

CHEM 3A: Introductory General Chemistry

Summer 2019 Sections 51037 and 51039

Section 51037 Lab MTWTh (8:00-10:05) in PHY 82 and Lec (10:15-12:20) in PHY 76

Section 51039 Lab MTWTh (12:30-2:35) in PHY 82 and Lec (10:15-12:20) in PHY 76

Instructor: V. Cornel

Contact info: e-mail veronica.cornel@reedleycollege.edu using “Chem3A” in subject line, or 638-3641 ext 3449

Webpage: All notes, labs, grades etc. will be posted on Canvas. Both classes will be combined so please accept the invitation to join the CHEM3A-51037 section on Canvas.

Course Objectives: Chemistry 3A is an elementary survey course in chemistry including lab work. It is designed to give the student a chemistry background for a wide variety of careers including forestry, nutrition, nursing, physical therapy, teaching and other biological and health related fields.

Course Prerequisite: Math 103/High School Algebra II Students will need to be familiar with basic algebra before taking this course as there is a lot of math involved.

Course Advisories: ENGL 1A, CHEM10 or high school chemistry

Text and Materials:

1. Optional but Highly Recommended: Nivaldo J. Tro: “Introductory Chemistry” **3rd, 4th, 5th or 6th** Edition. The Mastering Chemistry CD is not needed.

2. Download fill-in notes and the labs off Canvas

You will need safety glasses (\$5 at hardware store or you may borrow some from me), a labcoat (which you can borrow from me), closed toe shoes, and a calculator with “exp” (or “EE”) and “log” keys (\$12 at Walmart), but not a programmable calculator.

Lecture Notes: The ability to listen carefully and to take good lecture notes in an essential college skill. Students should print out the fill-in notes, homework and lab assignments off my Canvas website prior to coming to class. Studies have shown that 90% of the lecture material is retained if you review the lecture within 24 hours after class and do your homework. If you wait until the next exam you will only retain 35%.

Homework: Homework will be assigned every lecture. It is essential to your success in this class that you do all the assigned homework and read the relevant sections in your Textbook. All homework will be collected at the beginning of the following lecture and selected problems graded. This is to ensure that you work consistently and can apply what you learn to problems. There will be no make-up homework assignments, but I will drop the lowest two homework assignments. Do not just copy somebody else’s homework or you will not be able to do the problems for yourself in the exams. You can ask another student or tutor to help you start some problems, but you need to work them out for yourself. Even if you get all the problems wrong, you will still get 70% for the assignment for attempting all the problems yourself and showing all your work. You will learn where you are going wrong when I go over the homework. This summer I will not accept late homework. Absence is not an excuse for not doing your homework as you can send it in with another student, or count those assignments as ones you drop. If you leave the class or are disruptive while I go over homework, I will also deduct points. You will need to type or write out the homework questions as well as the answers so you can study your homework. You can also do the corresponding odd number problems for extra practice or to check you are doing the questions correctly, and check the answers to the odd number problems at the back of the book.

Last day to add class, or drop class to avoid a "W": Friday, June 28

Drop Date: The last day to drop this class is Friday, July 15. After this date a grade will be assigned.

Final Exam Date: **Thursday, Aug 1 (10:15 to 12:20) in PHY76** No lab or tutorial that day.

Attendance: Attendance in lecture and lab is mandatory. As an incentive to attend lectures, an additional two homework assignments will be dropped at the end of the course if a student attends 90% of the lectures. The student will be dropped automatically if she/he misses the first day of class, without contacting the instructor. If a student misses more than 25% of the lectures/labs, without contacting the instructor with a valid excuse, they will also be dropped. If you miss a lecture you need to read and summarize the chapter in the textbook **before** meeting with the instructor to discuss any problems. The homework will be on the internet notes so that you can do the homework even if you missed the lecture. If you ask me for a make-up exam you have to provide a written, verifiable excuse (e.g. from a doctor, not just your boss). The make-up exam will be on the following exam day, during the tutorials. e.g. if you miss Exam 1 you will do the make-up on July 3 (the same day you do Exam 2). If you miss a second exam you will get zero for that exam.

Grading and Exams: There will be 6 exams covering the material of previous lectures. These 6 exams will be equally weighted and count 65% all together (13% each).

Laboratory (25%):	Lab reports 12.5%
	Lab Quizzes 12.5%
Lecture Material (75%):	Exams 65%
	Homework 10%

The grading scale to be used is **A** 90-100%, **B** 80-89%, **C** 70-79%, **D** 60-69%, **F** 0-59%

Please be aware of the following rules:

- Tardiness, cell-phone use, leaving early, and sleeping during lecture is considered disruptive behavior and will result in a partial or full absence being recorded. Students will need to sign the sign-in sheet within the first 10 minutes of class.
- Fraudulent behavior during exams is graded with a (0) zero.
- No homework may be handed in late. No alternative homework will be given. I will drop the lowest four homework assignments though.
- No extra credit will be given. You need to work consistently from the beginning.
- Please turn your cell phones onto "silent buzzer" mode during lectures so as not to disturb the class. No cell phones or i-pods will be allowed during exams.
- Please use the restroom before coming to an exam. Nobody will be allowed to go to the restroom during an exam.

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 the Disabled Student Services as soon as possible.

Student Learning Outcomes:

Upon completion of this course, students will be able to:

- A. Use dimensional analysis to solve for an unknown parameter of density, volume, mass, pressure, temperature, molar mass, concentration, or an empirical formula.
- B. Construct and balance a chemical reaction and use the reaction to predict stoichiometric quantities.
- C. Explain concepts from the periodic table and use the periodic table to solve chemical problems.
- D. Describe acid-base reactions and how to calculate pH.
- E. Name and draw Lewis diagrams of inorganic and molecular compounds from the formula and vice versa.
- F. Safely conduct laboratory experiments implementing concepts and principles learned in lecture.

Course Objectives:

Upon completion of this course, students will be able to:

- A. demonstrate an appreciation for the impact of chemistry on modern society and the relationship between chemistry and other disciplines including agriculture, the medical field, and industry;
- B. classify types of matter, recognize physical properties and chemical properties, and a general understanding of the Law of Conservation of Mass and the Law of Conservation of Energy;
- C. perform unit conversions using the correct significant figures; between the English and metric systems, temperatures in different units, density, energy, and with SI units;
- D. use the periodic table to predict physical and chemical properties of elements and calculate molar masses of compounds and molecules;
- E. recognize the electromagnetic spectrum and have a basic understanding of the quantum mechanical model of the atom;
- F. demonstrate the ability to name inorganic compounds given their formulas, and write formulas given names;
- G. distinguish and identify metals, non-metals, metalloids, and the elements of alkali metals, alkaline earth metals, halogens, noble gases, transition metals, and elements of the lanthanide and actinide;
- H. distinguish and identify between different types of intramolecular and intermolecular forces of attraction present in various substances based on chemical formulas and structures;
- I. write Lewis Electron-Dot Formulas and identify the shape using VSEPR method;
- J. write and balance chemical equations, and use these equations along with stoichiometry and the mole concept to convert quantities (e.g. grams or moles) of a given substance into quantities of an unknown substance;
- K. calculate, empirical formulas, and percentage composition given the appropriate data;
- L. distinguish and balance chemical equations of different types of reactions;
- M. perform calculations involving a limiting reagent and determining the percent yield;
- N. predict the physical behavior of gases to pressure, temperature, and volume changes;
- O. solve simple mathematical problems involving formula calculations related to gas laws;
- P. use gas laws and stoichiometry to calculate quantities (e.g. moles, volume, grams) of gas produced or consumed during a reaction;
- Q. calculate various parameters of solutions including molarity, dilution techniques, percentage concentration, and density.

- R. construct heating and cooling curves;
- S. describe state and energy changes accompanying heating and cooling curves;
- T. apply the principles of equilibrium in reversible reactions, saturated solutions, solutions of weak electrolytes and solutions of gases in solving related problems;
- U. use solution properties and stoichiometry to calculate quantities (e.g. moles, volume, grams) produced or consumed during a reaction;
- V. describe colligative properties of solutions (e.g. boiling point elevation, freezing point depression, and osmotic pressure);
- W. define and identify acids and bases and be able to perform math calculations involving the pH;
- X. determine the nature and applications for electron exchange reactions;
- Y. understand the structure of the atomic nucleus;
- Z. understand the fundamental types of nuclear radiation and the effects they have on biological systems
- AA. and demonstrate laboratory skills which include operating an analytical balance; calibrating and/or use fundamental lab equipment such as a thermometer, barometer, buret, pipette; recognizing use and limitations of laboratory glassware; recording and reporting observations; using error analysis techniques to evaluate certainty of data; use safety precautions and general laboratory procedures.

CHEM 3A Summer 2019

	Date	Lecture Topic and Chapters in Tro	Lab
Mon	June 24	Syllabus, Periodic Table 2.2 Scientific Notation 2.3 Significant Figures	Lab Safety
Tues	June 25	2.6 Dimensional Analysis & Measurements 3. Matter, Physical and Chemical Changes	Exp 3. Densities of Liquids and Solids
Wed	June 26	4. Atoms, Elements and Ions 5. Chemical Nomenclature: Ionic Compounds	Exp 1. Properties and Changes of Matter
Thur	June 27	Exam 1	Tutorial
Fri	June 28	5.11 and 6.1-6.1 The Mole 5. Chemical Nomenclature: Molecules	Nomenclature Handout Na,K demo
Mon	July 1	6.7 Percent Composition 6.8 Empirical Formulas	Exp 4: The Mole
Tues	July 2	5. Polyatomic ions and hydrates Percent water in Hydrates 7.1-7.4 Balancing Chemical Reactions	Exp 5. Simplest Formula of a Compound
Wed	July 3	Exam 2	Tutorial
Thurs	July 4	No class - Independence Day	
Mon	July 8	No class	
Tues	July 9	7.9-7.10 Types of Reactions 8. Stoichiometry	Exp 13: Percent water in hydrates Nomenclature handout
Wed	July 10	7.7 Net Ionic Equations, electrolytes 8.6-7 Limiting Reactants and % Yield	Exp 7: Percent copper recovery
Thurs	July 11	Exam 3	Tutorial
Fri	July 12	Last day to drop this class to get a "W"	
Mon	July 15	6. Thermochemistry 6. Calorimetry	Exp 8: Alum production from scrap aluminum Gold and Silver pennies
Tues	July 16	9 Electronic configuration 9.7, 9.9 and 10.2 Periodic Table Trends	Exp 2: Calorimetry
Wed	July 17	10. Bonding and 10.5 Lewis Diagrams 10.7 Geometry	Worksheet
Thur	July 18	Exam 4	Tutorial
Mon	July 22	10.8 Electronegativity, Polar Covalent Bonds and Polar Molecules 11. Gases	Lewis Diagrams and Molecular Models
Tues	July 23	11. Combined Gas law 11. Ideal Gas Law	Lab 10: Charles Law Gummy Bear Demo
Wed	July 24	11. Gas Stoichiometry and Partial Pressure 12. Liquids, Solids and Intermolecular Forces	Exp 9: Production of hydrogen gas
Thurs	July 25	Exam 5	Tutorial
Mon	July 29	13. Solutions, Dilutions 14. Acids and Bases 14.6 Titrations	Exp 14: Molar mass of a volatile gas
Tues	July 30	14. pH and pOH (bring your calculator) 15. Chemical Equilibrium	Exp 11: Acid base titration
Wed	July 31	17. Radioactivity	Making slime
Thurs	Aug 1	Exam 6	No lab or tutorial today