

Introduction to General, Organic and Biochemistry (Chem 30A)

Syllabus – Spring 2022

Contact Information

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I am available to answer questions and assist you with working through problems and strategizing to maximize your success in the course. If my scheduled office hours do not work for you, please do not hesitate to contact me so that we can arrange for an alternate time. Chemistry is an unavoidably challenging subject, but my aim as an instructor is to make sure that you have the tools you need to rise to the challenge.

Meeting Times

Course Record Numbers: 44859 (Mon Afternoon Lab); 46107 (Wed Afternoon Lab); 42682 (Mon Evening Lab); 42690 (Wed Evening Lab)

Online Lecture Content: Delivered asynchronously through scheduled video modules in Canvas, to be viewed **before** the in-person lecture period for a given week

In-Person Lecture: Mon/Wed 2:30-4:20 pm (44859/46107) **OR** Mon/Wed 5:30-7:20 pm (42682/42690) in MLC105

Lab: Mon 11:30 am-2:20 pm (44859); Wed 11:30 am-2:20 pm (46107); Mon 7:30-10:20 pm (42682); Wed 7:30-10:20 (42690) in SC2204

Regular Office Hours: Mon/Wed 11:00-11:20 am in SC1222 and Tue 5:30-6:20 pm (on Zoom)

Workshop Office Hours: Mon/Wed 4:30-5:20 pm in MLC105

Overview

Course Description: Chem 30A is the first in a two-course sequence for students entering allied health fields. The focus of the first part of this class is an introduction to general chemistry. Topics include atomic structure, trends in the periodic table, the three states of matter, energy, chemical bonding in ionic and molecular compounds, nomenclature, measurement and the metric system, chemical reactions and equations, solutions, acids, bases, salts and electrolyte systems.

Prerequisite: A grade of C or better in MATH 114 or MATH 130 or the equivalent.

Required Course Materials

Required

Lecture Text: In this course I will aim to provide you enough specific materials to make clear the body of content you are expected to learn, so that you can use the textbook as a supplementary resource, rather than a primary one. You may therefore feel free to use the freely available version of the text “The Basics of General, Organic and Biological Chemistry,” by David Ball et al., which can be found at the link below:

- [The Basics of General, Organic and Biological Chemistry](#) (Online and pdf versions available)

Alternatively, if you prefer, you may purchase the textbook currently used in the department (any earlier edition is fine):

- Janice G. Smith, *General, Organic and Biological Chemistry*, 5th ed., McGraw-Hill. ISBN: 9781307713107

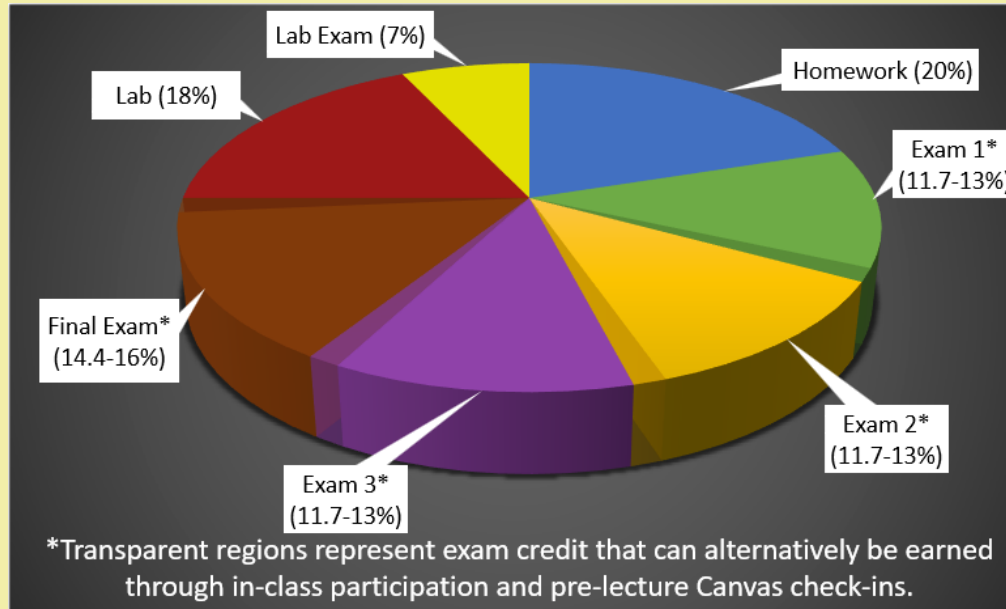
Scientific or Graphing Calculator: You will need a calculator that is capable of handling the standard arithmetic operations, as well as logarithms and exponentials. Any standard scientific calculator is likely to be sufficient.

Safety Goggles: Goggles must form a seal around the sides as well as at the front, and must carry the ANZI Z87 shatter resistance rating. Goggles are available at the campus bookstore, but may also be obtained from another source, provided they meet the given specifications.

Disposable Gloves: Gloves should be neoprene or nitrile (not latex) and are available at standard drug stores (CVS, Walgreens, etc.). Gloves will also be available in the lab, but students may acquire their own if desired.

Grading Breakdown

General



The general scoring breakdown for the course is shown here, with lab work accounting for 25%, homework for 20%, and lecture assessments the remaining 55%. Up to 10% of the weight each exam can be replaced by completion of pre-lecture Canvas check-ins and in-class exercises (reducing the weight of exams by a maximum of 5.5% to a minimum of 49.5% of the overall course grade).

The rough grading scale for the course is shown here:

- - >90% = A+/A/A-
 - 80-90% = B+/B/B-
 - 70-80% = C+/C
 - 60-70% = D+/D/D-
 - <60% = F

Exams are not curved, however the grading brackets may shift downward (i.e. in your favor) in the final grade calculation to allow for adjustment in case the difficulty of some assessments is over-tuned in any particular term. The brackets will not, however shift upward (so for instance it is possible that the cutoff for an A- would ultimately shift to 89%, but it will not shift to 91%).

Homework

Homework assignments (200 points) are submitted through Chem101, accessed through the links in the weekly Canvas modules. Each unit has a primary homework assignment as well as a supplemental assignment. The primary assignment is the required homework necessary to provide basic exposure to the content being covered and to give you a sense of what you understand and what you need additional work on. The supplemental assignments are to give you extra practice on topics about which you are less confident. The supplemental assignments are not a separate portion of the course grade, but may be used to make up for any points missed in the corresponding primary homework. For instance, if you completed the primary assignment for Part 3, but were shaky on certain concepts and scored 7/10 points, you could complete problems from the Part 3 supplemental assignment worth an additional 3 points to bring up your score for part 3 homework to 10/10. In this way it is possible for everyone to obtain 100% credit on the homework portion of the grade, even if they miss points along the way. Supplemental homework cannot be used to bring your homework score above 100%, though it can still be useful for extra practice if you find you are struggling with a particular concept.

Lecture Assessments

Assessments of lecture content knowledge will include three midterm exams, and one comprehensive final exam. The three midterm exams (130 points each) will be held during the Wednesday lecture periods **4/20, 5/18 and 6/8**. The final exam (160 points) will be held during the times designated by the college on either **Wednesday, 6/22 from 1:45 to 3:45 pm** (for sections 44859 and 46107) or **Friday, 6/24 from 6:15 to 8:15 pm** (for sections 42682 and 42690).

Lab

The majority of the lab component of the course grade (180 points) will come from completion of prelab exercises, participation in the actual lab experiments, and submission of completed data pages. Each of the seven experiments will be worth a total of 30 points, with the lowest score being dropped. Prelab exercises appear on Canvas and must be submitted **before the start of the lab period**. Completed lab packets will generally be due by Saturday of the following week, though in many cases you will likely complete the packet during the lab period, in which case you can simply upload it before you leave.

Lab Exam

The lab exam (70 points) will account for the remainder of your lab score and will be held during the final lab period on Monday 6/13 or Wednesday 6/15. This exam will focus on your understanding of the underlying techniques and concepts that we have learned during the quarter, rather than on the procedural specifics of the exact experiments we performed.

Classroom Policies

Attendance

Lecture Videos: The initial presentation of lecture topics for this course takes the form of course videos accessible from the Canvas modules page. This means that you can take the lectures at your own pace and on your own time, slowing them down or speeding them up depending on how confident you feel about a particular topic, and rewinding to catch anything you missed. While you may watch the videos on your own schedule, they should be viewed **before the lecture period for the week in which they are assigned**, since the synchronous meeting will focus on practice with applying the knowledge gained from the videos, and will presume some exposure to the topics ahead of time.

Lecture: Participation during the lecture is critical, as this is where we will engage with the broad range of topics covered in the course, and where I will make clear the level of mastery that I will be expecting to see from you when exam time rolls around. While missing lecture will not directly impact your grade if an assessment is not being given, frequent absences will substantially increase the likelihood that you will not perform well on assessments. The lecture will also include various in-class exercises, and your work from these exercises can be submitted for optional exam-replacement credit. These points, along with those for the pre-lecture Canvas check-ins, are not required, but may be used to reduce the weight of the lecture exams by up to 10%. For instance, the base value of the first exam is 13%, however if you submit the in-class exercises and Canvas check-ins associated with that assignment, the weight of the exam would be reduced to 11.7% and you would receive full credit for the remaining 1.3%.

Lab: Participation in lab includes arriving prepared and on-time to the lab session, as we will cover important issues related to lab techniques and safety at the start of the period. Any student arriving more than 15 minutes late to the lab period or leaving without completing the lab will be considered absent and will not receive credit for that lab. The lowest lab score will be dropped from your course grade, so one lab absence for any reason is allowed with no penalty. A second lab absence will result in zero points for that lab, and **three or more lab absences will lead to an automatic failing grade in Chem 30A.**

Behaviour

Lecture Participation: The aim of the lecture period is to aid students as much as possible in grasping the course material. To that end, your participation is critical to ensuring that we make optimal use of the limited time we have together. Answering questions that I ask, and asking questions when you are confused are the best ways to let me know what you do and do not understand yet. If you simply try to passively absorb lecture content without active engagement, you will not develop the skills necessary to approach and solve complex problems on your own.

Course Workload: Chemistry can be a challenging subject, so it is important to set aside the time you will need beyond the synchronous course hours to increase your mastery of the material, particularly if you are new to chemistry or know that you have found the subject to be challenging in the past. Most critically, this begins with making sure to watch the course videos before coming to the synchronous lecture period, so that you have a sense of the content being covered and can ask questions about any topics you were unclear on. In addition, you will need to set aside time for working through homework problems, as well as practice exams in weeks leading up to assessments. These practice exams will give you the best sense of what to expect on the actual exams. Overall, the most important thing you can do to succeed in this course is make sure to get to work early and not fall behind. We will cover a large number of topics in a short period, and later content builds on earlier concepts, so it is very difficult to catch up if you don't set aside enough time early on. It is much better to plan for more time than you need and discover later that you have some free time on your hands, than to find out halfway through the term that you should have planned for more study time when you have already fallen behind and the course continues to move at a brisk pace.

Respect for your Peers: The lecture is not only about your learning experience, but also about that of your fellow students. This means that it is important that you be respectful of their time by not engaging in behaviour that is disruptive. While you may use electronic devices in class for the purposes of aiding in your own learning process, you may not use them in a way that serves to distract your classmates or otherwise detract from their learning experience. In addition, the classroom is a place where students with diverse backgrounds and identities come together and work toward common learning goals. As we progress in our collective quest to surmount the neverending challenges that chemistry sends our way, we are all entitled to a collegial and supportive learning environment. Any behaviour or language that is hostile or demeaning to your fellow classmates is therefore not acceptable classroom behaviour (or good general practice as a human).

Safety in the Lab

Below are general safety guidelines applicable any time you are working in a chemistry lab. For separate departmental safety protocols related to COVID-19, see the additional document [here](#).

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. Reckless behavior will not be tolerated. If your actions endanger the health and safety of yourself or someone else you will be asked to leave and you will receive a zero for the day.

Important Dates

April 4: District flex day - no class

April 16: Last day to add

April 17: Last day to drop without a "W" grade appearing on transcript*

April 20: Midterm exam 1

May 18: Midterm exam 2

May 27: Last day to drop classes with a "W"*

May 30: Memorial Day holiday - no class

June 8: Midterm Exam 3

June 13 or June 15: Comprehensive Lab Exam

June 22 or June 24: Comprehensive Final Exam

* Note that dropping the course in advance of either the drop or withdraw deadline is your responsibility, and you will not simply be dropped because you stopped attending class at some point along the way.

Academic Accommodations

If you have the need for specific accommodations, such as extended-time or reduced-distraction testing, or the use of assistive technology, I am glad to work with you to arrive at an appropriate accommodation arrangement. All such requests must go through Disability Support Programs and Services (DSPS), located in the Advanced Technology Center (AT209). If you need accommodations but are not yet registered through DSPS, please make sure to contact them as soon as possible, as I am not able to provide accommodations without a written notice from that office. The DSPS website is found at www.deanza.edu/dsps.

Academic Integrity

Homework assignments are an opportunity to learn and practice the course material, and you should feel free to make use of resources that will help you to understand problems you are uncertain about, including your textbook, the course lecture videos or other tutorials, or outside tutors. You should make sure however that you are in fact using these resources to help you understand how to approach the problems, rather than simply entering the problem text into a search engine and copying any solutions you find.

Course exams are a time to demonstrate your own independent knowledge of the course content, and your use of outside help to assist you in answering exam questions is limited to specifically approved materials. Consultation with another person in answering exam questions, whether in person or via the internet, is considered cheating and will be handled as described below. The same is true for uploading any portion of an exam to an online homework help service (Chegg, CourseHero, etc.), whether during or after the exam period. You will always be provided with keys to course exams once they are returned to you, but posting exam questions online permission is a violation of both De Anza academic integrity policies and copyright law.

Cheating or plagiarizing in any form including but not limited to those above will not be tolerated. The first offense of academic dishonesty will result in a zero for the relevant exam or assignment, which may lead to failing the course. The offending student will also be reported to the Dean of Student Development, which may result in additional administrative consequences. For a fuller description of what constitutes a violation of academic integrity, see the De Anza College academic honor code the link below:

- www.deanza.edu/policies/academic_integrity.html

LECTURE SCHEDULE – CHEM 30A SPRING 2022

| Week | Dates | Lecture Content (Watch videos <u>before</u> coming to lecture) | Textbook Sections (Ball et al.) | Textbook Sections (Smith) | Homework Due (Saturday by 11:59 pm) |
|------|-----------|---|---|-----------------------------------|-------------------------------------|
| 1 | 4/3-4/9 | FLEX DAY - NO MONDAY LECTURE Parts 1-2 | 1.1-1.7, 2.1, 7.1-7.1 | 1.1-1.10, 2.1, 7.10 | Parts 1 & 2 (4/9) |
| 2 | 4/10-4/16 | Parts 3-4 | 2.2-2.8, 5.5-5.6 | 2.2-2.7, 6.1 | Parts 3 & 4 (4/16) |
| 3 | 4/17-4/23 | Monday, 4/18: Exam 1 Review Wednesday, 4/20: EXAM 1 | | | |
| 4 | 4/24-4/30 | Parts 5-6 | 3.1-3.4, 4.1-4.5, 5.1-5.2, 5.5 | 3.1-3.6, 4.1-4.6, 5.1-5.4 | Parts 5 & 6 (4/30) |
| 5 | 5/1-5/7 | Part 7 | 5.3, 6.2-6.5 | 5.7-5.10 | Part 7 (5/7) |
| 6 | 5/8-5/14 | Part 8 | 7.3, 8.1-8.2 | 4.7-4.8, 7.1-7.7, 7.11-7.12 | Part 8 (5/14) |
| 7 | 5/15-5/21 | Monday, 5/16: Exam 2 Review Wednesday, 5/18: EXAM 2 | | | |
| 8 | 5/22-5/28 | Part 9 | 8.3-8.4 | 7.1-7.5 | Part 9 (5/28) |
| 9 | 5/29-6/4 | MEMORIAL DAY - NO MONDAY LECTURE Parts 10-11 | 9.1-9.4, 10.1-10.5 | 8.1-8.8, 9.1-9.10 | Parts 10 & 11 (6/4) |
| 10 | 6/5-6/11 | Monday, 6/6: Exam 3 Review Wednesday, 6/8: EXAM 3 | | | |
| 11 | 6/12-6/18 | Parts 12-13 | 11.1-11.5 | 10.1-10.6 | Parts 12 & 13 (6/18) |
| 12 | 6/19-6/25 | FINAL EXAM Afternoon Sections: <ul style="list-style-type: none"> • Wednesday, 6/22, 1:35-3:45 pm Evening Sections: <ul style="list-style-type: none"> • Friday, 6/24, 6:15-8:15 pm | | | |

LAB CALENDAR – CHEM 30A SPRING 2022

| Week | Dates | Lab Exercise (Prelab assignments are due before the start of lab) | Lab Due Date (Following Saturday by 11:59 pm) |
|------|-----------|---|---|
| 1 | 4/3-4/9 | FLEX DAY - NO LAB FOR MONDAY SECTIONS Check-In (Wednesday sections only) | 4/16 |
| 2 | 4/10-4/16 | Measurements | 4/23 |
| 3 | 4/17-4/23 | Nomenclature | 4/30 |
| 4 | 4/24-4/30 | Lewis Structures and Shapes of Molecules and Ions | 5/7 |
| 5 | 5/1-5/7 | Hydrate | 5/21 |
| 6 | 5/8-5/14 | Hydrate (cont.) | 5/21 |
| 7 | 5/15-5/21 | Molar Volume of a Gas | 5/28 |
| 8 | 5/22-5/28 | Conductivity | 6/4 |
| 9 | 5/29-6/4 | MEMORIAL DAY - NO LAB FOR MONDAY SECTIONS Vinegar Titration (Wednesday sections only) | 6/11 (Wed lab) |
| 10 | 6/5-6/11 | Vinegar Titration (Monday sections only) Check-Out (Wednesday sections only) | 6/18 (Mon lab) |
| 11 | 6/12-6/18 | Comprehensive Lab Exam | |
| 12 | 6/19-6/25 | FINALS WEEK – NO LAB | |

Student Learning Outcome(s):

*Solve stoichiometric problems by applying appropriate molar relationships.

*Identify the differences between elements and compounds and describe the chemical bonding in compounds- ionics vs. covalent.