

**CHEM 3A: Introductory General Chemistry**  
Summer 2021 Section 59101

Instructor: Ryan Umar M.S.

Lab/Lectures: Released daily at midnight.

Preferred methods of communication:

- **Canvas Inbox**
- [Announcements](#) (please adjust settings to forward announcements to your email)
- Email (ryan.umar@cloviscollege.edu) but include CHEM3A RMCHS in the subject
- All notes, labs, grades, quizzes etc. will be posted on Canvas

If I do not respond to a message in 24 hours please resend the message

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. Nivaldo J. Tro: "Introductory Chemistry" **4th** Edition or newer. The Mastering Chemistry CD is needed. You do have the option of buying the e-text and mastering chemistry homework directly from the Pearson website.
2. Download lecture presentations from Canvas
3. You will need to be able to take a photo of your lab reports, assignments, scratch paper in exams and submit them online on Canvas
4. You will need a calculator with "exp" (or "EE") and "log" keys (\$12 at Walmart), but not a programmable calculator.

Online Class Attendance and Participation Policy Requirements:

Your participation matters! Remember that this is an online class and simply logging into Canvas is not enough to be marked present. This means that you need to complete assignments listed under [modules](#) for each day. If you do not post and contribute to the daily assignments and discussions boards you will be marked absent for that day. Students who do not submit any assignments during the first day of class (or contact me with a valid excuse) will be dropped to allow waitlisted students to register. The daily modules must be completed, two or more incomplete modules will result in a failing score for the course.

Students who have not participated in the class for three days, or the last two days before the drop date, may be dropped. This is to enable you to get a "W" rather than a letter grade. If you have a valid reason for not participating please contact me so we can discuss your situation.

Online Assignments Late Work Policy:

Online assignments are due on the assigned due date and time as stated per assignment. If you turn in homework late you will lose 10%. I can't accept homework/labs later than noon the next day. No homework will be accepted after the final exam. Homework will be completed

through Mastering Chemistry. I have enabled the “Adaptive Follow Up” in order to give you back points if you performed poorly on the initial assignment.

#### Quizzes and Exams Late Work Policy:

A make-up quiz/exam will only be given due to extreme circumstances, with verifiable written proof, at the discretion of the instructor. Make-up quizzes/exams must be taken within a week of the original exam date. Only one make-up quiz/exam will be allowed per student.

Lecture Notes: The ability to listen carefully and to take good lecture notes in an essential college skill. Students should print out the lecture presentations and actively participate in the examples presented throughout the presentation. (If you need an accommodation to have a note-taker or another accommodation, please contact the DSP&S office). The lecture and lab assignments will be distributed to you from your school, or available on Canvas to print. Fill these out, take a photo and submit them on Canvas by the due date, as an assignment under each “Module”. Studies have shown that 90% of the lecture material is retained if you do the homework straight after viewing the lecture video and reading the section in your textbook. If you wait until the day before the exam you will only retain 35%. Keep these homework and lab assignments and review them the day before your exam.

Homework and Lab Reports: Homework will be assigned every lecture and a lab report after every lab video. It is essential to your success in this class that you do all the assigned homework and lab reports, and read the relevant sections in your Textbook. All homework/lab reports will due midnight the day following the lecture/lab and selected problems graded. This is to ensure that you work consistently and can apply what you learn to problems. 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. You can also do the odd number problems in your textbook for extra practice and check the answers at the back of the textbook. The homework will be completed using the Mastering Chemistry platform and graded immediately. Lab Reports will be graded accordingly:

- Pre-Lab
  - Have watched all intro videos and completed a typed outline of the experiment to be conducted.
    - Outline
      - Title of lab
      - Purpose of lab
      - Chemicals and equipment needed
      - Chemical safety/hazards
      - Outline of procedure
- Lab safety (applicable to in-person labs)
  - You must wear safety goggles/glasses and close toed shoes.
  - You must follow all instructions given by the lab kit supplier.
  - Report any accidents to me immediately.
- Experiments
  - You must watch and participate in all virtual lab experiments with your lab teammates. Simply watching the video and not working on the lab with your teammates will result in a loss of your participation points for the week and deductions from the experiment’s grade.
  - You must participate in all lab kit experiments with your lab teammates. Duties can be distributed as you see fit but every member must contribute and work together. Failure to work with your team will result in deductions from the experiments grade.

- Calculations
  - All calculations must be shown on the lab report rather through typing on the word document or inserting a picture of the handwritten work. All calculations must be legible and properly labelled/placed to receive credit. **Answers without calculations will not be given credit.**
- Lab Reports
  - Grading
    - 25% Pre-Lab
    - 50% Lab Report
    - 25% Post Lab
  - Late work is determined on a case-by-case basis.
  - Lab will be submitted in their respective modules and are due at the end of each module.
  - A module cannot be completed without its respective lab.

Last day to drop class to avoid a "W": June 18<sup>th</sup>

Drop Date: The last day to drop this class is June 26th.

After this date a grade will be assigned.

Exam and lab quiz dates: June 22<sup>nd</sup> , June 28<sup>th</sup> , July 2<sup>nd</sup> , July 9<sup>th</sup>

**Grading and Exams:** There will be 4 exams covering the material of previous lectures. These 4 exams will be equally weighted and count 40% all together (10% each). The final exam, (exam 4) is cumulative. I will not drop any exam, lab or homework assignment this summer. In order to receive any credit on an exam, you must show all work including units and significant figures.

Laboratory (20%)	Lecture (80%)
Lab reports	Exams (40%)
	Homework (20%)
	Participation (20%)

*Table 1 Grading Policy*

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:

- Fraudulent behavior during exams or submitted work is graded with a (0) zero.

**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:

- 1) Use dimensional analysis to solve for an unknown parameter of density, volume, mass, pressure, temperature, molar mass, concentration, or an empirical formula.

- 2) Construct and balance a chemical reaction and use the reaction to predict stoichiometric quantities.
- 3) Explain concepts from the periodic table and use the periodic table to solve chemical problems.
- 4) Describe acid-base reactions and how to calculate pH.
- 5) Name and draw Lewis diagrams of inorganic and molecular compounds from the formula and vice versa.
- 6) Safely conduct laboratory experiments implementing concepts and principles learned in lecture.

### Course Objectives:

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

- 1) 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;
- 2) 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;
- 3) perform unit conversions using the correct significant figures; between the English and metric systems, temperatures in different units, density, energy, and with SI units;
- 4) use the periodic table to predict physical and chemical properties of elements and calculate molar masses of compounds and molecules;
- 5) recognize the electromagnetic spectrum and have a basic understanding of the quantum mechanical model of the atom
- 6) demonstrate the ability to name inorganic compounds given their formulas, and write formulas given names;
- 7) 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;
- 8) distinguish and identify between different types of intramolecular and intermolecular forces of attraction present in various substances based on chemical formulas and structures;
- 9) write Lewis Electron-Dot Formulas and identify the shape using VSEPR method;
- 10) 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;
- 11) calculate, empirical formulas, and percentage composition given the appropriate data;
- 12) distinguish and balance chemical equations of different types of reactions;
- 13) perform calculations involving a limiting reagent and determining the percent yield;
- 14) predict the physical behavior of gases to pressure, temperature, and volume changes;
- 15) solve simple mathematical problems involving formula calculations related to gas laws;
- 16) use gas laws and stoichiometry to calculate quantities (e.g. moles, volume, grams) of gas produced or consumed during a reaction;
- 17) calculate various parameters of solutions including molarity, dilution techniques, percentage concentration, and density.
- 18) construct heating and cooling curves;
- 19) describe state and energy changes accompanying heating and cooling curves;

- 20) apply the principles of equilibrium in reversible reactions, saturated solutions, solutions of weak electrolytes and solutions of gases in solving related problems;
- 21) use solution properties and stoichiometry to calculate quantities (e.g. moles, volume, grams) produced or consumed during a reaction;
- 22) describe colligative properties of solutions (e.g. boiling point elevation, freezing point depression, and osmotic pressure);
- 23) define and identify acids and bases and be able to perform math calculations involving the pH;
- 24) determine the nature and applications for electron exchange reactions;
- 25) understand the structure of the atomic nucleus;
- 26) understand the fundamental types of nuclear radiation and the effects they have on biological systems
- 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 reporting observations; using error analysis techniques to evaluate certainty of data; use safety precautions and general laboratory procedures.

\*\*I reserve the right to make changes to the syllabus/schedule at any time.

**CHEM 3A Summer 2021**

		<b>Date</b>	<b>Lecture Topic and Chapters in Tro</b>	<b>Lab</b>	<b>HW</b>
Week 1	Mon	June 14			
	Tue	June 15	How to Succeed in an Online Class Syllabus, Introduction, Expectations		
	Wed	June 16	Ch 2 Measurements and Problem Solving	Lab Safety Math Review	MC Ch 2
	Thurs	June 17	Ch 3 Matter and Energy	Measurements Lab	MC Ch 3
	Fri	June 18	Ch 4 Atoms and elements	Density Lab	MC Ch 4
	<b>Fri</b>	<b>June 18</b>	<b>Last day to drop and avoid a "W"</b>		
Week 2	Mon	June 21	Ch 5 Molecules and Compounds	Properties and Changes of Matter	MC Ch 5
	Tues	June 22	Ch 6 Chemical Composition <b>Exam 1</b>		MC Ch 6
	Wed	June 23	Ch 7 Chemical Reactions	Lab 4: Moles	MC Ch 7
	Thurs	June 24	Ch 8 Quantities in Chemical Reactions	Lab 5. Empirical Formula of a Compound	MC Ch 8
	Fri	June 25	Ch 9 Electrons in Atoms and Periodic Table	Lab 13: Percent water in hydrates	MC Ch 9
	<b>Sat</b>	<b>June 26</b>	<b>Last day to drop with a W</b>		
Week 3	Mon	June 28	Ch 10 Chemical Bonding <b>Exam 2</b>	<b>Nomenclature 2 Worksheet</b> <b>Stoichiometry Worksheet</b>	MC Ch 10
	Tues	June 29	Ch 11 Gasses	Lab 2: Calorimetry	MC Ch 11
	Wed	June 30	Ch 12 Liquids, Solids, and Intermolecular Forces	Lewis Diagrams and Molecular Models	MC Ch 12
	Thurs	July 1	Ch 13 Solutions	Lab 10: Charles' Law	MC Ch 13
	Fri	July 2	Ch 14 Acids and Bases <b>Exam 3</b>	Lab 14: Molar mass of a volatile gas	MC Ch 14
Week 4	Mon	July 05	Observance of Independence Day	<b>No School</b>	
	Tues	July 06	Ch 15 Chemical Equilibrium	Lab 8: Alum production from scrap aluminum	MC Ch 15
	Wed	July 07	Ch 17 Radioactive and Nuclear Chemistry	PH Lab	MC Ch 17
	Thurs	July 08	Review	Lab 11: Acid-base titration	
	Fri	July 09	<b>Exam 4 – Cumulative Final</b>		