

CHEMISTRY 42: INTRODUCTORY GENERAL CHEMISTRY

Fall 2019

Lecturer: Dr. John C. Branca

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Office: Bech Hall 1916 **Office hours:** M 1:30 – 2:30 PM W 1:30 – 2:30 PM

In addition to my office hours, there is a tutorial center (Room 4251 in Doyle Library) that you should utilize, especially if you have never had chemistry or it has been longer than two years since your last chemistry class.

This syllabus is intended to give the student guidance in what may be covered during the semester, and it will be followed as closely as possible. *However, I reserve the right to modify, supplement, and make changes as the need arises, purely at my discretion.*

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.

Library copies of the required textbook are available for checkout. Bring your SRJC Student ID and ask for this call number **QD33.2. R87 2015** if you wish to use the library copies. The *Chemistry Survivor Guide* is a study guide which contains a portion of the notes we use in the classroom during lecture. **Each student** should purchase a new copy, as a used copy defeats its purpose.

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 0449 Lecture: Bech Hall 1910, MW 12:00 – 1:30 PM
Laboratory: Bech Hall 1948, W from 9:00 AM to 12:00 PM
3. **Required Course Materials:**
 - a. **Chemistry 42 Survivor Guide:** *A comprehensive set of notes and assignment for success in an introductory chemistry course*, available at the SRJC bookstore. Authors: J.P. Crowley and John C. Branca. **If unavailable at the bookstore, please purchase at <http://www.lulu.com>**
 - b. **Textbook:** *Introductory Chemistry: Atoms First*, 5th edition. Authors: Michael E. Silver and Steve Russo. *See previous note about library copies.*
 - c. **Scientific or graphing calculator.** No phones or other devices are permitted for use on exams.
 - d. **Standard Laboratory Notebook** (Any dual-page notebook which makes copies automatically). Available at the SRJC bookstore.
 - e. **Laboratory Manual CHEM 42**, available at the SRJC bookstore only.
 - f. **Protective eyewear and apron, which you must purchase at the SRJC bookstore.**
 - g. **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 student learning, that there are points in the grading scale based on quizzes, which will likely occur daily during lecture, thus mandating attendance. Please do not miss or be consistently late to class. The first five minutes are an 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 giving reasons for you not being able to attend lab or exam. In addition, since this is a lab-based course, you must complete a MINIMUM of ten (10) labs, or you will receive an “F” for the entire course, regardless of the performance in the lecture portion of the class. **I do follow SRJC attendance policies, which allow the instructor to drop a student who misses 10% or more of class time.**
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’ work. Cheating, or anything that can be construed as cheating will result in no credit given, as well as other possible consequences.
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 and turn in his or her own lab report. 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.** Refrain from talking while lecturing is taking place because it is a distraction from learning. Laptops are not necessary for this course and should not be used, *without approval of the instructor in advance.*

6. **Reading Assignments, Pencast Assignments, and Animation Assignments:** Any additional assignment, be it homework, pencast viewing, or animation viewing, is 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.
7. **Homework Assignments:** Chemistry is a vertical subject that is best learned in appropriate chunks. As an instructor, I have gone to great lengths not to 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 a high 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) 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 labs are marked down by 20 % of the value of the lab report. Please do not miss labs because a zero has, at a minimum, a 10 % effect on your overall lab grade. Zeroes are given, there are **no incomplete (I) grades given** for missing labs, in other words, **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 THREE (3) LABS, YOU WILL NOT PASS THE COURSE.**

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 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 four (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 properly documented (a thoroughly explained and correctly dated document from a medical doctor for reasons you were not able to attend lab or exam).** I will discuss make-up only after having received proper documentation from the individual during my office hours.
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 one's 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:

Factors:

Lab Grade:	25%
Mid-term Exams:	45%
Quizzes:	15%
Final Cumulative Exam:	15%

Final course letter grade will correspond to the following percentages:

A	89% or higher
B	78% - 88%
C	66% - 77%
D	54% - 65%
F	<54%

Tentative Lab Schedule:

Week #	Date	Lab Title/Topic
1	8/21	Lab Safety / Chem 42 Intro / Metrics
2	8/28	Calculations and Dimensional Analysis
3	9/4	TBA
4	9/11	Measurements Lab / Locker Check-in
5	9/18	Separation of a Ternary Mixture Lab
6	9/25	Atoms and the Electromagnetic Spectrum
7	10/2	Ionic and Molecular Compounds
8	10/9	Lewis Structures
9	10/16	Observing Chemical Reactions
10	10/23	Synthesis of Indigo Dye
11	10/30	Electrochemistry and Activity Series
12	11/6	Gas Laws
13	11/13	Preparation and Concentration of a Solution & Hydrometer Lab
14	11/20	Preparation and Concentration of a Solution (Week 2)
15	11/27	TBA
16	12/4	Acetic Acid Titration
17	12/11	LAB CHECK OUT
18	12/18	FINAL EXAM

Tentative Exam dates:
Exam # 1: 09/11/2019
Exam # 2: 10/02/2019
Exam # 3: 11/04/2019
Exam # 4: 12/02/2019

Cumulative Final Exam: Wednesday, December 18, 2019 from 10:00 AM - 12:45 PM

Medical condition regarding missing an 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 must present written documentation from the doctor, on appropriate letterhead, which 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.***

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: 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 receive and implement 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 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 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.

Tentative Lecture Topics Schedule

Day	Date	Lecture Topics
M	8/19	Atoms, matter, mole, significant figures, structure of the atom.....
W	8/21	Atoms, matter, mole, significant figures, structure of the atom.....
Su	8/25	Last day to register/add without instructor's signature or add code
M	8/26	Quantum numbers, Periodic Table...
W	8/28	Atomic and ionic radius size, electronegativity
Su	9/1	Last day to drop and be eligible for a refund
M	9/2	Labor Day – No classes
W	9/4	Oxidation numbers, bonding, naming, formula writing...
Su	9/8	Last day to drop class without a “W” symbol or add with an add code
M	9/9	Percent composition, molar mass of compounds, empirical formula (First Census Day)
W	9/11	Mid-term Exam #1
M	9/16	Lewis Structures
W	9/18	Lewis Structures, IMF
M	9/23	IMF, Balancing Reactions
W	9/25	Balancing Reactions
M	9/30	Oxidation numbers of elements in polyatomic ions
W	10/2	Mid-term Exam #2
M	10/7	Redox
W	10/9	Redox, Electrochemistry
M	10/14	Electrochemistry
W	10/16	Gas Laws
M	10/21	Gas Laws, Stoichiometry
W	10/23	Stoichiometry
M	10/28	Stoichiometry and Acids, Base & Salts
W	10/30	Acids, Base & Salts
M	11/4	Mid-term Exam #3
W	11/6	pH & Concentration problems % m/v, % v/v, $M_1V_1=M_2V_2$, $MaVa= MbVb$
M	11/11	Veteran's Day – no classes
W	11/13	Concentration problems % m/v, % v/v, $M_1V_1=M_2V_2$, $MaVa= MbVb$
Su	11/17	Last day to drop a class with a “W”
M	11/18	Nuclear
W	11/20	Nuclear
M	11/25	Equilibrium, pH
W	11/27	pH, Equilibrium
M	12/2	Mid-term Exam #4
W	12/4	Equilibrium & Antilog
M	12/9	Buffers
W	12/11	Go over grades, review Q and A
W	12/18	Final Exam 10:00 AM – 12:45 PM
F	1/3	Grades will be posted in Student Portal (latest)

For student privacy reasons (FERPA): 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 8/19/2019 (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 August 19, 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 four (4) exams and a final exam. Each exam builds off previous material. Each exam gets progressively more difficult.

_____ 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 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 that there are no make-up exams.