CHEM 3A Hybrid: Introductory General Chemistry.
Spring 2021

Instructor: Bill Blanken
Contact e-mail: bill.blanken@reedleycollege.edu using "Chem3A" in subject line, this helps keep the spam filter from rejecting the email if it comes from Yahoo etc.,

Course Objectives: Chemistry 3A is an elementary survey course in chemistry including hands on lab work. It is designed to give the student a chemistry background for a wide variety of careers including agriculture, forestry, nutrition, nursing, physical therapy, teaching and other biological and health related fields. It can also serve as a prep course for chem. 1A.

Math 3A, CHEM 10 or high school chemistry and **eligibility for ENGL 125 are strongly recommended**. Many students attempt to take CHEM3A without any prior chemistry. This is possible, but it takes a lot of **hard work**. Start seeing a tutor right from the beginning if you're having problems. Students will need to be familiar with college level algebra before taking this course as there is a lot of math and critical thinking involved. I also cannot stress enough the importance of working in study groups. This can be very helpful to some students. At the minimum, exchange email addresses and phone numbers with other class members to help keep up with what's going on in class throughout the semester.

Study Recommendations: Chemistry 3A is a fully transferable college level chemistry course. As a subject chemistry is very challenging, and the generally accepted rule of thumb for study time for a 4 unit chem class like chem 3A is 6 – 10 hours per week. Some students will require more and some less, this is dependent on the individual.

Text and Required Materials and Equipment:

- **Textbook**: Nivaldo J. Tro: "Introductory Chemistry", 6th edition, ISBN-13: 978-0321910295, or whatever the current edition is in the campus bookstore. However, in order to save money the 3rd,4th and 5th editions are acceptable as well. These can be rented or purchased through Amazon or other retailers. I also strongly recommend that the student purchase or rent the Student solutions manual that goes with the edition of textbook you are using. This will help with homework and studying for exams.
- You will also need materials to take notes and a basic scientific calculator with "exp" (or "EE") and "log" keys ($10 or less at Walmart)
- **You are required to buy an access code to Masteringchemistry.com, you have until midnight on Sat Jan 15 to purchase the code and set up Mastering chemistry or you will be dropped from the course**, this can be purchased bundled with the textbook or purchased by itself, directly from www.masteringchemistry.com , the course ID will be published on Canvas

Lab procedure and experiment explanation: since the entire class is a hybrid, it is not possible to perform experiments. The experiments will be virtual with a demonstration video. The lab write up will include questions pertaining to the demo video and the data that will be provided to each student. When the write up is completed a picture of the completed work will be submitted to Canvas and graded. The lab submission must be in jpeg or pdf format. If your submission cannot be viewed it will not be graded and be given a zero. You must show all your work, if no or insufficient work is shown reduced or no credit will be given for that question. Labs must be completed and submitted in the week they are due. The two lowest lab grades will be dropped. **No makeup labs will be available after the week they were assigned, late submissions will not be accepted for any reason.**

Important dates:
Jan 29 – Last day to drop the course without a W
Mar 12 – Last day to drop the course with a W and avoid a letter grade
Midterm exam – TBA – week of March 8 - 11
Final exam TBA, May 17 - 20
See the schedule of courses for additional dates and times

Lecture content: The course content is delivered via narrated PPT lecture video. In addition to the lecture videos there will be additional videos made available and linked to. It is imperative to stay up date and current with the course and to not fall behind. There will be required "check-ins" every week which will consist of attendance to 1 Zoom office hour each week for answering questions or issues that arise during the week. The Zoom office hours will be posted in Canvas.

Homework: Homework will be assigned for every chapter which is essentially every week. It is essential to your success in this chemistry course that you do all the assigned homework and read the relevant chapters in your textbook. The homework is electronic, and can be accessed through the Mastering Chemistry website, using the access code that was included with the textbook or purchased separately. If you purchased or rented a used textbook, you can purchase an access code to MasteringChemistry from www.masteringchemistry.com. There is an explanation video that will be linked to showing how to do so. There are no make-up homework assignments, the first assignment will be extra credit; the total HW percentage a student can earn will not exceed 100%.

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. I require that the request for accommodations be given to me 1 week prior to the event requiring accommodations.

Since this course is totally online attendance will be taken by completing and turning in the experiment and HW for the week. A student will be dropped during the first 9 weeks of school if they miss a cumulative total of 2 weeks of class without permission, this is 2

experiments and 2 HW assignments. **If 2 weeks of absences are accumulated after the 9 week cutoff the student will be assessed a 10% reduction in total grade points at the end of the semester. For each additional week of absence an additional 10% reduction will be assessed.**

Grading and Exams: There will be 3 exams, a midterm and a final over the course of the semester. **There are no makeup exams, however the lowest score of the 3 unit exams will be dropped**. The final exam is a **comprehensive final exam** covering all the course content of the semester. There will be extra credit available over the course of the semester and is entirely at the discretion of the instructor.

The final grade is calculated as follows:

Laboratory (20%) of total grade	**Lab experiments - 15% of total grade**
	Lab final exam 5% of total grade
Lecture Material (80%) of total grade	**3 Unit exams, lowest dropped 25% - electronic** **Midterm 18% - in person** **Final 22% - in person**
	Homework Assignments 15 %

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

Student Learning Outcomes

Student Learning Outcomes are statements about what the faculty expects you will be able to do at the end of the course. This is NOT a guarantee: the ultimate responsibility for whether you will be able to do these things lies with you, the student.

1. apply solution properties and stoichiometry to calculate quantities (e.g. moles, volume, grams) of reactants and products in a reaction;
2. develop techniques to write Lewis electron-dot formulas and identify the shape using the VSEPR theory;
3. identify the nature and applications for electron exchange reactions;
4. prepare and solve simple mathematical problems involving formula calculations related to gas laws;
5. calculate molarity, mass percentage concentration and density of solutions and apply the molarity in dilution calculations.
6. identify types of matter, recognize physical properties and chemical properties, and apply the Law of Conservation of Mass and the Law of Conservation of Energy;
7. describe the impact of chemistry on modern society and the relationship between chemistry and other disciplines including agriculture, the medical field, and industry;
8. distinguish and identify metals, non-metals, metalloids, alkali metals, alkaline earth metals, halogens, noble gases, transition metals, and of the lanthanide and actinide series;
9. identify the principles of equilibrium in reversible reactions, saturated solutions, solutions of weak electrolytes and solutions of gases in solving related problems;
10. use the periodic table to identify physical and chemical properties of elements and calculate molar masses of compounds and molecules;

11. explain, 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;
12. identify different types of intramolecular and intermolecular forces of attraction present in various substances based on chemical formulas and structures;
13. define and identify acids and bases and perform math calculations involving pH measurements;
14. explain colligative properties of solutions (e.g. boiling point elevation, freezing point depression, and osmotic pressure);
15. calculate empirical formulas, and mass percentage composition given the appropriate data;
16. explain state and energy changes accompanying heating and cooling curves;
17. recognize the electromagnetic spectrum and explain the basic principles of the quantum mechanical model of the atom;
18. diagram heating and cooling curves;
19. perform unit conversions using the correct significant figures; between the English and metric systems, temperatures in different units, density, energy, and with SI units;
20. understand the structure of the atomic nucleus;
21. explain the fundamental types of nuclear radiation and the effects they have on biological systems
22. predict the physical behavior of gases to pressure, temperature, and volume changes;
23. apply gas laws and stoichiometry to calculate quantities (e.g. moles, volume, grams) of gas produced or consumed during a reaction;
24. perform calculations involving a limiting reactant and determine the percent yield;
25. name inorganic compounds given their formulas, and write formulas given names;
26. complete, identify type and balance chemical equations of reactions;
27. demonstrate laboratory skills which include operating an analytical balance; calibrating and/or use fundamental lab equipment such as a thermometer, barometer, burette, pipette; recognizing use and limitations of laboratory glassware; recording and repo