

# Chemistry 3A: Introductory General Chemistry Course Syllabus

Reedley Community College, Summer 2022-Section 59501& Section 59502

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**Course:** CHEM 3A  
**Credits:** 4.00 units (3 lecture hours, 3 lab hours)  
**Instructor:** Pahoua Xiong  
**E-mail:** pahoua.xiong@sccd.edu

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**Meeting Times:** Lecture: MTWTh 7:45 am - 10:50 am (Sanger Community Campus, Room HS)

Lab: MTWTh 11:00 pm - 2:05 pm (Sanger Community Campus, Room HS)

**Prerequisites:** Subject Prerequisites: Mathematics 103

Advisories: English 1A and High School Chemistry or Chemistry 10.

**Course Description:** This is a survey course in the principles of inorganic chemistry covering the composition of matter, physical and chemical changes, atomic and molecular structure, inorganic nomenclature, chemical formula and reaction calculations, gas laws, bonding, solutions, net-ionic equations, acid-base theories, pH, oxidation-reduction reactions, thermodynamics, nuclear chemistry and equilibrium. The course emphasizes problem solving and chemical calculations. Both qualitative and quantitative theory and techniques will be covered. It is intended for applied science and non-science majors or for students preparing to take Chemistry 1A. (A, CSU-GE, UC, I).

## Materials and Resources

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Required materials and expectations for CHEM 3A. You will need to have the followings:

- 1. Lecture Text:** *Introductory Chemistry 6<sup>th</sup> Ed* by Nivaldo Tro
- 2. Lab Text:** *Available on Canvas* (Must be print out and bring to lab)
- 3. Laptop/Tablet/Internet access:** For online homework, to access Canvas for class materials or to view grades, and communication related to course materials.
- 4. Online Homework:** MyLab and Mastering Chemistry is an on-line homework system that will be use in this course. A Mastering Chemistry Access Code is bundled with the 6<sup>th</sup> edition e-texts sold in the bookstore or you may purchase a copy online. To sign up for the homework online, you will need the Course ID **MCXIONG83609** and your Student ID. Homework is assigned for every chapter lecture in canvas. It is essential to your success in this class that you do all the assigned homework online and read the relevant sections in your Textbook. All homework questions will be online. 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. **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.
- 5. Scientific Calculator:** A simple statistic function calculator that has square root, log, 10x, and scientific notation are allowed during examination. **NO** graphing or programmable calculators are allowed.

## **Mandatory Lab Supplies:**

1. Approved chemical splash goggle (3M, Uvex, etc.)
2. Knee length Lab Coat

## **Important Dates**

**Last Day to drop for a refund:** Wednesday, June 15, 2022 at 5pm

**Last day to add class, or drop class to avoid a “W”:** Sunday, June 19, 2022

**Last Day to drop class with a “W”:** Tuesday, June 28, 2022 at 5pm

**Final Exam Date:** Wednesday, July 13, 2022 at 7:45 am

## **ATTENDANCE POLICY:**

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 questions are posted in canvas thru MyLab and Mastering Chemistry 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 schedule during one of your dry lab sessions. If you miss a second exam you will get zero for that exam.

## **Emailing**

In the subject line include your class name in all capitals followed by a colon and a brief description of the email. For example: CHEM 3A: Quiz 2 grade check. If it is a lengthy question or response, please talk to me in person.

## **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 the 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.

## **Appropriate Classroom Decorum**

All students have a right to be in a classroom atmosphere that encourages learning. This entails showing respect for all points of view and the rights of others always. To ensure a classroom atmosphere that is not disruptive and encourages learning, please follow these simple rules of etiquette:

1. Arrive on time for class.
2. 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.
3. If you must arrive late, take a seat quickly and quietly near the door or at the back of room.
4. Turn OFF or put your cell phone onto “silent buzzer” mode during the lectures so as not to disturb the class.
5. Remove headphones and turn off iPods/music players
6. End **ALL** private conversations once class starts.
7. Use laptops for note takings during lecture but not for emailing, Facebooking, tweeting, IM’ing, web surfing, doing online homework, etc.
8. **No extra credit will be given. You need to work consistently from the beginning.**
9. Fraudulent behavior during exams is graded with a (0) zero.
10. Please use the restroom before coming to an exam. Nobody will be allowed to go to the restroom during an exam.

*Please be considerate of others.*

## **Class Attendance & Absentee Policy:**

There will be a sign in/out sheet by the door to document attendance. Put your INITIALS by your name when you ARRIVE; put your SIGNATURE by your name when you LEAVE. Students are responsible for all material covered and all announcements made in class whether they are present or not.

LABORATORY ATTENDANCE IS MANDATORY. Chemistry is a hand-on science; therefore, you need to be in lab. The development of laboratory skills is an important part of this course. Showing up late for lab is a safety risk for yourself and others, since specific safety concerns are generally discussed at the beginning of lab. Students that have an unexcused absence will **not** be allowed to make up the lab, as it is an unfair hindrance for the other students.

You can be dropped from the course for missing class for three continuous days or irregular or frequent tardies. If you’re late, it’s your responsibility to make sure you aren’t listed as absent in the canvas attendance. There are **no** “excused absences” unless approved by the instructor (24-hour prior notification and documentation establishing excruciating/unavoidable circumstances are required for “excused absence” consideration. Emergency situations need to be communicated with the instructor within 48 hours of the absence).

**Disruptive Behavior:** Disruptive behavior can include, but not limited to, disrupting class by unreasonable outbursts, verbally abusive to instructor, etc. Instances of disruptive behavior will be reported to the dean of students.

**Missed exams and labs:** There will be **NO** make-up exams (except with prior approval from instructor), quizzes, or labs.

**Withdrawal from the course:** To withdrawal from the course, you must withdrawal from the class through admissions and records. Do not depend on your instructor to drop you. Doing so may result in a F for the class.

**YOU MUST ALWAYS WEAR SAFETY GLASSES AND A LAB COAT IN THE LABORATORY WHEN CONDUCTING AN EXPERIMENT IN LAB.**

- Bare skin should be minimized (no sandals, shorts, short skirts, dresses or exposed midriffs). If you look down at your feet, you should see no skin (including the tops of your feet).
- Leather shoes are highly recommended. No high heels or platform shoes.
- Wear clothes that you do not mind ruining. A lab coat extends past your knees. A lab jacket is not acceptable.
- Long hair must be put up or tied back. Fingernails cannot be so long as to interfere with safe use of glassware and chemicals.
- Music with or without headphones is not allowed in lab. You must remain aware and alert of your surroundings to avoid potential dangers.
- **Safety:** Careless safety procedures, including but not limited to not wearing appropriate clothing and safety glasses, may adversely affect your grade. For violating safety rules previously explained in the pre-lab lecture, your grade may be lowered by ONE OR MORE LETTER GRADES for unsafe practices in the laboratory, and for gross violations, such as doing unauthorized experiments, you can be failed for the entire Chem 3A.

## Course Policies

### Grading

<b>Lab Report</b>	<b>20%</b>
<b>Lab Practical</b>	<b>5%</b>
<b>Lab Patrol</b>	<b>1%</b>
<b>Homework</b>	<b>14%</b>
<b>Exam</b>	<b>40%</b>
<b><u>Final Exam</u></b>	<b><u>20%</u></b>
<b>Total</b>	<b>100%</b>

The letter grades assigned at the end of the course will be based on your cumulative points as follows:

<b>A</b>	<b>90-100%</b>
<b>B</b>	<b>80-89%</b>
<b>C</b>	<b>70-79%</b>
<b>D</b>	<b>60-69%</b>
<b>F<sup>†</sup></b>	<b>&lt; 59%</b>

I may use my assessment of improvement, participation in class, regular completion of homework, and/or consistent course performance to evaluate whether borderline scores (e.g. 89%) are moved up to the next grade bracket.

### Lab Reports

There are pre-lab experiment questions that need to be completed for each experiment before the start of lab. The purpose of the experiment pre-lab is to ensure that students have read the experiment and are aware of the

safety precautions that are needed when handling chemicals or operating the equipment. **If you come to lab without the pre-lab questions done, you will be asked to complete the pre-lab questions; you will also lose the points of that lab report's grade.** If you do not finish the pre-lab within the allocated time (usually 15 minutes), you will not be allowed to participate in that experiment.

The experiments will be done at Sanger High School chemistry laboratory and will require that all students completed the lab safety contract. Students will need to follow the lab safety code by wearing the appropriate personal protective equipment such as a lab coat and goggles. All lab reports are due in canvas. If you submit an assignment online where I cannot read it, I will not grade it. **YOU MUST SHOW YOUR WORK** by showing the setup for all calculations and problems. You will get no credit for magic answers whether right or wrong (magic answers = answers that appear out of nowhere). **The lab report will consist of the prelab questions, data recording sheets and post-lab questions.** Each lab report is worth 50 points. There will be four worksheet chapter assignments included within your lab grade; each worth 50 points. Students will download the chapter worksheets and complete the questions themselves. To receive credits for the chapter worksheet assignments, students will submit the completed worksheet chapter to canvas.

### **Lab Practical**

The lab practical is a timed test of laboratory skills that will be administered during the last week of the semester in your laboratory class period. The lab practical will cover techniques, skills, calculations, terminology, and safety regulations learned in the previous experiments. Essentially, the Lab Practical is your "Final Exam" for Lab. For more information, read the assignment description. No makeup lab practical will be given.

### **Lab Patrol**

For each wet lab day, students will sign up to be a lab patrol. Your task for that day is to help ensure that your lab mates have taken good care of the laboratory and the equipment. It is your responsibility to know which day or days you have been assigned. At the end of the class, you will review a checklist to make sure that everything has been completed. You are to then turn in that checklist for grading.

### **MyLab and Mastering Homework**

We will be using the MyLab and Mastering Chemistry online homework system for this course. It is advised to keep a journal where you record all the steps, calculations and reasoning to arrive to the final answer in a neat and organized manner. While doing the homework, you may use the book, a friend/tutor, or ask me in class. For technical issues, take advantage of the 24/7 online chat help through MyLab and Mastering Chemistry

### **Exams**

There will be 4 exams each worth 100 points in your canvas course. The exams will mainly cover the most recent topics, but can have some comprehensive questions. Types of questions may include multiple choice, essay, matching, and diagrams. **If you miss an exam your score for that exam is zero.** If you know you are going to miss an exam due to an excused reason, you need to let me know prior to the exam and make arrangements to take it at an earlier or later date.

### **Final Exam**

The final can include anything from the chapter lecture, homework, other questions from the text. Types of questions may include multiple choice, essay, matching, and diagrams. **The final is mandatory to pass the class. No make-up final will be given.**

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## Reedley Community College Policies

**Cheating:** Cheating is the act or attempted act of taking an examination or performing an assigned, evaluated task in a fraudulent or deceptive manner, such as having improper access to answers, in an attempt to gain an unearned academic advantage. Cheating may include, but is not limited to, copying from another's work, supplying one's work to another, giving or receiving copies of examinations without an instructor's permission, using or displaying notes or devices inappropriate to the conditions of the examination, allowing someone other than the officially enrolled student to represent the student, or failing to disclose research results completely.

- You are encouraged to work together on labs. However, ***your individual work must be evident***. Do not allow others to copy directly from your work. Instances of confirmed cheating will generally result in failure in this course and be referred to the Dean for further action.
- Electronic devices such as cell phones; iPods, etc. are not allowed during exams and must be put away in a backpack or purse. If a student has an electronic device on their person during an exam, it will be considered cheating.
- Instances of confirmed cheating will generally result in failure in this course and be referred to the Dean for further action. As an alternative to automatic failure in the course, at the instructor's discretion, you may instead be assigned negative credit for points possible on the assignment. In this instance, the score would not be allowed to be dropped as your lowest score.

**Plagiarism:** Plagiarism is a specific form of cheating: the use of another's words or ideas without identifying them as such or giving credit to the source. One of the most common forms of this is copying information from a website and pasting it into your document. Instances of plagiarism will be treated like any other form of cheating.

**Laboratory Safety:** The first day of lab we will cover various safety rules. If you do not follow these rules you will be asked to leave, and you may be dropped from the course. For example, if you refuse to wear safety glasses or if you were to eat or drink any chemical reagent, you would be immediately and permanently removed from the course for your own protection and those around you.

**Disabled Students:** It is our policy not to discriminate against any student. If you suspect that you have any type of physical disability or learning disability that is relevant to your performance in the course, please stop by the disabled student services office and discuss it with them as they may be able to provide services and support that could help you succeed. 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.

**Electronic Devices:** Use of electronic devices (Laptop, iPod, etc.) in the classroom is acceptable if it does not cause a distraction for the instructor or fellow students. In lab, they must also be used in such a way as to not cause a safety risk. For example, do not handle chemicals and talk on your cell phone at the same time. Electronic devices of any kind are NEVER permitted during exams.

**Classroom Visitors:** In accordance with Reedley City College policy, only students currently enrolled in the course will be allowed in the classroom during lab and lecture.

## Summer 2022 CHEM 3A Tentative Lecture and Lab Course Schedule

This schedule is intended to help you plan and prepare for the course. It may change as the course progresses.

Week of		Lecture Topics	Lab Assignment	What's Due in Lab?
1	15-Jun Wed	Course Introduction, Periodic Table Ch 1: Chemical World Ch 2: Measurement and Problem Solving	Safety and Laboratory Introduction, <b>Exp 3 Pre-Lab Questions &amp; Worksheet Ch 2</b>	Exp 3 PL
	16-Jun, Thu.	Ch 3: Matter, Physical and Chemical Changes Ch 4: Atoms and Elements	<b>Exp 3: Density of Liquids and Solids</b>	Exp 3 L R and Exp 1 PL
2	20-Jun, Mon	Ch 4: Atoms and Elements Ch. 5: Molecules and Compounds	<b>Exp 1: Properties and Changes of Matter</b>	Exp 1 LR and Exp 4 PL
	21-Jun, Tue	Ch. 6: Chemical Composition	<b>Exp 4: The Mole</b>	Exp 4 L R and Exp 5 PL
	22-Jun, Wed	Ch. 7: Chemical Reactions	<b>Exp 5: Empirical Formulas of a Compound</b>	Exp 5 PL
	23-Jun, Th	Ch. 8: Quantities in Chemical Reactions	<b>Lecture Exam 1 (Ch 2-5) &amp; Worksheet Ch 8</b>	<b>Wk Ch. 8</b>
3	27-Jun, Mon	Ch. 9: Electrons & Periodic Table	<b>Exp 13: Percent Water in Hydrates</b>	Exp 13 LR and Exp 7 PL
	28-Jun, Tue	Ch. 10: Chemical Bonding,	<b>Exp 7: Reaction Types- Copper Chemistry</b>	Exp 7 LR and Exp 8 PL
	29-Jun, Wed	Ch. 11: Gases	<b>Exp 2: Calorimetry and Specific Heat of a Metal</b>	Exp 2 LR
	30-Jun, Thu.	Ch. 12: Liquids, Solids, & Inter. Forces	<b>Lecture Exam 2 (Ch 6-9) &amp; Worksheet Ch 12</b>	Exp 14 PL
4	4-Jul, Mon	<b>Independence Day- No Class</b>	<b>No Laboratory</b>	
	5-Jul, Tue	Ch. 13: Solutions	<b>Exp. 14: Determining the Molar Mass of a Volatile Liquid</b>	Exp 14 LR and Exp 8 PL
	6-Jul, Wed	Ch 14 : Acids and Bases	<b>Exp. 8: Alum Production from Scrap Aluminum &amp; Lab Practical</b>	Exp 8 LR
	7-Jul, Th	Ch 15 : Chemical Equilibrium	<b>Lecture Exam 3 (Ch 10-13) &amp; Worksheet Ch 13</b>	Exp 9 PL
5	11-Jul, Mon	Ch 17 : Radioactivity	<b>Exp. 9: Production of Hydrogen Gas</b>	Exp 9 LR and Exp 11 PL
	12-Jul, Tue	<b>Lecture Exam 4 (Ch 14, 15, &amp;17)</b>	<b>Exp. 11: Acid Base Titration</b>	Exp 11 LR
	13-Jul, Wed	<b>Final Exam</b>	<b>No Laboratory</b>	



