

Lecturer: Janice Crowley

Lecture Room: _____ Room 1901 _____ E-mail: jcrowley@santarosa.edu

Office: Room 1916

Lab Room: Room 1980

Office hours: Tuesday 2:00 – 4:00 p.m. Thursday 2:00 – 4:00 p.m.

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 you struggled with it or it has been longer than 2 years since you took it.

OVERVIEW

This course is a basic introductory chemistry course for students who are preparing for either one year of general chemistry (Chem 1AB or Chem 4B) 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 30 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 _5286_: Lecture: Bech Hall 1901, Tuesday and Thursday from 4:30 – 6:00 pm
Laboratory: Bech Hall 1980, 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 Nivaldo J. Tro

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

Standard Laboratory Notebook available in the SRJC bookstore.

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.

Recommendation: See me after class if you are not sure what additional text would be appropriate.

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 attendance. 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 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 for you not being able to attend lab or exam.*** 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.
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 by toward the instructor by raising your hand and the instructor acknowledging you. 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. ***Use of cell phones in class is prohibited. Talking while lecturing is taking place is not acceptable – it is a distraction from learning.***
6. **Reading Assignments, Pencast Assignments, and Animation Assignments:** Any additional assignment albeit 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.

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 exam. 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 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 dress. Follow all lab safety rules. Late lab are marked down by 20 % of the value of the lab report. 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 3 LABS OR MORE, YOU WILL NOT PASS THE COURSE.
Be sure to record all your lab work in your lab notebook. It is an important part of the lab experience and is the permanent record of what you have done observed and done in the lab. Thus you will be graded on the quality of maintenance of your lab notebook.
9. **Exams:** There will be 5 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). Then in this case your grade will be weighted on 4 exams and a final exam. 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. Routine medical checkups do not count.
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 (non-weighted)
Lab Grade:	220 Cannot miss 3 or more lab days or F for class
5 Exams:	500
Attendance & 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

Tentative Lab Schedule:

Week #	Date	Lab Title/Topic
1	1/19	Intro to Chem 42 Lab and Measurement, precision & accuracy
2	1/26	Significant Figures, Safety Training, Check in, Lab Expectations...
3	2/2	Lab #1 Measurement and Density
4	2/9	Lab #2 Separation of a Mixture Part 1
5	2/23	Separation of a Mixture Lab Part 2
6	3/2	Separation of a Mixture Lab Part 3
7	3/9	Lab #3 Ionic and Molecular Compounds
8	3/16	Lab #4 Making a NaCl solution
9	3/30	Lab #5 Hydrometer Lab – Measuring Concentrations
10	4/6	TBA
11	4/13	Lab # 6 Solution Concentration by Evaporation
12	4/20	Lab # 7 How Much Energy is in Food?
13	4/27	Lab # 8 Chemical Reactions Part 1
14	5/4	Lab # 8 Chemical Reactions Part 2
15	5/11	Lab # 9 Electricity from a Chemical Reaction
16	5/18	Lab Practical Exam

Exam dates: Exam # 1: 02/07/2017

Exam # 2: 02/28/2017

Exam # 3: 03/16/2017

Exam # 4: 04/11/2017

Mini Exam # 5: 05/2/2017 (60 pts) Mini Exam # 6: 05/16/2017

Cumulative Final Exam: Tuesday, May 23 from 4:00 – 6:45 p.m.

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
- 10) Gas Laws, basic stoichiometry, yield calculations
- 11) Lewis structures and intermolecular forces
- 12) Equilibrium, Nuclear, Redox
- 13) Laboratory theory and techniques

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 %].
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 can received constructive criticism.
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 pop quizzes.
9. They properly prepare for the final comprehensive exam by doing # 1-8 above, but they also start a more dedicated review on weekend reworking previous material learned in preparation for the final. The week before they are less stressed than others because they did no 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.

Student signature: _____ Date: _____

By signing above, I indicate my receipt and understanding of the syllabus, guidelines and calendar for Chem 42. This signed document is due January 19, 2017.

NOTE: There are 34 class meeting times – 6 of those days are exam days and 28 days are lecture. $1,000 \text{ points} \div 28 \text{ days} = 38 \text{ points per day}$. When you miss one day of class that is equivalent to missing a potential 38 points of the material you need to learn for the exams. Repeatedly each semester, students tell me that missing class or classes is the number one reason their grade declines. As an instructor who keeps track of attendance, I can assure that this is the biggest area for declining grades.

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 you rework the notes from class and do your homework as quickly as possible after each lecture. The math- and science-related fields build from previous knowledge learned, so, if you did not study the material before the next class, chances are you will have trouble fully understanding the next class lecture. In other words, students tend to average grades C or worse if they “cram.” On the other hand, students who keep up with the class and actively study daily tend to make As or Bs and do much better on the final comprehensive exam.

Week	Day	Date	Lecture Topics
1	M	1/16/2017	
	T	1/17/2017	Atoms, matter, mole, sig. figs
	W	1/18/2017	
	Th	1/19/2017	Mole, structure of atom...
	F	1/20/2017	
2	M	1/23/2017	
	T	1/24/2017	Quantum #, Periodic Table
	W	1/25/2017	
	Th	1/26/2017	Atomic/ionic size, electronegativity
	F	1/27/2017	
3	M	1/30/2017	
	T	1/31/2017	Oxidation numbers and isoelectronic
	W	2/1/2017	
	Th	2/2/2017	Formulas, bonding, naming, molar mass
	F	2/3/2017	
4	M	2/6/2017	
	T	2/7/2017	Exam 1 Units 1 - 4 from previous lectures
	W	2/8/2017	
	Th	2/9/2017	Formula writing, % comp., EF
	F	2/10/2017	
5	M	2/13/2017	
	T	2/14/2017	MF, Writing ionic and net ionic rxns
	W	2/15/2017	
	Th	2/16/2017	PDA day - no classes
	F	2/17/2017	Lincoln's Day Holiday - no classes
6	M	2/20/2017	Washington's Day Holiday - no classes
	T	2/21/2017	Aqueous solutions & acids & bases
	W	2/22/2017	
	Th	2/23/2017	Acids & bases & salts

	F	2/24/2017	
7	M	2/27/2017	
	T	2/28/2017	Exam 2 - Formulas, % comp., EF, net ionics, acids bases & salts
	W	3/1/2017	
	Th	3/2/2017	Lewis Structures (L.S.) & formal charges
	F	3/3/2017	
8	M	3/6/2017	
	T	3/7/2017	IMF
	W	3/8/2017	
	Th	3/9/2017	IMF, MF
	F	3/10/2017	
9	M	3/13/2017	
	T	3/14/2017	L.S. & IMF
	W	3/15/2017	
	Th	3/16/2017	Exam 3 - L.S. & IMF
	F	3/17/2017	Start reviewing for Final exam
			3/20 - 3/26 Spring Break - no classes
10	M	3/27/2017	
	T	3/28/2017	Balancing equations & stoichiometry
	W	3/29/2017	
	Th	3/30/2017	Stoichiometry
	F	3/31/2017	
11	M	4/3/2017	
	T	4/4/2017	Stoichiometry, Gas Laws
	W	4/5/2017	
	Th	4/6/2017	Gas Laws
	F	4/7/2017	
12	M	4/10/2017	
	T	4/11/2017	Exam 4 Gas & Stoichiometry & Balancing
	W	4/12/2017	

	Th	4/13/2017	pH unit
	F	4/14/2017	
13	M	4/17/2017	
	T	4/18/2017	pH unit, buffers
	W	4/19/2017	
	Th	4/20/2017	Solution concentration calculations
	F	4/21/2017	
14	M	4/24/2017	
	T	4/25/2017	redox basics
	W	4/26/2017	
	Th	4/27/2017	nuclear basics
	F	4/28/2017	
15	M	5/1/2017	
	T	5/2/2017	Mini Exam 5 pH unit, buffers, sol'n conc. Calculations, redox basics, nuclear basics (60)
	W	5/3/2017	
	Th	5/4/2017	Equilibrium
	F	5/5/2017	
16	M	5/8/2017	
	T	5/9/2017	Equilibrium and kinetics
	W	5/10/2017	
	Th	5/11/2017	Equilibrium and kinetics
	F	5/12/2017	
17	M	5/15/2017	
	T	5/16/2017	Mini Exam Equilibrium, kinetics, half life & kinetics (40)
	W	5/17/2017	
	Th	5/18/2017	REVIEW Q & A
	F	5/19/2017	
18	M	5/22/2017	Final Exam 4:00 to 6:45 PM
	T	5/23/2017	