Chem 1A, General Chemistry   Spring 2020 Course Syllabus

	Lecture	Lab lecture	Lab
Sect 4327	Tu/Th 3-4:20p, Bech 1901	Tu 11-11:50, Bech 1910	Tu 12-2:50p, Bech 1980
Sect 5530	Tu/Th 3-4:20p, Bech 1901	Tu 11-11:50, Bech 1999	Th 12-2:50p, 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
Live office hrs: Tu/Th 4:25-4:50, Bech 1916
Online office hrs: M/W 8-9p on Zoom, https://cccconfer.zoom.us/my/jackson.chem1a
Email: rjackson@santarosa.edu

Course Materials and Resources
- Text: Chemistry, 10th ed., Zumdahl, Zumdahl, and DeCoste (Cengage); available in hardback, loose-leaf, and e-book formats. No online homework access. Library QD 31.2 C44 C5 2018.
- Custom lab manual (Chem 1A, Spring-2020, available only at the JC bookstore)
- Chemistry lab goggles and apron (available from the JC bookstore and elsewhere).
- The course Canvas site (canvas.santarosa.edu). All assignments and due dates are posted there.
- Google Sheets and Docs, or equivalent, for writing lab reports (Microsoft Excel and Word OK)
- A pdf reader to view documents downloaded from the course Canvas site
- 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
- Midterm exams (2)   25.7% of total grade   A = 89% and above
- Final exam   19.3% of total grade   B = 78 – 89%
- Labs (12)   25% of total grade   C = 67 – 78%
- Lab exam   7% of total grade   D = 55 – 67%
- Quizzes (12)   23% of total grade   F < 55%

Midterm Exams - Two 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.

Final exam - The final exam will have a portion on new material, introduced after the second 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 is similar in format to the midterms, but about 1.5 times longer. Again, bring your own calculator; phones and calculator sharing are not permitted. You may bring one 8-½ x11" sheet of notes, front and back.

Lab - Lab meets at the time shown at the top of p.1. 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 all assigned work for more than two 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.

Lab exam – One of the labs during the semester will be a lab exam. This lab will involve quantitative analysis of an unknown sample. You will be required to produce a more detailed formal lab report than will be required in all other labs. A portion of your grade will be determined by how closely your results match the known concentration of the sample. More details on the lab exam will be provided in class.

Quizzes – A quiz will be given online most weeks; no quiz will be given the week after each of the three midterm exams. There will be 12 quizzes total; each quiz will be taken through the Canvas course portal. In most cases, quizzes will be due before class on Tuesday and will test your knowledge of the material covered in class the previous week. For the first quiz, you will have 1 try, but for each of the subsequent quizzes, you will have 3 tries. If you decide to try a quiz again, your final score will be the highest of your tries. Be sure to keep track of which quiz problems you answer correctly before you try a quiz again. Although Canvas indicates which quiz problems you answered correctly after each try, it doesn't carry over your correct answers into the next try. Hence, you will need to enter an answer for every quiz problem in each try, including correct answers from the previous try. You may work with other students, or get help from the instructor or from a tutor, but **the answers you submit must be your own**..

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 by email or in person 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**.

You must purchase lab safety glasses and a protective apron before the first lab. They 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.

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.

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, worksheets, and quizzes.

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.

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.

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 class 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, 3rd floor; (707) 527-4278; Email disabilityinfo@santarosa.edu; Website: drd.santarosa.edu. Please note that if your accommodation grants you extra time on exams and/or a quiet environment in which to take exams, you must arrange at least a week in advance to take your exams in the DRD testing center.

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.

Tutorial Center - Help is always available during office hours. You can also contact me by video chat, email, or text when you need help (see contact info on p. 1). If you need longer term, continuous help, you can also use the Tutorial Center in the Doyle Library, First Floor, Room 4251. Tutors will meet with you individually or 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 quiz problems, worksheets, pre-labs, lab reports, and 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	Date	Lecture topics	Lab schedule
1	Jan-14	Intro to the class, matter on the atomic scale	Math review; safety discussion
	Jan-16	Atoms, atomic theory	
2	Jan-21	No Class, MLK birthday	Optional problem solving session
	Jan-23	Structure of the atom, atomic mass, the mole	
3	Jan-28	Composition, formulas, Dalton's atomic theory	Lab #1: Measurement and density
	Jan-30	Periodic table, ionic bonding, Coulomb's law	
4	Feb-04	Naming, chemical equations	Lab #2: Formula of a hydrate
	Feb-06	Stoichiometry, percent yield, molarity	
5	Feb-11	Precipitations, ionic equations, dilution eqn	Lab #3: Avogadro's constant
	Feb-13	No Class, Professional development day	No lab
6	Feb-18	Acid-base reactions, solution stoichiometry	Problem solving session
	Feb-20	Oxidation-reduction reactions	Lab #3: Avogadro's constant
7	Feb-25	**Midterm 1**	Lab #4: Synthesis of copper (II) sulfate monohydrate
	Feb-27	Comp. of gases, kinetic theory, ideal gases	
8	Mar-03	Ideal gas calculations, historical view of gases	Lab #5: Solutions and conductivity
	Mar-05	Gas stoich, partial pressure, non-ideal gases	
9	Mar-10	Gas density/velocity, Heat, energy, heat xfer	Lab #6: Determination of the ideal gas constant
	Mar-12	Heat transfer with state change, calorimetry	
10	Mar-24	First law of thermodynamics, enthalpy	Lab #7: Measuring heat capacity by calorimetry
	Mar-26	Enthalpy change by calorimetry, Hess's law	
11	Mar-31	Heat of formation; electromagnetic waves	Lab #8: Hess's Llaw: Neutralization of citric acid
	Apr-02	Quantized energy; Bohr model, quantum atom	
12	Apr-07	Electron energy levels in the atom	Lab #9: Lab exam, Molar mass of a diprotic acid
	Apr-09	Electron configurations & the periodic table	
13	Apr-14	**Midterm 2**	Lab #10, Atomic spectrum of hydrogen
	Apr-16	Lewis structures	
14	Apr-21	Formal charges, bond polarity, resonance	Tu lab: Lab #11: Lewis/VSEPR
	Apr-23	Bond energies, VSEPR theory	
15	Apr-28	VSEPR theory cont'd, molecular polarity	Tu lab: Lab #12: Spectroscopy
	Apr-30	Intermolecular forces in pure liquids	
16	May-05	Valence bond theory introduction	Lab #13 Intermolecular forces in liquids
	May-07	Valence bond theory, cont'd	
17	May-12	Solution intermolecular forces, phase diagrams	Checkout
	May-14	Structure of solids	
	May-21	**Final Exam, 10a-12:45p**	