

Chemistry 1B, General Chemistry

Fall 2016, Sections 05 & 06

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Lecture time: T, Th 10:30 - 11:45 am (L47)
Section 05 lab: T, Th 7:30 - 10:20 am (SC2204)
Section 06 lab: T, Th 2:30 - 5:20 pm (SC2204)
Office hrs: T, Th 12:40 - 2:20 pm (SC1220)
or by appointment

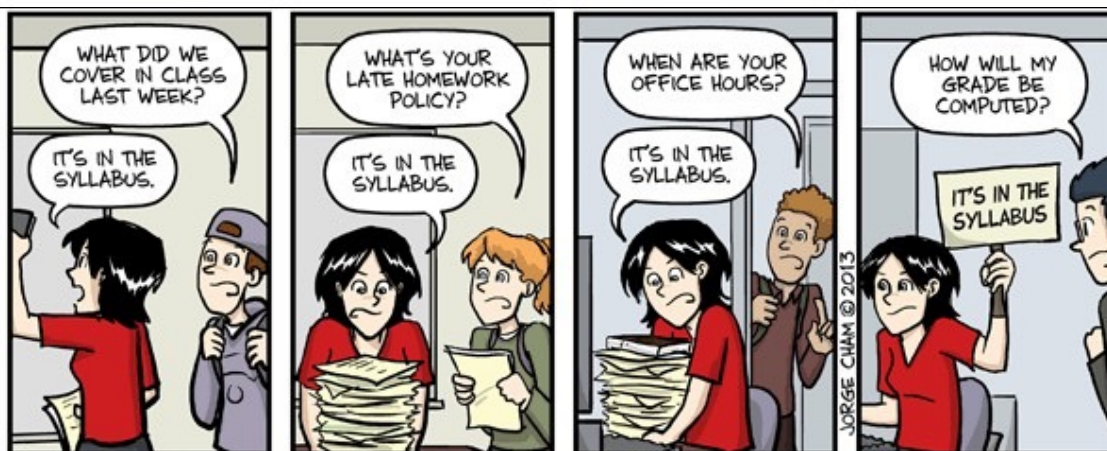
Class website:

www.deanza.edu/faculty/wankanny/chem1bw16/index.html

Chem 1B is the second of a three-quarter general chemistry course. This class investigates intermolecular forces and their effects on properties, gas laws and kinetic molecular theory, and reversible reactions from the standpoints of kinetics, thermodynamics and equilibrium.

Required course material

- 1) OSHA approved laboratory safety goggles from the bookstore (Uvex Stealth).
Other types of goggles are NOT permitted.
- 2) A scientific calculator with at least log and exponential functions.
Graphing calculators or cellphones will not be allowed for tests! (e.x. TI-30X).
- 3) Permanently bound laboratory notebook with duplicate copies.
Carbon/carbonless - re-use an unfinished notebook from another class if you have one.
- 4) Chemistry: The Molecular Nature of Matter and Change, 7th edition by Silberberg and Amateis (McGraw-Hill: 2012; ISBN 978-1-25-943287-3)
Note: Given the high costs of textbooks, you are welcome to use a previous edition of this textbook but all of the homework/ practice problems, section numbers, diagrams, or tables referred to in class correspond only to the official text and it is your responsibility to match the problems/content to our official text. A copy of the official text will be available during office hours for comparison.
- 5) Lab manual (available free @ <http://deanza.edu/chemistry/Chem1B.html>)
- 6) Optional but highly recommended: Latex/Nitrile Gloves and labcoat



IT'S IN THE SYLLABUS

Attendance & tardiness, absences and make up policies

Attendance: Attendance is expected for all class periods. A sign in sheet will be provided at each class to record attendance. Please be on-time and stay for the duration of the whole class until dismissed. The lecture and the course cannot be taken as separate courses and you have to attend the sections that you are enrolled in – no switching allowed under any circumstances.

Tardiness: No extra time will be given if you arrived late to a quiz, exam or final.

Lab lectures are an important part of the lab class - they contain vital safety information. As such, **3 points will be taken off of your lab grade each time you are over 10 minutes late for class. If you are not present by the time the lab lecture is finished, you will NOT be allowed to perform the experiment will receive a '0' for the lab report score for that lab.**

Absences: When you know that you will miss class (even 10 minutes before class), **contact me immediately** by e-mail or phone and give a brief explanation for your absence. Absences will only be excused for medical emergencies or other emergencies (e.g. death in family) with written verification **and** if I was given proper advanced/reasonable notice for your absence.

Note: If you have any unexcused absence in the first 2 week of class, you'll be dropped, and an unexcused lab absence results in a '0' for the lab report score for the missed lab, and

TWO or more unexcused lab absences will result in an automatic 'F' for the entire course.

Make-up policies: No missed work/quizzes/tests could be made-up with unexcused absences.

In the cases of excused absences:

- **Lectures & lab lectures:** If you've missed lectures or lab lectures and no quizzes were given, then just listen to the audio recording and review the class notes on the course website
- **Pre-labs:** You must turn in the completed pre-lab as soon as you return to class.
- **Labs:** **Missed labs cannot be made up.** I may supply you with data necessary to complete the lab report, or your grade may be based on your average lab report scores.
- **Quizzes, exams & finals:** **quizzes, exams and finals cannot be made up.**

Note: In the case of a true, verifiable emergency, I may make an exception and allow you to take the exam at another time in the same week if you contact me immediately with proof and make alternative arrangement. For a final, you may have to sign an official contract with me and receive an 'incomplete grade' until you take the test within one month of the original date – if you fail to resolve the contract, then your grade will be based on work completed.

Registration and drop policies

Registration: Enrollment in each section is strictly limited to 30 students. You have to attend the lab section that you registered for due to insurance reason.

Waitlist: Waitlisted students have to be present for all lecture classes and lab lectures to receive an add code when spaces become available. Add code will first be given in the official wait-list order, and then on a first-come first serve basis.

Drop or withdrawal: **YOU** have to initiate the drop or withdraw process by the below deadlines or you will receive a grade based on the work completed. I reserve the right to initiate a drop in cases of excessive unexcused absences (4 or more) **or any in the first 2 weeks. Let me know if you plan to miss class during the first two weeks of class** to avoid being dropped automatically.

Note: Once checked in, you'll need to checkout of your lab locker to avoid fees (see P.6).

Registration deadlines this quarter	Last day to add class	Drop class with no record	Pass/fail deadline	Drop class with a 'w'
	1/16/16 (Sat)	1/17/16 (Sun)	1/29/15 (Fri)	2/26/15 (Fri)

Tentative Class schedule

Week	Date	Lecture topic	Chapter	Lab topic	Report due
1	1/5	Phases and intermolecular forces (Quiz 1)	12	Introduction + check in	
	1/7	Liquid states and water	12	B1: Molar volume (day 1)	
2	1/12	Solid state & materials (Quiz 2) (HW)	12	B1: Molar volume (day 2)	
	1/14	Gases day 1	5	B2: Vaporization (day 1)	
3	1/19	Gases day 2 (Quiz 3) (HW)	5	B2: Vaporization (day 2)	B1
	1/21	Gases day 3	5	B3: Kinetics (day 1)	
4	1/26	Exam 1 (HW)		B3: Kinetics (day 2)	
	1/28	Reaction rates	16	B3: Kinetics (day 3)	B2
5	2/2	Rate laws and kinetics (Quiz 4) (HW)	16	B3: Kinetics (day 4)	
	2/4	Mechanism and catalysis	16	B4: Equilibrium (day 1)	
6	2/9	Equilibrium day 1 (Quiz 5) (HW)	17	B4: Equilibrium (day 2) Lab Exam 1	
	2/11	Equilibrium day 2	17	B5: Acid base constant	B3
7	2/16	Le Châtelier's principle (Quiz 6) (HW)	17	B6: pK of indicator (day 1)	B4
	2/18	Exam 2		B6: pK of indicator (day 2)	
8	2/23	Acid bases (HW)	18	B7: Green crystal (day 1)	B5
	2/25	Acid bases equilibria day 1	18	B7: Green crystal (day 2)	
9	3/1	Acid bases equilibria day 2 (Quiz 7) (HW)	18	B7: Green crystal (day 3)	
	3/3	Thermodynamics	20	B7: Green crystal (day 4) Lab Exam 2	B6
10	3/8	Entropy & free energy (Quiz 8)	20	B8: Temp. on K (day 1)	
	3/10	Exam 3 (HW)		B8: Temp. on K (day 2)	
11	3/15	Class canceled			
	3/17	Free energy and equilibrium	20	Lab Final & check out	B7 & B8
12	3/24	Final exam (Thurs), at 9:15 - 11:15 am in L47 (HW)			

This schedule may be changed at any time with proper advanced notice. (HW) = homework due

Grades

The point distributions and the grading scale for the course is as follows:

Lecture		Lab		Grading Scale					
Task	Points	Task	Points	Grade	Points	%	Grade	Points	%
Exam 1	150	Lab reports	84	A+	960 - 1000	96 - 100	C+	760 - 779	76 - 78
Exam 2	150	Lab write up	24	A	900 - 959	90 - 96	C	700 - 759	70 - 76
Exam 3	150	Lab Exam 1	40	A-	880 - 899	88 - 90	D+	680 - 699	68 - 70
Final	250	Lab Exam 2	40	B+	860 - 879	86 - 88	D	620 - 679	62 - 68
Quizzes	50	Lab Final	62	B	800 - 859	80 - 86	D-	600 - 619	60 - 62
Total	750	Total	250	B-	780 - 799	78 - 80	F	0 - 599	0 - 60
Total points for class: 1000									

If you score less than 60% on either the lecture or the lab portion of the class, OR you have more than two '0' scores for lab reports, you will receive an 'F' for the class.

Grades & assignments

Curves: Your grade is based on your earned point total only, and the grading scale above guarantees the minimum grade that you will receive in this class. No curves will be applied. However, **your 3 lowest quiz scores will be dropped**. Additionally, **if you show improvement (ie. if your percentage on the final exam is higher than that on your lowest exam), then the score for that lowest exam/lab exam will be replaced by the final/lab final exam score (in terms of %)**. No scores will be changed if you've scored lower on the final than your exams.

Extra Credit: 20 points of extra credit (2 points each x 10 collection total), which boosts 1/2 a grade if you are on the border, will be awarded for timely completion of homework assignments. To receive credit, all questions must be answered (with all work shown and the numerical answers boxed); however, you do not need to copy the question or answer in complete sentences. Homework will be given after every lecture and collected every 2-3 lectures (see schedule above for due date) - **no credit will be given to incomplete or late homework**.

All homework (due in lecture) and lab reports (due in lab) are due **at the beginning of class** on the dates stated in the schedule (see P.3).

20% of the total grade will be deducted for each 24 hours that the lab report is late.

Lab safety

Lab safety is EXTREMELY important! You MUST abide by all rules on the safety agreement contract at all times (attached at the end). Violation may result in a point deduction, a dismissal from lab (which will be a '0' for that lab report) or expulsion from the course (and a "F"). Lab cleanliness is also very important - **lab points may be deducted for any mess left behind**.

Pre-lab format

Pre-lab: Before each new experiment, you are required to prepare a pre-lab. You will show me your pre-lab at the beginning of class of the first day of every experiment, where I will verify whether you have completed the pre-lab satisfactorily. **If your pre-lab is incomplete, I may deduct points or ban you from doing the experiment (which will result in a '0' for lab report).**

General notes: Always write in pen and record any data directly into the notebook. Never write in pencil, erase, use a white-out or completely scratch something out in your notebook – use a single line through the text if correction is needed. Write in third person and passive voice!

The format of the pre-lab is as follows:

1. **Title of the experiment and date it is performed.**
2. **Abstract:** one or two sentences summarizing the main purpose of the experiments. If chemical equations are involved please include this in the abstract as well.
3. **List of chemical hazards:** list any important safety information about the chemicals you are using in your experiment. If the info wasn't already in the experimental procedure, write down the compound's name and leave a space for filling in the info when I talk about it in lab lecture.
4. **Chemical disposal:** for each chemical you are using, list the appropriate waste container for its disposal (ie. acidic aqueous, basic aqueous, or organic). If you are unsure, write down the compound's name and leave a space for the info to be filled in during lab lecture.
5. **Procedure:** rewrite the full experimental procedure in your own words – **write with enough detail so that you can run the whole experiment with only what you wrote in your lab notebook**. Leave a margin by your procedure to record any deviations from the planned procedure and observations. You do not have to include any theory or any of pre-lab questions (if applicable).
6. **Data table:** re-write all data tables for the experiment into your notebook

Lab notebook format

Lab reports are required for 7 labs, and they will be submitted in the form of your lab notebook or its tear-outs. As such, please **write legibly for your pre-lab and throughout your experiment.**

Your lab notebook should include a table of content at the beginning, one that you update after every experiment. It should be followed by experiments, and each experiment should contain:

1. **Items listed in pre-lab:** see page 4. Update the procedure as needed during the experiment.
2. **Observations:** Note any color changes, bubbles, instrumentation problems, etc. in the right hand column next to the procedural steps.
3. **Data and calculation:** Record the data in the data table written in pre-lab and complete all the calculations necessary in this section of the notebook. If graphs are needed, attached them in the notebook and describe how you obtained them.
4. **Conclusion/Questions:** As indicated on the worksheets in your lab manual.

Lab write up format

A formal lab write-up will be required for one of the experiment (to be specified later). This write-up will be worth 24 points (compared to 12 pts for lab reports). The **lab write-up must be typed - no hand-written report will be accepted.** It should be written in 3rd person and passive voice with correct sub/superscript notations (ie. H₂O, not H2O). The format is as follows:

1. **Title:** Include the title of the experiment at the beginning of the report.
2. **Objective:** State the key quantitative results that you are seeking in the experiment and the method utilized to obtain and determine these results.
3. **Procedure:** State the page numbers of the procedure in your lab notebook. Don't retype the procedure. Credit any collaboration and explain who did what here if applicable.

4. **Data, calculations and graphs:**

Data: should be listed in a table or tables, be clearly labeled and include the proper units of measurement. Make a note of any data that you didn't personally collect here.

Calculations: should be listed alongside the data in the data table. Be sure to include the appropriate unit(s) of measure and to define any variable names used in your calculations.

For each unique kind of calculation, you must type out (once per unique calculation):

- 1) The general mathematical formula (ie. definition without numbers)
- 2) One example of the equation substituted with actual data.

If the calculation is repeated multiple times, the rest of the results may simply be tabulated after the formulas.

Graphs: If graphs are necessary, then the graphs should be done using Microsoft Excel with all axes labeled with the proper units and pasted into this section of the report.

5. **Conclusion:** Your conclusion should exactly parallel your objective – meaning you should state exactly those quantitative or qualitative results that were the focus of the experiment.
6. **Discussion:** To help justify your conclusion, include a brief discussion of how your data and calculations led you to your stated results and the theory/technique used if it helps to explain your results. Also include an explanation of any sources of errors that might explain why your results are different from the known or expected values.

Instead of printing, you may email a pdf (not a .doc file, a pdf file only) of your lab report to me with the subject "Chem 1A lab report" **before** the due date.

You must complete the lab report, along with all the calculations and analyses, on your own. Sharing data is ok, but sharing any other part of the report will constitute as plagiarism (see P.6).

Lab emergency procedures

You must inform me immediately in the case of any accidents, spills or injury.

- **Spilled something?** Report it to me immediately and I'll guide you through the cleanup.
- **A chemical splashes in your eye?** Report it to me immediately, and then flush your eyes at an eyewash station as directed (usually for 15 minutes straight).
- **Splashed a chemical on yourself?** Report it to me immediately and then, unless otherwise directed, rinse the affected skin with large quantities of water for 15 minutes straight.
- **Splashed a large quantities of a hazardous chemical on yourself?** Report it to me immediately and then, if advised, use the emergency chemical shower. You may be forced to remove chemically contaminated clothing (so keep an extra set of clothes in your car if possible).
- **Fire?** Report it to me immediately! Don't try to put it out yourself – water may worsen chemical (metal) fires or electrical fires. Fire alarms are located in all lab rooms.
- **Your clothes or hair caught on fire?** Use the safety shower immediately and alert me ASAP. If this is not possible “stop-drop- and –roll.”
- **Earthquake?** Step away from all lab equipment, duck under a lab bench or door frame, and cover your head. Do not exit the building during an earthquake as exit doors may contain glass or be near windows, and tiles or debris may fall from the roof. Once the quake passes, gather only vital personal possessions and evacuate to the designated area.
- **Emergency phones:** If directed (or deemed necessary), pick up any campus phone and dial 911, or dial (408) 924-8000 to reach police in case of emergencies. For non-emergencies, dial (650) 949-7313.

Lab check-in and out policy

You must check into a lab locker on the first day of lab. Once checked-in, **you will be held responsible for any missing or broken lab locker equipment until you check out. You MUST check out of your locker once you've checked in**, whether you complete the course or not. **Failure to check out of lab by the scheduled check-out date will result in a late fee and may also result in your grades being held and/ or a block being placed on your future registration.** If you drop within the official add period during a quarter, you must clean out your locker immediately. If you fail to do so, your locker may be cleared and reassigned to another student. After the add deadline (the first two weeks), if you drop or withdraw, you must check out by the assigned checkout date for your laboratory section.

Conduct policy

Academic Dishonesty: As a student at De Anza College, you are bounded by the Academic Integrity policy as outlined in the De Anza College catalog at all times (see <http://www.deanza.edu/studenthandbook/academic-integrity.html>). Any violation may result in expulsion from the course, a grade of “F” for the course and a referral to the dean of PSME. Collusion, if proven, will result in each student receiving the same penalty. Please ask me if you are ever unsure about the policy.

Conduct in class: You are also bounded by the Student Code of Conduct. I will not tolerate any disruptive or abusive behavior towards myself or any student in the class, and if you do so, you may be dismissed from class/ reported to the dean of student development for disciplinary action.

You may use electronic devices to take notes in class, as long as you think that it'll help you learn and their usage are not disruptive/distracting to me or others (please turn on silent mode!). Other than pre-approved calculators & translators, no devices can be used during quizzes/exams.

Learning objectives

Student learning outcome:

- 1) Evaluate the principles of molecular kinetics.
- 2) Apply principles of chemical equilibrium to chemical reactions.
- 3) Apply the second and third laws of thermodynamics to chemical reactions.

Course objectives:

- 1) Evaluate how intermolecular forces influence solids, liquids and phase changes.
- 2) Calculate the rate of a reaction and assess the mechanism of action.
- 3) Utilize the fundamental principles of equilibrium to probe reaction dynamics.
- 4) Differentiate between acids and bases and evaluate their reactivity.
- 5) Employ the principles of equilibrium in an expanded discussion of thermodynamics.
- 6) Analyze the behavior of gases

Tips for Success

- Dedicate **at least 8 hours every week to studying** for the class (reading the text, doing homework/practice problems, reviewing notes). Students with 'A' studied avg. 15-20 hrs/week
- **Read the assigned chapters BEFORE you come to class (!!!).**
- Come to class and **be ready to be engaged and learn**. Yes, that means reading before class!
- **Do the homework assignments promptly after every class** – a lot of chemistry concepts build on each other, so if you haven't mastered the basics you will definitely have trouble mastering principles later on.
- **Don't cram before an exam**. Seriously, if you leave everything to the day (or even the week) before the exam it is not going to go well for you.
- **Come to office hour**. You don't need to have a specific question to come. In fact, I encourage you to come and sit and just work through problems on your own – that way you'll be dedicating at least 4 hours to chemistry each week and I'll be there for whatever question you have while working through problems. I promise I don't bite (and I'll probably have candy) =].
- **Form study groups** – Make friends with your classmates and study together! Being in a group can help encourage studying, and it'll give you the opportunity to teach each other, which is the best way to learn. But working in a group may also be distracting- do whatever works for you.
- **Go for understanding rather than memorization**. Rather than knowing facts, know why and how the facts came about. There will be problems on your test that you've never seen before that will test your ability to think and integrate concepts.

There are also a number of services available on campus to help you in your studies, including:

- **Mathematics, Science and Technology Tutoring Center (in S43):**
Drop-in tutoring, weekly individual tutoring, group tutoring
- **Counseling and Advising (in SCS - Student and Community Services):**
Provides counseling (academic or personal), transfer planning, and psychological services
- **Health Services (in Hinson Campus Center):**
Includes services such as minor first aid, medical exams, and immunizations

Special accommodation: If you have a physical or psychological disability, many accommodations and services are available through Disability Support Programs & Services (in SCS). Please contact DSP&S for a TAV form if **you require academic accommodation on assessments** (ie. additional time, a reduced-distraction environment, the use of alternative media/assistive technology, etc.). No accommodation will be given otherwise.

From the American Chemical Society Safety In Academic Laboratories Guidelines, 7th Ed., the following mandatory minimum safety requirements must be followed by all students and be rigorously enforced by all Chemistry faculty:

- 1) Chemistry Department-approved safety goggles purchased from the De Anza College bookstore (NOT safety glasses) must be worn at all times once laboratory work begins, including when obtaining equipment from the stockroom or removing equipment from student drawers, and may not be removed until all laboratory work has ended and all glassware has been returned to student drawers.
- 2) Shoes that completely enclose the foot are to be worn at all times; NO sandals, open-toed, or open-topped shoes, or slippers, even with socks on, are to be worn in the lab
- 3) Shorts, cut-offs, skirts or pants exposing skin above the ankle, and sleeveless tops may not be worn in the lab: ankle-length clothing must be worn at all times
- 4) Hair reaching the top of the shoulders must be tied back securely
- 5) Loose clothing must be constrained
- 6) Wearing "...jewelry such as rings, bracelets, and wristwatches in the laboratory..." should be discouraged to prevent "...chemical seepage in between the jewelry and skin...".
- 7) Eating, drinking, or applying cosmetics in the laboratory is forbidden at ALL times, including during lab lecture
- 8) Use of electronic devices requiring headphones in the laboratory is prohibited at ALL times, including during lab lecture
- 9) Students are advised to inform their instructor about any pre-existing medical conditions, such as pregnancy, epilepsy, or diabetes, that they have that might affect their performance.
- 10) Students are required to know the locations of the eyewash stations, emergency shower, and all exits
- 11) Students may not be in the lab without an instructor being present
- 12) Students not enrolled in the laboratory class may not be in the lab at any time after the first lab period of each quarter.
- 13) Except for soapy or clear rinse water from washing glassware, NO CHEMICALS MAY BE Poured INTO THE SINKS; all remaining chemicals from an experiment must be poured into the waste bottle provided.
- 14) Students are required to follow the De Anza College Code of Conduct at all times while in lab: "horseplay", yelling, offensive language, or any behavior that could startle or frighten another student is not allowed during lab;
- 15) Strongly recommended: Wear Nitrile gloves while performing lab work; wear a chemically resistant lab coat or lab apron; wear shoes made of leather or polymeric leather substitute.

By signing below, I, _____,
First Name Family Name

acknowledge that I fully understand and agree to abide by the laboratory safety rules listed above. Further, I acknowledge that my failure to abide by these rules will result in my being dropped from this chemistry class immediately.

Signature

Date