, meter, and liter see conversion card handout)
- The names, formulas and charges for the polyatomic ions: sulfate, phosphate, carbonate, nitrate, hydroxide.

The material on the quiz (5 versions) will be random but will only contain the material listed above. You will have 5 minutes to complete the quiz. Expect 10-20 multiple choice questions of the following type:

- (1) What is the name of the element with the symbol (2) What is the formula of the sulfate ion?
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|----------------------|-----------------------|
| A. Fluorine | A. SO_4 |
| B. Phosphorus | B. S^{2-} |
| C. Fluorine | C. SO^- |
| D. Iron | D. SO_4^{2-} |
| E. None of the above | E. None of the above |

Homework: A small set of homework is assigned for each chapter. Exams are primarily based on lecture, homework is intended to help you check your understanding of lecture concepts. The due date for homework is normally the week following the completion of the chapter lecture. Late homework is not accepted. The lowest two nonzero scores for the semester will be dropped (zero scores are not dropped). Please attach your completed in class problems as the first page of your homework assignment.

EXAMS: There are four scheduled (~40 question) midterm exams and a cumulative two-hour (50 questions) final exam. The midterm exams are given during the first 90 minutes of the class period and should take most students 60 minutes to complete. There are NO MAKEUPS for missed exams. I'M SORRY BUT THERE ARE NO EXCEPTIONS! The required two-hour final exam will cover new material and cumulative material. Your score on the cumulative portion of the final exam can be used to replace a low score on a previous exam.

LABORATORY: Lab work will follow as closely as possible the material discussed in the lectures. There is no published lab manual for this course. All the lab assignments and experiments are available on Blackboard. It is your responsibility to print the assigned experiment and bring it with you to class. Pre-laboratory assignments are due at the beginning of the lab period or before you begin an experiment. Lab reports are due on the following Friday. You may not leave lab early unless you have completed and turned in the lab assignment. Late labs will be penalized 30% per week late. No labs will be accepted after it has been graded and returned to students in class. **No Lab unless the prelab was turned in on the day the lab was done.** The lowest nonzero laboratory report score of the semester will be dropped. Any missed labs will receive a grade of zero. It is not possible to make up missed labs and these are not dropped.

ELECTRONIC DEVICES: Please silence your cell phone during class and refrain from texting or surfing the internet. Please put your headphones and music players away during class. You **may NOT** use the calculator on your cell phone during an exam. If your phone is out during an exam it will not be counted. **CALCULATORS:** If I loan you a calculator for use during an exam there is a 5% deduction on the exam score. If there is no calculator available you will need to do the exam without one. Do not plan to share a calculator

GRADES:

The grading scale will be based on a straight percentage:

- A = 100% - 90%
- B = 89% - 80%
- C = 79% - 70%
- D = 69% - 60%
- F = 59% - 0%

The final grade will be calculated as follows:

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|-------------------------|-----|
| Average of exams | 44% |
| Final Exam | 22% |
| Average of Study guides | 9% |
| Lab grade | 20% |
| Participation: | 5% |

The final percent score may be adjusted up by as much as 2 % for students that perform exceptionally well on the final and in laboratory. No adjusted percentage will exceed the final exam score.

BLACKBOARD: You are strongly encouraged to make use of Blackboard. It is like a virtual blackboard on the internet where I can post announcements. You can find the course syllabus, lecture and lab schedules, lecture handouts, homework assignments, study guides and laboratory handouts and experiments. Lecture Slides will be posted in a full-size, color version and as a black & white, 3 slides/page handout version. Some students may find it helpful to print the handout version to bring to class. Please see me if you need help with Blackboard.

ACADEMIC DISHONESTY: Students at Reedley College are entitled to the best education that the college can make available to them, and they, their instructors, and their fellow students share the responsibility to ensure that this education is honestly attained. Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college, each student is expected to exert an entirely honest effort in all academic endeavors. Academic dishonesty in any form is a very serious offense and will incur serious consequences. For more information please college policy on cheating and plagiarism see the Reedley College catalog.

ACCOMMODATIONS: If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

NON-DISCRIMINATION STATEMENT: The State Center Community College District does not discriminate nor harass on the basis of race, color, national origin, gender, sexual orientation, disability, or age in any of its policies, procedures, or practices, nor does it tolerate sexual harassment.

I. COURSE OUTCOMES: The college specifies a list of specific skills that students should demonstrate at the end of this course. These have broad application to preparing students for Chemistry 3A and Chemistry 1A.

- Upon completion of this course, students will be able to:
 - A. Demonstrate a working knowledge of the periodic table in such ways as deriving inorganic chemical formulas and balanced chemical equations.
 - B. Write the name of inorganic and molecular compounds from the formulas.
 - C. Use dimensional analysis and stoichiometry to solve for an unknown parameter of density, volume, mass, pressure, temperature, molar mass and concentration.
 - D. Apply the definition of acids and bases and explain the concept of pH.
 - E. Apply basic safety procedures in the chemical laboratory and demonstrate laboratory skills in the use of analytical balances, following experimental procedures and the proper handling of glassware.

II. COURSE OBJECTIVES: The college specifies a list of specific skills that students should demonstrate as they progress through their course of study. While this is not a complete list of what is on your exams, your exams will include all of these concepts at some point during the course.

- **In the process of completing this course, students will:**
 - A. Use the periodic table to predict properties of the elements and to obtain information for chemical calculations.
 - B. Identify molecular and ionic compounds and the specific bonding types that occur in these compounds.
 - C. Set up and balance chemical equations.
 - D. Complete mole and mass calculations using the stoichiometry in balanced equations.
 - E. Identify molecular and ionic compounds.
 - F. Demonstrate the use of the ideal gas law and combined gas law to calculate quantities for all the variables in an equation, such as pressure, volume, moles and temperature.
 - G. Identify the names and symbols of the elements on the periodic table and use these to derive inorganic chemical formulas and balanced chemical equations.
 - H. Write the names of ionic and molecular compounds given the chemical formula.
 - I. Use dimensional analysis to convert from the English to the metric system for measurements that are common to chemistry such as mass, volume, formula weights, density, linear measurements and temperature.
 - J. Balance chemical equations, and use both the molecular and net ionic forms of the equation and stoichiometry to predict quantities of products from given reactant amounts.
 - K. Describe covalently bonded compounds using Lewis structures.
 - L. Apply the definition of acids and bases to the understanding of pH and acid related problems.
 - M. Demonstrate safe use of the laboratory equipment, such as an analytical balance, glassware and thermometers, while conducting laboratory experiments.

Week:	Date:	Chapter:	Lecture Topics and Lab Assignments
1	8/21	1.1-1.4 2.1-2.3	Lecture: (1) Scientific Method, (2) Metric System of Units, (3) Standard units of Measurement, (4) Required Memorization.
			Experiment #1: Introduction to the Chemistry Experiment: (1) Safety, (2) Syllabus, Basic Math Handout (Due 8/28)
2	8/28	2.4-2.8 Mem. Quiz	Lecture: (1) Measurement Uncertainty, (2) Rules of Significant Figures, (3) Rounding For Multiplication and Division, (4) Density Calculations.
			Experiment #2: Laboratory Glassware, Balances and Density Measurement (Due 9/4)
3	9/4 Last day to Add.	3.1-3.5 Mem. Quiz	Lecture (Matter) (1) Solids, Liquids and Gases, (2) Properties and Changes, (3) Elements (monatomic & polyatomic) and Compounds, (4) Introduction to the Periodic Table, (5) Pure Substances and Mixtures.
			Experiment #3: Separation of a Fe, Sand and NaCl Mixture and Calculation of a Percent by Mass Composition
4	9/11	4.1-4.10	Lecture (Atoms, Isotopes and Ions) (1) What is an Atom? (2) What is an Element? (3) What is an Isotope? (4) What is an Ion. Atoms, Ions and Isotopes Handout (Due in Lab 9/18)
			Experiment #4: Percent Composition of an Antifreeze Solution (Graphing) (Due 9/18)
5	9/18	5.1-5.7	Lecture (How to Name Chemical Compounds): (1) Identification of Compounds by Type, (2) Formulas of Ionic Compounds, (3) Ionic Formulas with Polyatomic Ions, (4) Naming Type I Compounds, (5) Naming Type II Compounds, (6) Naming Type III Compounds, (7) Naming Acids.
			Experiment: Exam 1 (Ch. 1.1-4.10) First activity of the day (9-10:30 AM). Worksheet 1: Combined Lecture and Laboratory Activity. Bring Your Lecture Text to Class.
6	9/25	6.1-3 Posted Notes	Lecture (Balancing Chemical Reactions): (1) Exam 1 Recap, (2) Defining a Chemical Change, (2) The Components of a Chemical Reaction Equations, (3) Balancing Chemical Reactions.
			Experiment #5: A Survey of Five Chemical Reactions
7	10/2	7.1-7.6	Lecture (Aqueous Chemical Reactions): (1) Reactions that Produce Solids, Gases, and Water, (3) Combustion Reactions, (4) Oxidation-Reduction Reactions
			Experiment #6: Atomic Weight of Aluminum Rxn of Al and CuSO₄
8	10/9	8.1-8.9	Lecture (Chemical Composition): (1) Introduction to the Mole Unit, (2) The Mole Unit as a Measure of Mass, (3) Mole Unit as a Number, (4) Percent by Mass Composition, (5) Calculation of Empirical Formulas, (6) Calculation of Molecular Formulas
			Experiment #7: Estimating the Size of a Mole (<i>Using Split Peas</i>)
9	10/16 Last Day to Drop (W)	9.1-9.6	Lecture (Chemical Quantities): (1) Using a Chemical Reaction for Mole Conversions, (2) Calculating the Yield For a Mixture of Two Reactants, (3) Calculating Percent Yield.
			Laboratory: Exam 3 (Ch. 5-8.9) First activity of the day (9-10:30 AM). Worksheet 2: Combined Lecture and Laboratory Activity.

10	10/23	10.1-10.5	Lecture (Energy): (1) Energy, Heat and Work, (2) Exothermic and Endothermic Processes, (3) Heat (q) Calculations. (4) Specific Heat Capacity, (5) Heat of Reaction.
			Experiment #8: Determination of a Limiting Reactant, Stoichiometric Yield and Percent Yield For the Reaction of Copper Sulfate and Aluminum Metal.
11	10/30	11.1-11.7, 11.9	Lecture (Modern Atomic Theory): (1) The Hydrogen Atom, (2) Rutherford's Atom, (3) Electromagnetic Spectrum (light), (4) Electron Configurations and Valance Electrons , (5) Periodic Table and Valance Electrons, (6) Formation of Ions (Octet Rule).
			Laboratory: Worksheet 3: Classification of the Elements and Atomic Spectra
12	11/6	12	Lecture (Chemical Bonding): (1) Ionic and Covalent Chemical Bonding, (2) Electronegativity, (3) Types of Chemical Bonds, (4) Lewis Structures of Molecules Based on the Octet Rule
			Laboratory: Exam 3 (Ch.9-11) First activity of the day (9-10:30 AM). Worksheet 4: Combined Lecture and Laboratory Activity (Lewis Diagrams).
13	11/13	13	Lecture (Properties of Gases): (1) Pressure, (2) Empirical Gas Law Relationships, (3) Ideal Gas Law, (4) Dalton's Law, (5) Kinetic Molecular Theory of Gases.
			Experiment #13: Molar Mass of a Volatile Liquid
14	11/20	14	Lecture (Properties of Pure Liquids and Solids): (1) Heat (q) Changes in State, (2) Intermolecular Forces, (3) Hydrogen Bonding, (4) Bonding and Types of Solids
			Experiment #14: Paper Chromatography of Ink, Is Black Ink Really Black?
15	11/27	-----	Thanksgiving Holiday (No Class)
16	12/4	15	Lecture (Properties of Solutions and Units of Concentration): (1) Solubility, (2) Mass Percent, (3) Definition of Molarity, (4) Moles From Molarity and Volume, (5) Molarity by Dilution
			Experiment #15: Titration of Vinegar (Mass Percent and Molarity)
17	12/11	16	Lecture (Acids and Bases): (1) Acid Base Definitions, (2) Relative Strength of Acids and Bases, (3) Water and pH Scale, (4) pH and pOH Calculations, (5) Acidic and Basic Solutions.
			Laboratory: Exam 4 (Ch.12-15) Worksheet 4: First activity of the day (9-10:30 AM).
18	12/18		Final Exam (Includes Chapter 16) The Final Exam Breaks Down as Follows: <ul style="list-style-type: none"> • 9 Questions Based Chapter 16 • 5 Questions Based on Course Outcomes (listed pg. 3) • 36 Questions Based on Exams 1-4 <i>Please Bring a Scantron 882 E, pencil, eraser and calculator for your use during the exam. No Calculators are Provided.</i>

Midterm Exams: Each exam will draw questions equally from each chapter covered. Exam questions are based on, but are not identical to, homework questions, laboratory assignments, Lecture PowerPoints, and Study Guides. All questions will have only one correct answer. In the event that a question contains an error or has no single correct answer, it will be dropped from the exam.

Midterm and Final Grades: Please keep your returned exams for final exam review. A grade report is provided to each student with the return of each exam. The grade report will detail your scores for each item graded. Please check the report against your records. At the end of the semester final grades are posted to Web-Advisor by 5PM on 12/18. If you want to discuss your final grade or see it I will have an office hour (12/18/2015) in the classroom (PHY 82) from 12:30-1:00 PM.