

Chemistry 3A/3AL Course Syllabus General Chemistry

Santa Rosa Junior College Summer 2023

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Lab Lecture

T,W,Th 8:00-9:00, Bech 1910

Lab

T,W,Th 9:00-12:00, Bech 1980

Lecture

M-Th 12:40-2:50, Bech 1901

Office Hours

M 11:00 – 12:30, Bech 1970

T-Th 12:00 – 12:30, Bech 1970

T – Th 2:50 – 3:10, Bech 1970

F 11:00 – 1:00, Zoom

<https://santarosa-edu.zoom.us/j/82541416389>

This syllabus is to be considered as an agreement. Continued registration in this course means that you agree to the policies and procedures outlined in this syllabus. This syllabus is intended to give the student guidance in what may be covered during the semester and will be followed as closely as possible. However, the instructor reserves the right to modify, supplement and make changes as the course needs arise.

Important Dates

Monday, June 19 – Last day to drop without a W (or add w/approval)

Tuesday, July 11 – Last day to withdraw with a W

Thursday, July 20 - Final exam

Course Description

This course teaches general principles of chemistry including atomic theory, bonding, stoichiometry, kinetic molecular theory, properties of mixtures, the periodic table and thermodynamics. This is the first semester of a one-year program of general chemistry.

Prerequisites

Concurrent enrollment in 3A and 3AL AND Course Completion of CHEM 42, or one year of high school chemistry taken within the last five years with a grade of B or higher; AND Course Completion of MATH 154 or MATH 155 or MATH 156 or higher (MATH) or appropriate placement based on AB705 mandates.

Student Learning Outcomes:

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

1. Describe matter, its transformations and corresponding energy changes according to prevailing chemical theories.
2. Interpret and solve problems in a chemical context using quantitative reasoning.

3. Demonstrate proficiency in fundamental chemistry laboratory techniques.
4. Carry out experiments safely and carefully in the lab.
5. Obtain accurate data and interpret and manipulate the data correctly.
6. Relate experimental observation in the lab to theoretical chemical concepts from the lecture.

Objectives:

After successful completion of this course, a student will be able to:

1. Use dimensional analysis and stoichiometry to solve quantitative chemical problems.
2. Apply atomic theory in describing matter, including chemical nomenclature and physical and chemical processes.
3. Summarize the quantum mechanical structure of the hydrogen atom in light of its emission spectrum, and apply it to many-electron systems.
4. Calculate energy changes in calorimetry and chemical reactions.
5. Use the periodic table of elements to recognize trends and patterns, and to perform calculations.
6. Describe the bonding and shapes of simple compounds with a range of models.
7. Apply kinetic-molecular theory to the behavior of ideal and real gases.
8. Relate intermolecular forces to the physical properties of matter.
9. Calculate the effects of solute concentration on the physical properties of solutions.
10. Use appropriate techniques to obtain accurate and precise measurements in the laboratory.
11. Identify the uncertainty and analyze experimental error associated with measurements.
12. Graph (as appropriate), interpret, and communicate the results of laboratory experiments in writing.
13. Apply chemical principles to real world situations.
Prepare for and conduct experiments, safely and correctly, and clean up and dispose of waste.
14. Perform synthesis, characterization, and determination of yield
15. Experimentally verify known physical quantities.
16. Identify and perform quantitative analysis on mixtures.
17. Measure physical and chemical properties,
18. Generate calibration curves and use them with an appropriate level of precision.
19. Use scientific writing and format to clearly communicate results of experiments.

Required Course Materials

1. **Textbook:** Chemistry, 10th Edition by Zumdahl and DeCoste, Cengage, 2018. ISBN: 978-1-305-95740-4 or loose-leaf: 978-1-305-95766-4
2. **Chemistry Laboratory Manual (3AL only)** Chem 3AL General Chemistry (Spring 2023)

3. **Chemistry Laboratory Notebook (3AL only)** no need for lab notebooks making duplicate copies. A simple lined or graphing notebook that is dedicated to this class is fine.
4. A scientific **calculator** with exponential & logarithmic capabilities.
5. **Protective eyewear (splash goggles) and a rubberized apron** Must use one of the types sold by the bookstore.

Grading: Lecture

Your semester grade is based on three unit exams, a small homework/quiz component, and the final exam.

Unit exams	60 %
Final exam	20 %
Quizzes	10 %
Homework/Join In ?	10 %
Maximum Possible	100 %

Grading: Lab

Your semester grade is based on the completed lab write-up of 12 labs or worksheets. Most lab reports will be due the lab period following the completion of the experiment. On occasion, lab report extensions will be given. Most labs will be worth the same number of points (20). Your lowest lab score will be dropped.

Grades are neither bestowed upon students by instructors, nor are they an entitlement, but are entirely *earned* by students. Realize that both objective factors (such as exam scores and problem/homework scores to which numerical values can be assigned) and subjective factors (such as effort, improvement, initiative, honesty, participation, academic growth, etc., which cannot be easily tagged with a number) will be taken into account at the end of the semester when letter grade assignments are made. Borderline cases will be decided after taking into consideration such factors as: *academic growth, classroom participation, initiative, attendance, punctuality, positive attitude and individual motivation.*

Approximate Scale for Letter Grades

A (88-100%) B (77 – 87%) C (66 – 76%) D (50 – 65%) F (Below 50%)

Make-up Policy

All exams will be given in class on the day and time listed on the schedule. Missed exams due to medical and family emergencies will be addressed on an individual basis; however, valid documentation must be provided. There are no make-up labs.

Unit Exams

Each of the three unit exams will be based on material covered in classroom and homework completed to that date.

Final Exam

The final exam will be a comprehensive, multiple choice exam covering all topics covered during the semester and separated into 3 sections corresponding to the subjects of your 3 unit exams. The grade on one low scoring unit exam can be replaced with a better score in the corresponding unit in the final exam.

Homework/Quizzes

Quizzes may be assigned on-line and will be announced in advance. Homework will be assigned from the textbook as needed.

Laboratory (3AL only)

Experiments will serve to reinforce concepts covered in lecture and will also be used to introduce new ideas. Additionally, they allow you to gain the experience of being an experimental scientist and allow you to see Chemistry in action. There will be a mixture of experiments, conceptual worksheets, and additional lecture topics. Note that any of these activities are also potential sources of material for exams. You should come to each lab session with 1) your lab notebook, 2) a pen to record data, and 3) your lab manual and 4) a calculator. The section of your lab manual describing the scheduled activity must be read, all videos must be watched and any pre-lab assignments must be completed before lab commences. A student who receives an "incomplete" rating on three or more lab activities will receive a grade of F for the laboratory course. Completion of a lab activity requires attendance of the lab session and submission of a lab report. See lab schedule for report due dates. Of primary importance during the lab sessions is **safety**. For this reason, anyone who arrives late to a lab lecture and does not hear the introductory lecture may be prohibited from performing that experiment. Students must wear approved safety goggles at all times while in the laboratories. Goggles and aprons will be provided during lab check-in. If you arrive more than 10 minutes late to lab or do not have your pre-laboratory assignment, you will not be allowed to start the lab. More info to be given in lab.

For laboratory reports, neatness, organization, completeness and accuracy are not only expected, **they are demanded!** Any work that is sloppy, poorly organized, incomplete or inaccurately done will be either rejected or severely graded. Reports that are submitted after the time due will be accepted with a penalty. **Reports submitted more than 1 week late will not be accepted.**

Student Expectations

Academic Decorum

All students are expected to know the Student Conduct Code (<https://student-conduct.santarosa.edu/>) and adhere to it in this class. Inappropriate behavior in the classroom will result in a referral to the Vice President of Student Services for disciplinary due process.

Each student is expected to be considerate and polite to fellow students and instructor. Please turn off all potentially disruptive electronic devices before start of class. If arriving late, please enter quietly. If you must leave due to exigent circumstances, please seat yourself such that you can exit with minimal disruption to other students and the instructor.

Academic Integrity

Students are expected to complete all assignments, lab reports and examinations with total honesty. Although working together on these assignments is allowed, each student must do his/her own work and use his/her own words. **Copying another student's work or laboratory assignments is considered cheating and both students will receive a ZERO for the assignment.** Please read the college policy/procedure on academic integrity at: <https://rightsresponsibilities.santarosa.edu/academic-integrity> Students who violate the district standards of academic honesty by engaging in cheating, plagiarism, impersonation, mis-representation of facts or committing other acts of dishonesty will be dismissed and a grade of "F" will be assigned, regardless of their level of performance up to that point in the semester.

Good Labkeeping

Maintaining a tidy work area in the lab and cleaning up after yourself are requirements for (1) participating in and (2) leaving the laboratory. The stockroom staff is friendly and helpful, but they do not have time to clean up after everyone. After each lab, the counters, floors, sinks and balances should be clean, stools well stacked in the closet, equipment in its proper location, and chemical waste disposed of in the correct container. All students in a section will be held accountable for cleaning up the lab, regardless of who made any messes. The lab will be clean when you come in, so please show consideration for your colleagues by leaving it in *better* condition than when you arrived.

Attendance

Your regular attendance in lecture highly encouraged and laboratory is MANDATORY. Class attendance is a critical component of the learning process. Lectures will be recorded and posted on the Canvas website, however, the pace of the class during the summer means that waiting until recorded lectures are posted may cause you to fall behind. You also miss important opportunities to ask questions and participate more fully in the learning process. Class meetings start on the half hour. Conversations should end at that time, and you should be prepared to commence taking notes and working on practice problems. Every

attempt should be made to arrive on time to minimize disruptions to the class. All students should bring a calculator and be prepared to work on problems in class.

Lab attendance is mandatory although it is understood that illnesses and emergencies do occur, please notify the instructor as soon as possible if you must miss a lab. There are typically no make-ups for lab, but in the case of illness or other serious circumstances, see the instructor for possible reassignment or partial credit options. A student who receives an "incomplete" rating on three or more lab activities will receive a grade of F for the laboratory course. Completion of a lab activity requires attendance of the lab session and submission of a lab report.

Course Policies

Re-evaluation of Graded Work

If you believe that your work has been graded incorrectly, please attach a brief note explaining the suspected error and submit it to me within two weeks of the day it was returned to the class. Do not write on any work that you are submitting for a re-grade. If you are comparing your graded materials with that of other students, both your work and that of your colleague must be submitted together for consideration. The entire submission will be re-evaluated, and the score may be adjusted up, down, or not at all.

Drops, Withdrawals, and Incompletes

Please be aware, it is the students' responsibility to drop any course that they do not intend to complete and accept a grade. Last date to drop this course without a 'W' is 06/19/2023, last day to drop with 'W' is 07/11/2023. The instructor may drop any student enrolled in a course that is not present or has not made prior arrangements with the instructor by the second class roll call.

Safety and General Information

Laboratory Safety

Safety in the laboratory is of primary importance. While in the laboratory, you must be appropriately dressed in long pants and closed-toed shoes. Backpacks and other loose articles must be stored in the cubbies provided, not on the floor. If you have long hair, it must be tied back. When anyone in class is working on chemistry, everyone must be wearing safety goggles. These may be worn over prescription glasses. Food and drink are strictly prohibited in lab. More complete safety instructions will be given to you in lab.

Emergency Information

In case of natural disasters, emergencies, or fires, we may need to evacuate Bech Hall. In the event of an evacuation, turn off any flame or heat source you are using and exit the building quickly and orderly. Do not stop for personal items. Find the nearest exit for the building and exit the building. (Bech Hall is a circular building with 2 exits.) Assemble in the parking lot area behind Bech until your instructor

takes roll and provides you with instructions. In case of an earthquake, hide under the desk or otherwise seek cover from falling overhead objects. Brace yourselves and hold on for the duration of the quake. Once the quaking has stopped, quickly exit the building. In case of a major chemical spill or if the chemical spill alarm is triggered, leave everything and evacuate the building. During a power outage, Bech Hall can be extremely dark. Remain calm and minimize your movement while your eyes adjust and flashlights and glowsticks are located for you. In the event of an evacuation, turn off any flame or heat source you are using and go to the parking lot behind Bech hall. This is our designated assembly area. Wait here, as your instructor will take roll. Copies of the red *Emergency Preparedness Handbook* are posted throughout the building and have more detailed information and procedures for most imaginable emergencies. Any type of emergency can be reported to the District Police Dispatcher at (707) 527-1000.

Accommodations for Students with Disabilities

If you need disability-related accommodations for this class, such as a note taker, test-taking services, special furniture, etc., please provide the authorization letter from the Disability Resources Department (DRD) to your instructor as soon as possible. You may also speak with me privately during office hours about your accommodations. Please fill out any paperwork for testing accommodations in advance of the exam, and keep me informed of what you need. I am happy to provide accommodations, but I do appreciate having a few days' advance notice. If you do not have authorization from DRD, contact the office directly (527-4278).

Chem 3A/3AL Class Calendar Summer 2023
Tentative

Week	Day	Date	Lecture Topics	Laboratory
1	M	6/12	Intro/ Ch. 1	
	T	6/13	Ch. 1: Chemical Foundations	Intro to CHEM 3AL. Excel Training.
	W	6/14	Ch. 2: Atoms, Molecules and Ions	Safety Training. Locker Check-in.
	Th	6/15	Ch. 3: Stoichiometry	Lab 1 : Measurements and Density
2	M	6/19	Juneteenth (no classes)	
	T	6/20	Ch. 3/ Ch. 4	Lab 2 : Empirical Formula of a Hydrate
	W	6/21	Ch. 4: Reactions/Solutions	Lab 3 : Estimation of Avogadro's Number
	Th	6/22	Ch. 5/review	Lab 4 : Stoichiometry of Chemical Reactions
3	M	6/26	Exam 1	
	T	6/27	Ch. 5: Gases	Lab 5 : Synthesis of CuSO ₄ 5H ₂ O
	W	6/28	Ch. 5: Gases/Ch. 6	Lab 6 : Gases: Density and Number Density
	Th	6/29	Ch. 6: Thermochemistry/Ch. 7	Lab 7 : Thermochemistry: Heat Capacities
4	M	7/3	Ch. 7: Atomic Structure	
	T	7/4	Independence Day	
	W	7/5	(Ch. 8)/review	TBA
	Th	7/6	Exam 2	Lab 8 : Thermochemistry: Hess's Law
5	M	7/10	Ch. 8: Bonding	
	T	7/11	Ch. 8/Ch. 9	Lab 10 : Atomic Spectroscopy
	W	7/12	Ch. 9: Orbitals	Lab 11 : Lewis Dot Diagrams and VSEPR
	Th	7/13	Ch. 10: Liquids & Solids	Lab 12 : Titration of Diprotic Acid
6	M	7/17	Ch. 10/review	
	T	7/18	Exam 3	Lab 13 : IMF/Clean up
	W	7/19	Final Review	TBA
	Th	7/20	Final Exam	TBA