

# Chem 1A, General Chemistry

# Fall 2017 Course Syllabus

	Lecture	Lab lecture	Lab
Sect 2869	Tu/Th 12-1:30p, Bech 1999	Tu 2-3p, Bech 1910	Tu 3-6p, Bech 1980
Sect 2870	Tu/Th 12-1:30p, Bech 1999	Th 2-3p, Bech 1910	Th 3-6p, Bech 1980

**Course Description** - Chem 1A is the first semester of a one year program of general chemistry. The course covers general principles of chemistry, including atomic theory, bonding, stoichiometry, kinetic theory of gases, properties of mixtures, the periodic table, and thermochemistry. Click [here](#) to see the current course outline

**Prerequisites** - Course completion of Chem 42 and completion of Math 155 or higher (V2); OR Course Completion of Chem 42 and Qualifying Test Score in Math or two years of high school algebra or equivalent. Students who think they may be ready for Chem 1A without completing Chem 42 should take the Chemistry Diagnostic Test and complete and return the Chemistry Diagnostic Review form to the Student Success and Assessment Services Office. After the Chemistry Department's review and approval, the Admission and Records Office will lift the prerequisite block and notify the student through the portal.

**Student Learning Outcomes** - After successful completion of this course, students will be able to:

1. Describe matter, its transformations and corresponding energy changes according to prevailing chemical theories.
2. Collect accurate data in the laboratory, & analyze with methods such as graphical & error analysis.
3. Communicate the findings of laboratory work in written laboratory reports.

## Instructor Contact - Dr. Robert Jackson

**Email:** [rjackson@santarosa.edu](mailto:rjackson@santarosa.edu) (the best way to reach me if you can wait a bit for a reply).

**Live office hrs:** Tu/Th 1:30-2p, Bech 1970; **Text:** 707-583-9556 (you must include area code)

**Online office hrs:** M/W 8-9p (<https://hangouts.google.com/call/zabz3paivfeipdcq4io56wcuwae> )

**Live audio or video call at (most) times:** [rjackson@santarosa.edu](mailto:rjackson@santarosa.edu) on Facetime or Google Hangouts.

## Course Materials and Resources

- Text: Chemistry: The Molecular Nature of Matter and Change, 8th ed., Silberberg and Amateis (McGraw-Hill); available in hardback and loose-leaf formats. 7th ed. is OK too.
- Optional: “Connect” online homework (Mac or PC, access code bundled with NEW textbook)
- The course Canvas site ([canvas.santarosa.edu](https://canvas.santarosa.edu)). All assignments and due dates are posted there.
- Microsoft Excel and Word or equivalent for writing lab reports (free online versions are OK)
- A pdf reader to view documents downloaded from the course Canvas site
- Custom lab manual (Chem 1A, Fall-2017, available only at the JC bookstore)
- Scientific lab notebook with self-copying pages (using one you already have is OK)
- Scientific calculator (bring to all classes, labs, and exams)
- A periodic table (bring to all classes and labs). A copy is available on the course Canvas site.

**Course Grading** - Listed below are weighting factors for the components that make up your grade:

- Midterm exams (3)            40% of total grade            A = 88% and above
- Final exam                    15% of total grade            B = 76 – 88%
- Labs                            25% of total grade            C = 65 – 76%
- Homework                    10% of total grade            D = 50 – 65%
- Quizzes and Essays        10% of total grade            F < 50%

Boundaries between letter grades are guidelines. Borderline grades will be decided, up or down, based on academic growth, initiative, attendance, punctuality, participation and interest shown in labs, lectures, and assignments. Grades are earned by the student, not assigned by the instructor.

**Midterm Exams** - Three midterm exams will be given on the dates listed in the class schedule (see last page of the syllabus or on the course Canvas site). Exams are closed book. A periodic table is provided and you may bring one 8-½ x11 sheet of notes, front and back. Bring your own calculator. Phones cannot be used as a calculator nor can a calculator be shared with another student.

**Final exam** - The final exam will have a portion on new material, introduced after the third midterm, plus a comprehensive portion covering material presented throughout the semester. The final exam will be given during the time designated by the College. The final exam will be similar in format to the midterms, but approximately 1.5 times longer. Again, bring your own calculator. Phones cannot be used as a calculator nor can a calculator be shared with another student.

**Lab** - Lab meets at the time shown at the top of p.1 of the syllabus. The lab to be conducted each week is given in the course schedule (see the last page of syllabus, or the course Canvas site). Read each lab thoroughly before coming to lab. Each lab grade includes the following:

1. Participation (i.e. you came to lab prepared and you completed the lab in a timely manner)
2. Completeness of your lab notebook (notebook grade criteria are discussed during the first lab).
3. The lab report
4. The pre-lab and post-lab questions from the lab manual (where applicable)

Please do not leave lab until I check your lab notebook. If your notebook is incomplete, you will be able to correct it before lab ends. Lab reports are due, **in hardcopy form only**, at the beginning of the following lab session.

Lab is a key part of the chemistry learning experience. It is important that you attend and complete the assigned work for each lab. Failing to complete the assigned work for three or more labs will result in a penalty of at least one letter grade for the course, in addition to the points lost for not completing the lab. Also, see below for attendance and late lab policies.

**Attendance policy** - This class follows the [SRJC attendance policy](#). As the policy indicates: “A student may be dropped from any class when that student's absences exceed ten percent (10%) of the total hours of class time.” Lab represents more than half of the class time each week. Failing to attend lab, particularly early in the semester, will likely cause you to exceed the 10% absence threshold, at which point you may be dropped from the class. Confirmed illness or unavoidable absence will be handled on a case by case basis. Please contact your lab instructor in class or by email if you must miss a lab.

**Lab safety and Lab late attendance** - Labs involve safety hazards and complicated procedures. Your knowledge of lab procedures and safety hazards specific to each lab ensures that you can conduct the lab properly and safely. Procedure details and safety instructions for each lab are presented in lab lecture. For your own safety, and the safety of those around you, **you will not be admitted to lab if you are more than 10 minutes late for the start of lab lecture.**

Safety glasses and other protective equipment are available at all times and must be worn as directed. Please follow the lab dress code, which requires closed-toe shoes, shirts and tops that completely cover the torso, and pants or skirts or dresses that cover the knee. Students who

come improperly dressed for lab will be required to obtain additional protective equipment from the stockroom at the student's expense.

**Homework** - Homework problems are assigned each week and are to be completed by the due date through the online homework web portal. Instructions for accessing online homework will be given in class. Homework problems are chosen to help you apply concepts, tools, and terminology that are tested on exams. Homework is 10% of your grade and will help you immensely at exam time if you complete each homework assignment on time.

**Class Canvas site**- Important information is posted on the class Canvas site. Login to view assignments, lecture notes, special readings, worksheets, schedules, and announcements. Some assignments will be turned in online using Canvas (to be explained in class).

**Late Work Policy** - Late work is not accepted except in unusual and unavoidable circumstances. Please work with your instructor if those circumstances arise. This policy applies to all lab reports, essays, online quizzes, and online homework.

**Make-up policy** - There will be no make-ups for the midterm or final exams. Confirmed illness or unavoidable absence will be handled on a case by case basis. Labs cannot be made up unless there is space in another lab section that is conducting the same experiment and you have permission of the lab instructor. Please contact your instructor if you must miss an exam or lab.

**Incomplete** - If you are unable to complete academic work for unforeseeable, emergency or justifiable reasons within the last few weeks of the end of the term, you may petition to have an incomplete (I) recorded on your academic record. See the [policy on grading](#) for details.

**Accommodation for Students with Disabilities** - The instructor will work with you to meet your needs and to maintain confidentiality. Please register with the Disabled Resources Department (DRD) then give your instructor the required Academic Accommodation Authorization letter. Contact the DRD office, Bertolini, 3<sup>rd</sup> floor; (707) 527-4278; Email [disabilityinfo@santarosa.edu](mailto:disabilityinfo@santarosa.edu); Website: [drd.santarosa.edu](http://drd.santarosa.edu).

**Emergency Evacuation Plan** - If an emergency occurs during class that requires evacuation of the building, please leave the class immediately, but calmly. Our class will assemble in the area between Bech and Shuhaw to make sure everyone gets out of the building safely and to receive further instructions. If you are a student with a disability who may need assistance in an evacuation, please see your instructor as soon as possible to discuss accommodations during an evacuation plan.

**Academic Integrity and Student Conduct** - Students and instructors are expected to comply with the Academic Integrity [policy](#) and [procedures](#). Students must comply with the [Student Code of Conduct](#). Please adhere to the following class specific academic and conduct policies:

- You are encouraged to work with other students as benefits you, but the final work product you turn in must always be your own. When duplicate work is detected, the work from all students involved will be not be accepted.
- Keep phones and other communication devices on silent during lecture and lab classes.
- If you must text or make a call, or if you must leave the lecture class for another reason, please exit the room quietly through the rear door, and return quietly through the rear door.

- Lectures include designated discussion time; you are encouraged to engage in on-topic discussion with other students during those times. Questions for the instructor are welcome any time. But side discussions are rude distractions for students around you and for the instructor. Those engaging in side discussions during lecture will be asked to leave.
- If you arrive late to lecture, please enter quietly through the rear door. If you know you must leave lecture early, please let your instructor know before class begins and then sit near the door.
- The lab lecture room (Bech 1910) has no rear door, so entering late or leaving early is a major distraction. Please do not enter lab lecture late or leave early except in truly unavoidable circumstances. As indicated in the Lab Safety and Late Lab Attendance policy, students more than 10 minutes late to lab lecture will not be admitted and cannot attend lab.
- Please understand that I cannot allow you to use a phone or other communication device as a calculator in an exam, nor can I allow you to share a calculator with another student in an exam.

**Tutorial Center** - Help is always available during office hours. You can also schedule a tutor at the Tutorial Center, Doyle Library, First Floor, Room 4251. Tutors will meet with you individually, or you can schedule tutoring sessions with another student. See the [Tutorial Center webpage](#).

### **Study Tips**

- Chemistry, like most things, takes practice. Get the practice you need by completing all assignments, including homework problems, worksheets, pre-labs, lab write-ups, practice exams.
- Keep current. In this class, material comes at you in large quantities each week. Much of the material after the first midterm exam will likely be new to you. Once you fall behind, catching up is very hard.
- Use the lecture notes posted on the class Canvas site. Lecture notes are posted before each class.
- Use the homework each week as an opportunity to find the topics and concepts that you don't understand. Get help for things you don't grasp right away. Don't wait until exam week.
- Labs are designed to demonstrate concepts covered in the lecture portion of the class. The calculations assigned for each lab, plus the lab reports, will help you learn these concepts. Use your time in lab effectively, as well as your time after lab working on calculations and reports.

**Course schedule.** The instructor may alter dates or assignments in class.

Wk		Lecture topics	Lab schedule
1	Aug-22	Intro to the class, math review	Safety training; unit conversions
	Aug-24	Matter, atoms, formulas, atomic theory	
2	Aug-29	Structure of the atom, atomic mass, the mole	Lab # 1 Measurements and Density
	Aug-31	Dalton's atomic theory: ionic compounds	
3	Sep-05	Types of bonding; molecular compounds	Problem solving session
	Sep-07	Chemical equations, stoichiometry	
4	Sep-12	Solutions, precipitation reactions	Lab #2 Avogadro's number
	Sep-14	Molarity, solution stoichiometry, acids/bases	
5	Sep-19	Oxidation-reduction reactions	Lab #3 Empirical formula of a compound
	Sep-21	<b>Midterm 1.</b>	
6	Sep-26	Gas comp., kinetic theory, ideal gases	Lab #4 Synthesis of Sr iodate
	Sep-28	Disc. historical view of gases, Ideal gas calculations, stoichiometry of gas reactions	
7	Oct-03	Gas density, rms molecular velocity, effusion, diffusion, non-ideal gases	Lab #5 Six solutions
	Oct-05	Heat, energy, heat transfer	
8	Oct-10	Calorimetry, Rumford paper discussion	Lab #6 Determination of the ideal gas constant, R
	Oct-12	First law of thermodynamics, enthalpy	
9	Oct-17	Hess's law, heats of formation	Lab #7 Measuring heat capacity
	Oct-19	Energy, EM waves, quantized EM energy	
10	Oct-24	<b>Midterm 2.</b>	Lab #8 Hess's law
	Oct-26	Quantum energy, the quantum electron	
11	Oct-31	The quantum atom, electron energy levels	Lab #9 Atomic spectrum of the hydrogen atom
	Nov-02	Electron configurations, periodic trends	
12	Nov-07	Lewis structures	Lab #10 Lewis structures and VSEPR theory
	Nov-09	Formal charges on atoms, VSEPR theory	
13	Nov-14	Bond energy/length, polarity, resonance	Lab #11 Analysis of aspirin
	Nov-16	Valence bond theory	
14	Nov-21	Valence bond theory, cont'd	Tu: Problem solving session Th: No lab (Thanksgiving)
	Nov-23	Thanksgiving Day, no class	
15	Nov-28	<b>Midterm 3.</b>	Lab #12 Analysis of a diprotic acid
	Nov-30	Intermolecular forces, phase diagrams	
16	Dec-05	Molecular orbital theory	Lab #13 Intermolecular forces
	Dec-07	MO theory cont'd	
17	Dec-12	Gas solubility, vapor pressure, Raoult's law	Checkout
	Dec-14	Colligative properties of solutions	
	Dec-21	<b>Final Exam, 10a-12:45p</b>	