

CHEMISTRY 42: INTRODUCTORY GENERAL CHEMISTRY

Spring 2019

Lecturer: Janice Crowley

Lecture Room: _____ Room 1910 _____ E-mail: jcrowley@santarosa.edu

Office: Room 1916

Office hours: Tuesday & Thursday 3:30 – 4:15 pm January through March 14

Tuesdays only: 10:00 am until 1:00 pm March 26 through May 14

In addition to my office hours, there is a wonderful tutorial center (Room 4251 in Doyle Library) that I recommend you utilize if you have never had chemistry or it has been longer than 2 years.

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, I reserve the right to modify, supplement and make changes as the course needs arises.

OVERVIEW

This course is a basic introductory chemistry course for students who are preparing for either one year of general chemistry (Chem 1A & Chem 1B) or for Chem 8 (one semester organic chemistry course).

STUDENT OBJECTIVES (as stated in the official Course outline of Record of SRJC.)

Upon completion of this course, the student will be able to:

1. Solve problems involving fundamental processes in chemistry, including basic atomic theory, structure and bonding, chemical reactions, equilibrium, and the various forms of matter.
2. Demonstrate a basic understanding of the above fundamental processes in chemistry and how the scientific method was used to develop the theories behind these processes.
3. Interpret and utilize the vocabulary and nomenclature that is specific to a basic level of general chemistry.
4. Follow fundamental safety procedures in a lab environment.
5. Perform simple chemical experiments and associated calculations efficiently and accurately.
6. Use fundamental processes in chemistry to investigate phenomena in the applied sciences.
7. Arrange, sort, and graphically represent chemical data.

STUDENT LEARNING OUTCOMES (as stated in the official Course outline of Record of SRJC.)

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

- 1.) Analyze basic quantitative problems in chemistry and apply them to real life situations.
- 2.) Correlate macroscopic properties of matter with its structure and behavior at the atomic scale.
- 3.) Communicate effectively using common chemical conventions and notation.
- 4.) Evaluate available information to plan, perform and interpret basic laboratory experiments.

TEACHING PHILOSOPHY

I have taught for over 25 years and have enjoyed working with students with different learning styles. Artists, historians, statisticians, scientists... have a proclivity toward certain learning styles in life. I have been fortunate to have had great science mentors in my life including my early years with my dad as an informal instructor. I believe my college chemistry students can experience great success if they follow simple guidelines which are aimed at reaching every type of student learner. Chemistry is all around us and the relevancy of chemistry in our everyday life is probably more critical now than ever

before. I hope you find the terrific sense of wonder in our world around us and that you can use this knowledge and learning to make better informed decisions in your life in addition to using these credit hours toward your required graduation requirements.

GENERAL COURSE POLICIES:

1. Prerequisites: Course completion of MATH 155 or two years of high school algebra or equivalent.
2. Lecture and Lab time:
Section _0374_: Lecture: Bech Hall 1910, Tuesday and Thursday from 4:30 – 6:00 pm
Laboratory: Bech Hall 1960, Thursday from 6:30 to 9:30 pm

3. Required Course Materials:

Chemistry 42 Survivor Guide: A comprehensive set of notes and assignment for success in an introductory chemistry course. available at the SRJC book store. By J.P. Crowley and John C. Branca.

Recommended Text book: Introductory Chemistry by Russo and Silver 5th edition

Scientific or graphing calculator. No phones or other devices are permitted for use on exams.

Standard Laboratory Notebook (I have a sample copy for you to view).

Laboratory Manual CHEM 42 (available at the SRJC bookstore only). Protective eyewear and apron (will be issued to you).

Long pants or other clothing that covers the legs completely and closed toe shoes.

4. **Attendance:** Attendance is important and expected of all students. In fact, attendance is so vital for your student learning that I have incorporated points into your grade based on your daily quizzes and participation. Please do not miss or be consistently late to class. The first five minutes are an incredible overview of what you will be learning including quizzes and demos. To be fair to all students, there will not be any make-ups on labs or exams for any reason other than a thoroughly explained and correctly dated document from a medical doctor for reasons you were not able to attend lab or exam. If you miss a quiz it is a zero and no make-ups. In addition, since this is a lab based course, missing more than 3 labs will result in an “F” for the entire course, regardless of the student’s performance in the class (department policy).
5. **Standards of Conduct:** All students are expected to do their own work. I applaud collaboration, but at the end of the group study it is the responsibility of the individual to turn in their own work that is not a copy in any sense of other students. Cheating, or anything that can be construed as cheating will result in no credit given, or even worse.
No inter-student communication is allowed during exams. Any comments or questions you may have, must be directed toward the instructor by raising your hand and the instructor acknowledging you. No eating food in the classroom.
Laboratory experiments will often be done in pairs, but each student is expected to record his or her own data. For example, it is not acceptable for one partner to take notes and the other partner to copy their results at the end of the lab.
To ensure an effective learning experience: use of cell phones in class and in lab is prohibited. Refrain from talking while lecturing is taking place because it is a distraction from learning. Lap tops are not necessary for this course and should not be used.

Do not ask me for extra credit. Do the appropriate recommended study tips I have stated. Violation of appropriate student behavior may result in my giving the student 2 class days dismissal with zero credit for what is covered during the dismissal days. That includes, quizzes, tests, lab reports...

Student Conduct: The Sonoma County Junior College District supports a safe, productive learning environment to foster intellectual curiosity, integrity and accomplishment as defined in the District Mission and Goals. The District holds that students shall conduct themselves in a manner which reflects their awareness of common standards of decency and the rights of others. Interference with the District's mission, objectives, or community life shall be cause for disciplinary action. Policy 8.2.8: The full policy may be found here. Procedure 8.2.8P: The full procedure may be found here. Also, refer to policy 3.11 and 3.11 P for academic dishonesty.

The following link will take you to the above policy and procedures:

<https://www.boarddocs.com/ca/santarosa/Board.nsf/Public?open&id=policies#>

6. **Reading Assignments, Pencast Assignments, and Animation Assignments:** Any additional assignment be it homework, pencast viewing or animation viewing are an important part of learning in this course. To attain the greatest success in this course, you should always do these recommended assignments the same day they are assigned after you have actively reworked your notes. These assignments are typically found in Canvas.
7. **Homework Assignments:** Chemistry is a vertical subject that is best learned in appropriate chunks. As an instructor I have gone to great lengths to not overburden you with an inordinate amount of information per lecture. Therefore, it is imperative that you complete the recommended homework assignments before the next class period to avoid gaps in understanding. Studying on a daily basis and not cramming increases your ability to retain long-term information and perform more successfully on comprehensive final exams. I will be providing answers to almost all your written assignments so you can double check your work immediately and know whether you are studying and learning what you need to know for proper preparation for the daily quizzes and the exams. Please note that I use Bloom's Taxonomy of questions on the exam which means I will ask recall questions, application questions, and higher order critical thinking questions. Cramming will not enable you to perform at the higher level.
8. **Laboratory:** Laboratory work is designed to give you a hands-on experience with the chemical concepts. Before lab, read the experiment and do a pre-lab write up (use blue or black ink only) which includes writing a short 1 -2 sentence purpose of the lab, a brief but lucid write up of the procedures. It also includes answering any pre-lab questions. This is due BOL (at the beginning of the lab).
Be sure to arrive on time in appropriate safety approved clothing. No food or drink in the lab. Follow all lab safety rules. Late lab are marked down by 20 % of the value of the lab report if turned in within one week after the due date. Lab reports received later will receive a zero. Please do not miss labs because a zero has at a minimum of a 10 % effect on your overall lab grade. Zeroes are given, there are no incomplete (I) grades given for missing labs.

I.O.W. TO RECEIVE A PASSING GRADE IN THE COURSE, PASSING WORK MUST BE DONE IN BOTH THE LAB AND LECTURE PORTIONS. IF YOU MISS MORE THAN 3 LABS or FAIL TO TURN IN 4 LAB REPORTS, YOU WILL NOT PASS THE COURSE (department policy).

Be sure to record all your lab work in your lab notebook in pen. It is an important part of the lab experience and is the permanent record of what you have observed and done in the lab. Do not write down your work in your lab manual or other paper. Record work and observations directly into lab notebook - failure to comply may result in penalty points or zero credit. You will be graded on the organization, quality and maintenance of your lab notebook.

9. **Exams:** There will be 4 exams and a final comprehensive exam in the course. No make-up exams will be given. An excused absence from an exam will be granted only if proper documentation (a thoroughly explained and correctly dated document from a medical doctor for reasons for you not being able to attend lab or exam). I will discuss make-up work only after having received proper documentation from the individual during my office hours.
In general, if you miss an exam you will receive zero points and no make - up. However, if you have a medical condition that requires you to miss an exam, you need to present written documentation from the doctor on their letterhead that explains the illness that prevented you from coming to class to take the exam and has the date and time you were being treated. If I do not receive the medical note from the physician within two weeks of the absence, it will then be considered an unexcused absence and no make-up points. Routine medical checkups do not count for a reason to miss class.
10. **Accommodations for students with learning disabilities.** If you provide the appropriate authorization letter from the Disability Resources Department to me during my office hours a week before exams, you will be given appropriate accommodations as per our discussion.
11. **Re-evaluation of Graded Work:** Graded work may be submitted for re-evaluation within one class period from when it was received. In comparing ones graded materials with that of fellow students, any difference must be confirmed by submission of both students' work for consideration. The document in question must be submitted with written detailed rationale for any changes requested. Based on this rationale, the entire assignment will be thoroughly evaluated. This re-evaluation can result in positive, negative, or no change to the original grade.
12. **Grading:** Grades will be broken down as follows:

<u>Factors:</u>	1,000 points total
Lab Grade:	220 Cannot miss more than 3 lab days or F for class
4 Exams:	500
Participation, Assignments & Quizzes:	140
Final Cumulative Exam:	140

Final course letter grade will correspond to the following percentages:

A = 90 % or better	900 points – 1,000 points
B = 78 % - 89 %	780 points – 899 points
C = 66 % - 77 %	660 points – 779 points
D = 54 % - 65 %	540 points – 659 points
F = below 54 %	below 540 points

TOPICS AND SCOPE:

- 1) Fundamental principles of the composition of matter (atoms, matter and the mole)
- 2) Physical and chemical changes, measurement and significant figures, unit conversions
- 3) Atomic and molecular structure, nuclear chemistry
- 4) Bonding, naming and oxidation numbers
- 5) Formulas, formula writing, molar mass
- 6) Chemical reactions and kinetics
- 7) Solution chemistry and solids, liquids and gases
- 8) Acids, bases, salts, and equilibrium
- 9) pH, electrochemistry, Lewis structures and intermolecular forces
- 10) Gas Laws, basic stoichiometry, yield calculations, lab theory and techniques

Tentative Lab Schedule:

Week #	Date	Lab Title/Topic
1	1/17	Lab Safety and Chem 42 Intro
2	1/24	Lab Intro/Safety
3	1/31	Dimensional Analysis and Locker Check
4	2/7	Measurements Lab NOTE: 2/14 lab does not meet PDA
5	2/21	Separation of a Ternary Mixture Lab
6	2/28	Atoms and the Electromagnetic Spectrum
7	3/7	Ionic and Molecular Compounds
8	3/14	Lewis Structures
9	3/28	Observing Chemical Reactions
10	4/4	Electrochemistry and Activity Series
11	4/11	Synthesis of Indigo Dye
12	4/18	Gas Laws
13	4/25	Preparation and Concentration of a Solution & Hydrometer Lab
14	5/2	Preparation and Concentration of a Solution week 2
15	5/9	Acetic Acid Titration
16	5/16	LAB CHECK OUT
17	5/21	Comprehensive Final Exam 4:00 – 6:45 pm

Exam dates:

Exam # 1: 02/05/2019

Exam # 2: 03/12/2019

Exam # 3: 04/16/2019

Exam # 4: 05/14/2019

Cumulative Final Exam: Tuesday, May 21, 2018 from 4:00pm - 6:45 p.m.

The Top 10 Reasons students are successful in chemistry.

1. They actively study (re-work notes and pencasts) the same day of lecture for that material [increased memory retention 90 -95 %]. Write their own test/quiz questions from that day's lecture.
2. They are focused in lecture. Their minds are actively thinking/analyzing/reflecting on what is being said and they are writing good notes and putting question marks next to material they may need further clarification.
3. They utilize the instructor provided resources – outline, pencasts, reading assignments, all homework... They focus on these without distractions such as receiving and making phone calls or text message or surfing the internet or doing this in front of a TV. Typically they study in the same, clutter free, and media free area. Note: However, some music is conducive to studying (music with good tempo and no lyrics) some music is not (in general - music with lyrics).
4. They DO the homework that pertains to the lecture after they have actively studied their notes from that lecture that day.
5. They are in class or at least on time, organized with all their materials needed (notes, paper, pen or pencil, calculator, reference sources such as periodic tables).
6. They come prepared to work effectively in study groups. They have done # 1-5 above and are ready to explain and ask clarifying questions from each other. They can easily find their resources because they are organized and have binders with proper tabs labeled...
7. They do not create gaps in their knowledge because they do # 1- 6 above. They incorporate constructive criticism into their study habits.
8. They start memorizing any material the instructor asked them to memorize right away and keep practicing. This helps them to have the basics needed to connect the dots to better understanding and comprehension of the material. They are prepared for daily quizzes.
9. They properly prepare for the final comprehensive exam by doing # 1-8 above, but they also start a more dedicated review on weekends by reworking previous material learned in preparation for the final. The week before they are less stressed than others because they did not procrastinate.
10. They clearly demonstrate with extra paper they used that they re-worked notes, wrote mock tests or practice quiz type questions from notes and pencasts before doing the homework. They only look at the answer key after they have worked the homework problem.

The above top ten list came mostly from my students who shared with me how they made exceptional grades in this course including A's on the comprehensive final exam.

Tentative SYLLABUS for Spring 2019 CHEM 42

Day	Date	Lecture Topics
T	1/15	Atoms, matter, mole, significant figures, structure of the atom.....
Th	1/17	Atoms, matter, mole, significant figures, structure of the atom.....
Su	1/20	Last day to register/add without instructor's signature or add code
T	1/22	PDA (no classes)
Th	1/24	Quantum numbers, Periodic Table...
Su	1/27	Last day to drop and be eligible for a refund
T	1/29	Atomic and ionic radius size, electronegativity...
Th	1/31	Oxidation numbers, bonding, naming, formula writing...
Su	2/3	Last day to drop class without a "W" symbol or add with add code
M	2/4	First Census Day
T	2/5	Exam 1 over units 1 – 4 and part of unit 5
Th	2/7	Percent composition, molar mass of compounds, empirical formula
T	2/12	Lewis Structures
Th	2/14	PDA
T	2/19	IMF
Th	2/21	IMF, Balancing Reactions
T	2/26	Balancing Reactions
Th	2/28	Oxidation numbers of elements in polyatomic ions
T	3/5	Redox and Electrochemistry
Th	3/7	Electrochemistry
T	3/12	Exam 2 over units, 5,6, 14, 15 & 16 SG
Th	3/14	Gas Laws
3/18	3/24	Spring Break
T	3/26	Stoichiometry
Th	3/28	Stoichiometry
T	4/2	Acids, Base & Salts
Th	4/4	Acids, Base & Salts
T	4/9	pH
Th	4/11	pH & Concentration problems % m/v, % v/v, $M_1V_1=M_2V_2$, $M_aV_a= M_bV_b$
T	4/16	Exam 3 Cumulative material, but primarily content 3/14 – 4/11
Th	4/18	Nuclear & Kinetics
Sat	4/21	the last day to drop class with a "W"
T	4/23	Kinetics & Antilog
Th	4/25	Equilibrium
T	4/30	Equilibrium
Th	5/2	Equilibrium Buffers
T	5/7	Buffers
Th	5/9	Naming Acids
T	5/14	Exam 4 Cumulative material, but primarily content 4/18 – 5/9
Th	5/16	Go over grades, review Q and A
T	5/21	Final Exam TIME: 4:00 am – 6:45 pm

For student privacy reasons: I do not give or discuss individual grades via email.

Please make a copy of this page, sign it and turn it into me by 01/15/2019 (First Day of Class – worth points)

Student signature: _____ Date: _____

Student printed name: _____

By signing above, I indicate my receipt and understanding of the syllabus, guidelines and calendar for Chemistry 42. This page, signed document and initialed items, is due January 15, 2019.

Place your initials by each sentence indicating you read and understand the statement.

_____ Research shows that material is best learned and retained if studying is done within 24 hours.

_____ To be successful in chemistry, it is highly recommended that I rework the notes from class and do my homework within 24 hours after each lecture.

_____ Focus in lecture leads to better understanding of concepts.

_____ SRJC guidelines for studying: it is recommended that I spend 3 hours studying outside of class for every hour I am in lecture. This means 9 hours studying outside of class per week for this course.

_____ Pencasts are good to watch right after learning the material and then again review before exam(s).

_____ There are 4 exams and a final exam. Each exam builds off previous material. Each exam gets progressively more difficult. There are no make-up exams.

_____ It is recommended that I copy my assignment pages before writing in them. Then complete the assignment in my study guide on the day it is recommended to complete the assignment. Then use the blank copies of the assignment pages as another assignment for me to do the weekend before the exam as a good practice.

_____ I understand that I can lose no more than 100 points to get an A in the class. I can lose 220 points to get a B in the class. I can lose 340 points to get a C in the class. I can lose 460 points to get a D in the class. If I lose more than 460 points, I get an F.

_____ I understand that I do not have permission to talk in class unless I raise my hand, and I am acknowledged by the instructor to ask my question.

_____ I understand the times for the office hours of my instructor and I am aware of the tutorial center hours in Doyle Library.

_____ I understand the entire syllabus including the rules of student behavior in class and in the laboratory.