

Chemistry 1A: General Chemistry**Summer 2021**

Dr. Brophy

**CHEM 1A CRN 00209****Synchronous Class Meetings: MTuWTh 5:30 pm – 6:45 pm***Class meetings will not be recorded.*

The first class meeting will be Monday, June 28th at 5:30 pm. This class meeting is strictly mandatory, and I will drop any no-shows by 6:45 pm.

Instructor: Dr. Megan Brunjes Brophy*Please contact me through the **Canvas Inbox** for all course-related communications.***Course Webpage:** Canvas.*Turn on Canvas notifications to receive class announcements.***Office Hours:***By appointment only. Please send me a message in Canvas to set up a time to meet. I am generally available after class on weeknights.***Zoom:** ***Please see Canvas for Zoom meeting information*****Important Dates**

Add Day	June 30, 2021	Last day to <i>add</i> .
Refund Day	June 29, 2021	Last day to <i>drop</i> the course and receive a refund.
Drop Day	July 1, 2021	Last day to <i>drop</i> the course without receiving a "W"
Withdraw Day	July 28, 2021	Last day to withdraw from the course.
Last Day	August 5, 2021	Last day of class. No work will be accepted for grading after 6:45 pm on this day.

June 29th Drop Day

The Chemistry 1A program at De Anza College is heavily impacted, and waitlists are typically full. In order to keep your spot in the class, you must submit the following assignments through Canvas in a timely manner.

- Values survey
- Lab safety contract

If either of these assignments has not been submitted by **6:45 pm on June 29th**, I will drop you from the course.

Attendance Requirements

Your punctual and attendance during all synchronous class sessions is strictly required during the first week of the class. You must arrive on time (within the **first 5 minutes** of class) and participate during class sessions for your attendance to be recorded. If you try to enter the zoom class after that 5-minute window, I cannot guarantee that I will see you in the waiting room. If you will have to miss a meeting for any reason, let me know by e-mail or phone as soon as possible. Notifying your instructor of absences or tardiness shows that you take your responsibility towards yourself and your fellow students seriously. *If you do not satisfy the attendance requirement, you will be dropped from the course.*

Academic Integrity

The process of learning requires physical changes to occur in your brain. Cognitive research demonstrates that consistent practice and learning to recognize mistakes are key aspects of the learning process. As such, all students should be aware of the De Anza College policy on academic integrity outlined at https://www.deanza.edu/policies/academic_integrity.html. The following text is reproduced from the De Anza College manual:

the college is committed to providing academic standards that are fair and equitable to all students in an atmosphere that fosters integrity on the part of student, staff and faculty alike. The student's responsibility is to perform to the best of his or her potential in all academic endeavors. This responsibility also includes abiding by the rules and regulations set forth by individual faculty members related to preparation and completion of assignments and examinations.

I expect that all work submitted for this class will represent your own understanding of the material and must be written in your own words. Cheating, copying, plagiarizing, etc. will not be tolerated. Due to the "online" nature of the class, students must take extra care to abide by the policies and expectations set forth for each assignment. While it is tempting to use the full weight of the internet, some sources may provide misleading or corrupt information. Students should focus on the required reading and recommended resources for the class, and any other sources must be vetted by the instructor. Tutoring resources are allowed for homework assignments; however, using a paid, static resource is forbidden. This can be particularly challenging as some websites that profess to provide tutoring services are actually destructive to the learning process. A good rule-of-thumb is that any tutoring service will help you solve a problem and arise at an answer *on your own*—this means that your brain is making new physical connections between neurons, and you are learning! If an online source professes to offer tutoring, but instead provides you with answers, this is cheating. The websites Chegg, CourseHero, Reddit, as well as any similar site are explicitly forbidden for all class assignments. Posting class assignments on these websites is considered intent to cheat. I am happy to discuss appropriate resources with you, and I encourage you to ask for permission rather than forgiveness.

You may collaborate with your classmates on lecture homework assignments; however, the final work that you submit must reflect your own understanding of the material. Do not allow any other student to copy your work under any circumstance. If a student asks if they can copy your work or "just see it as an example", ask them to reach out to the instructor for help. If two students turn in the same work, both students will have participated in academic dishonesty.

Class assessments are used to measure an individual student's mastery of the material. They are all closed resource, and you will be provided with any physical constants or additional information as necessary. A common mistake that past students have made is to Google a question and copy an answer from the internet—this behavior is forbidden, and the consequences are described below. If I suspect cheating on a quiz, you will be required to meet with me face-to-face.

Any incident of cheating or plagiarism, no matter how minor, will be reported to the Dean of Student Development and the Dean of the Physical Sciences, Mathematics, and Engineering division. Administrative consequences are summarized in the college manual. Additional consequences will be applied to your course grade. **The first incident of academic dishonesty will result in zero points on the assignment, a grade penalty of up to 8% to be deducted from your final grade, and loss of any extra credit points for the quarter.** Any subsequent instances of academic dishonesty *no matter how minor* will result in failing the class. In short, academic dishonesty will have a negative impact on your grade and may result in disciplinary probation or expulsion. If academic dishonesty is discovered within two-years of your completion of the course, your official grade will be changed.

I recognize that these consequences may sound scary. I am committed to supporting you and your learning process. If you require an extension on any assignment, please reach out to me to arrange appropriate accommodations. Our class meetings are dedicated to working through practice problems, and I encourage you to bring questions and utilize the discussion boards for additional feedback. If you are not sure if a resource is allowed, or if something feels "off" to you, alert your instructor right away. I do reserve the right to make major changes to the class structure—including requiring an oral exam / exit interview—if there are class-wide violations of the academic integrity policy.

Required Materials: Lecture

- **Chem101 (\$22.95)** We will use Chem101 as our online homework and in-class practice problem platform this quarter. *You must sign up for a Chem101 account before the second class meeting—you will lose points if you*

don't have Chem101 during the second lecture! You will have complimentary access to Chem101 for the first two weeks of the quarter. After this period, Chem101 costs \$22.95 for the first quarter you use it, and \$17.95 for subsequent quarters.

- **Textbook** *Chemistry: The Molecular Nature of Matter and Change, 9th edition by Silberberg and Amateis. There are multiple purchasing options available to you, and you should consider your future chemistry plans at De Anza College when making a decision. Please note that we will not use McGraw-Hill Connect or ALEKS this quarter, so you do not need to purchase access to these platforms for the Fall 2020 quarter. Some faculty in the department use these platforms, and you may require access for Chemistry 1B or Chemistry 1C.*
 - *Purchase a used, old copy (any edition) from Amazon, eBay, or a former student (cost will vary). Each edition of Silberberg is more-or-less the same, although some practice problems may vary in numbering or content. This is likely your least expensive option for this quarter; however, you will not have future access to Connect or ALEKS.*
 - *eBook Access for Chemistry 1A chapters (\$30). This option may be purchased using the ISBN 9781307600940 at <http://create.mheducation.com/shop>. This ISBN only includes the chapters that we are using for Chemistry 1A (1–4, 6–11). I encourage you to consider this option if Chemistry 1A is the only chemistry course you plan to take at De Anza College. Here are additional instructions to purchase this option: [eBook CreditCard 2015.pdf](#)*
 - *eBook access + Connect + ALEKS for 365 days (\$90). This is a good option if you plan to take Chemistry 1B and Chemistry 1C during the 2020–2021 academic year. You should find this purchase option at <https://connect.mheducation.com/class/m-brophy-chemistry-1a-summer-2021>*
 - *eBook access + Connect for 90 days (\$45). This probably isn't the most useful option for this quarter as we will not have any Connect homework.*
 - *Temporary 14-day access to Connect and eBook. No matter what option you are leaning towards, you can sign-up for temporary 14-day access at <https://connect.mheducation.com/class/m-brophy-chemistry-1a-summer-2021>*
- **Hands-On-Labs Kit** You will be expected to order a lab kit from Hands-on-Labs from the bookstore as soon as July 1st and no later than July 6th. *The kit will be provided to you by De Anza College at no additional cost.* You will need to provide your mailing address to the bookstore to receive the kit. If you currently reside outside of California, you may need to arrange expedited shipping through the bookstore. If you currently reside outside of the US, you will also be responsible for any necessary customs forms.

When your kit arrives, you are responsible for taking a complete inventory of the kit and notifying HOL and bookstore of any missing and broken components so that you can receive a replacement in a timely. You are responsible for the contents of your kit for the duration of the class.

- **Calculator** A scientific calculator with natural log functionality is necessary and sufficient for this class. If you have already purchased a graphing calculator for another class, you may use it on exams and quizzes; however, *we will not use the graphing functionality.* Recommended models:
<https://www.amazon.com/Texas-Instruments-MultiView-Scientific-Calculator/dp/B000PDFQ6K>
https://www.amazon.com/dp/B005QXO8J0/ref=dp_cerb_3
I do not recommend using Google as a calculator. There have been recent reports of the unit conversion function “breaking”, and performing the order of operations correctly is non-trivial. Similarly, calculator apps on your phone can be cumbersome to use quickly.
- **Computer and printer access.** All Winter 2021 classes at De Anza College are being conducted online due to the COVID-19 crisis. You will require a computer with reliable internet access throughout this course.
- **Genius Scan** Throughout the quarter, you will turn in handwritten assignments by creating a PDF file and uploading this file to Canvas. Recommended apps include GeniusScan and CamScanner. *Do not use any Adobe apps to turn your assignments in—the files end up being too big for me to read!*

Campus Resources

- **De Anza College Library** The library remains closed as of this writing; however, online resources can be found at <https://www.deanza.edu/library/>
- **Math, Sciences, and Technology Resource Center (MSTRC) Tutoring.** The MSTRC offers online tutoring over Zoom for the Chemistry 1 sequence.
<https://www.deanza.edu/studentsuccess/mstrc/>

- **Online Tutoring** Please visit <https://www.deanza.edu/studentuccess/onlinetutoring/> for more information.
- **Disability Support Programs Services** The mission of DSPS is to ensure access to the college's curriculum, facilities, and programs. In particular, DSPS can help you get extended time on examinations.
<https://www.deanza.edu/dsps/>
- **Resources for Students** Additional resources may be found at <https://www.deanza.edu/services/>

I expect you to use the resources available to you, share resources with your classmates, and ask for help when needed.

Syllabus Statement

This course syllabus is a contract. Please read it carefully and completely in its entirety before asking me any questions regarding the course schedule, content, requirements, grading, etc. You are expected to adhere to the De Anza College Student Code of Conduct Administrative Policy 5510 at all times. This syllabus is a living document, and **all corrections and changes to this syllabus will be announced through Canvas.**

This class is divided into two separate instructional periods: a lecture period devoted to the primary course material and a lab period for conducting lab experiments. Everyone will have the same lecture period, but a different lab period depending on which section you are enrolled in. At De Anza College, the lab and lecture may not be taken as separate courses under any circumstances. For online delivery during the summer 2021 quarter, we will have one class meeting that will cover both lecture and lab material.

Official Course Description

An introduction to the structure and reactivity of matter at the molecular level. Application of critical reasoning to modern chemical theory and structured numerical problem solving. Development of molecular structure from rudimentary quantum mechanics, including an introduction to ionic and covalent bonding. Chemical problem solving involving both formula and reaction stoichiometry employing the unit analysis method. An introduction to thermochemistry and a discussion of the first law of thermodynamics.

Prerequisites

CHEM 25 or CHEM 30A or satisfactory score on Chemistry Placement Test; MATH 114 or equivalent.

Hours

This class will meet synchronously from 5:30 pm – 6:45 pm Monday – Thursday. In addition to these synchronous hours, you should **expect to spend an additional 30–40 hours a week studying and working on class assignments in order to master the material.**

Course Objectives

- A. Examine contributions by investigators of diverse cultures and times to the body of chemical knowledge, with an emphasis on physical and chemical conceptual frameworks.
- B. Investigate the critical aspects of measurement.
- C. Explore the historical development of understanding the structure of the atom.
- D. Assess the development of the Periodic Table of Elements in light of modern atomic theory.
- E. Differentiate the causes and types of molecular bonding.
- F. Appraise the effect of quantum mechanics on formulation of molecular structure.
- G. Employ systematic nomenclature to the identification of molecules.
- H. Utilize the principles of stoichiometry to analyze compounds, chemical mixtures, and reactions.
- I. Examine the prominent characteristics of solutions.
- J. Classify the major types of chemical reactions.
- K. Apply the essential principles of thermodynamics to chemical systems.

Attendance Policy

Your *punctual* attendance is expected at all lecture and laboratory sections of the course. In order to be counted “present” and receive credit for that day’s activities, you must arrive during the first 5 minutes of class. If you try to enter the zoom class after 5:35 pm, I cannot guarantee that I will see you in the waiting room. If you will have to miss a class session for any reason, let me know by e-mail or phone as soon as possible. Notifying your instructor of absences or tardiness shows that you take your responsibility towards yourself and your fellow students seriously.

Late work will not be accepted under any circumstances. In the case of a documented emergency (e.g. hospitalization, court appearance, car crash), I may excuse you from that day’s work. These instances will be handled and decided on a case-by-case basis.

Grading Breakdown and Expected Grade Scale

To succeed in this course, you will need to exhibit consistent and sustained effort throughout the quarter. This will be demonstrated through in-class practice problems, laboratory analysis, and examinations. Assignment types are assigned a weight; not all points are created equally!

Assignment Category	Percentage of Final Grade ^{1,2}
Lecture Assignments	15%
Lab Assignments	30%
Assessments	15%
Lab Final	15%
Final Project	25%

¹ If you end the quarter with less than 60% in any assignment category, including the lab final and/or final project, you will receive an F in the class.

² The weights of these assignment categories may change. For example, if there are repeat violations of the academic integrity policy, this scale will be adjusted such that the final project will be worth a larger portion of your grade.

The grade scale is as follows. A minimum grade of 70% is required to pass the class, and your final grade must be at least 93% in order to receive an A. A grade of C indicates that you have sufficiently mastered the skills and material necessary to take Chemistry 1B.

Percentage in Class	Grade ¹
≥ 93%	A
90 – 92.9%	A–
87 – 89.9 %	B+
83 – 86.7%	B
80 – 82.9%	B–
77 – 79.8%	C+
70 – 76.9%	C
65 – 69.9%	D+
60 – 64.9%	D
<60%	F

NOTE: Dr. Brophy reserves the right to alter the grade scale at any point in the quarter. Any changes will be clearly announced through Canvas.

Study Tips

1. Complete the assigned reading before coming to class. Write down any vocabulary words that you do not understand as well as their definitions.
2. Take *handwritten* notes during class and review your notes regularly. Write down any questions you have and bring them to office hours or e-mail your instructor.
3. ***Do a little bit every day.*** After every lecture, review the reading assignment and complete in-chapter and end-of-chapter exercises.
4. Join a study group. Work on problem sets together. The best way to learn the material is to teach it to somebody else.
5. If you feel that you are a poor test-taker, ***complete and turn in all assignments on time*** in order to pass the class.
6. Take care of yourself! Stay well-rested and drink water.

Assignment Descriptions

Your attendance and active participation is expected at every lecture period. **Due to the high number of students wishing to enroll in the course, any unjustified absences during the first two weeks of class will result in you being dropped from the course.** Absences may be excused in case of a verified emergency (e.g. doctor's note or police report). If you know that you will not be able to attend lecture for any reason, let me know by email right away (even if only 5 minutes before class). Late arrivals and early departures are distracting for the whole class (and me!), so arrive on time and stay for the whole class period. I strongly encourage taking your own notes in lecture. Put your phone on silent or Do Not Disturb while you are in class.

CHEM101 Homework and In-Class Activities

We will use Chem101 as our online homework and "clicker" system during the summer quarter. You must sign up for a Chem101 account on the first day of class. The cost of Chem101 is ~\$23. Once you sign up for an account, there is a two-week grace period before you must purchase access for the remainder of the quarter.

In general, homework assignments will be posted on Mondays and due the following Sunday at 11:59 pm. Each homework question is worth 1 point.

Each in-class question will be worth 5 points, and the number of questions will vary each day. **Make sure you attend every class session to receive credit.** If at any point during the Zoom sessions, you leave or do not participate, I reserve the right to eject you from class for the day and you will receive zero points for all of the day's activities. If you need to leave or step away for any reason, send me a message in the Zoom chat with your expected return time.

Lab Assignments

All work that you submit must be handwritten unless otherwise specified, and all work for your calculations must be shown. Labs must be completed in order through the HOL platform

Assessments

Weekly assessments will occur during synchronous class time on the following dates:

- July 6 (Tuesday of Week 2)
- July 13 (Tuesday of Week 3)
- July 20 (Tuesday of Week 4)
- July 27 (Tuesday of Week 5)
- August 3 (Tuesday of Week 6)

Assessments will take place during the first 30 minutes of the class period. The format of assessments will vary based on the material being tested. Details for each assessment will be announced in advance. Assessments are closed resource. Any physical constants or additional information necessary will be provided to you.

Lab Final

The lab portion of the class will evaluate experimental design, critical thinking, and data analysis. The Additional details will be announced later in the quarter.

Final Project

For your final project for Chemistry 1A, you will choose a current chemistry-related topic and write an original exam question based on this topic. This is in place of having a traditional, multi-question final exam. The final project will be worth 15% of your final grade, and we will have several checkpoints throughout the quarter. You may choose from among the following topics that are covered in chemistry 1A:

- I) Chemical reactions and reactivity
- II) Energy transformations
- III) Light / matter interactions
- IV) Atomic structure and electron configurations
- V) Molecular structure and polarity

You may *not* choose an article/topic that is related to molecular bonding (hybridized orbitals or molecular orbital theory) as this material is not introduced until the last week of the quarter.

The inspiration for your question should come from a current discovery and news article. Your article may come from a major newspaper or science-specific blog. Recommended resources include:

- The New York Times <https://www.nytimes.com/section/science> (Should be available through the DAC library)
- NPR <https://www.npr.org/sections/science/>
- KQED <https://www.kqed.org/science>
- BBC News https://www.bbc.com/news/science_and_environment
- National Geographic <https://www.nationalgeographic.com/>
- Chemistry World <https://www.chemistryworld.com/>
- The Guardian <https://www.theguardian.com/science>
- C&ENews <https://cen.acs.org/index.html> (Ask Dr. Brophy for specific articles once you run through your 3 free articles for the month)
- Scientific American <https://www.scientificamerican.com/>

This list is not exhaustive, and there are many other reliable resources that you may draw from. However, your article must come from an English-source so that I can read and evaluate it. You should select **three** articles of interest and submit them via Canvas between July 19 and July 22. The article that you use for your final project must be approved by Dr. Brophy.

The final project will include the following components:

- I) A link to your chosen article as well as a ca. 200-word summary of the article.
- II) An original “exam” question inspired by the article. The question should contain multiple parts and be quantitative and qualitative. At least one calculation should be involved.
- III) An explanation of how the exam question relates to the article.
- IV) The answer key for your exam question, including all relevant steps and explanations.
- V) A list of mistakes you anticipate a student might make as well as guidance on how to grade those mistakes.
- VI) An explanation of how your exam question relates to the course material as well as what *you* learned by completing the final project.

The final will be graded based on the student’s interpretation of the article, originality and appropriateness of the exam question, and the metacognition displayed by the student’s analysis of the question. Additional details will be announced later in the quarter.

Student Learning Outcome(s):

- *Identify and explain trends in the periodic table.
- *Construct balanced reaction equations and illustrate principles of stoichiometry.
- *Apply the first law of thermodynamics to chemical reactions.