Chemistry 25: Preparation Course for General Chemistry Winter 2020

Dr. Brophy

CHEM 25 CRN 33764 Lecture: MW 5:30 pm – 7:20 pm in S34
Lab: W 7:30 pm – 10:20 pm in SC2208

Instructor: Dr. Megan Brunjes Brophy
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Office: SC1220 (dial 8338 from door phone)
Phone Number: 408-864-8338

*Please note that **e-mail and Canvas** are the most reliable ways to get in touch with me outside of class and office hours.*

Course Webpage: Canvas.
Turn on Canvas notifications to receive class announcements.

Office Hours:
M 1:30 – 2:20 pm in S43
W 1:30 – 2:20 pm in S43
F 8:30 am – 10:10 am in S43

And by appointment

Zoom: https://cccconfer.zoom.us/my/drbrophy

Please e-mail to schedule a meeting in-person or over Zoom.

Important Dates

Add Day	January 18, 2020	Last day to *add*.
Drop Day	January 19, 2020	Last day to *drop* the course without a withdraw being recorded.
Withdraw	February 28, 2020	Last day to *withdraw* from the course.

Exam Dates
There will be three midterm exams and one cumulative final exam. The date of the final exam is determined by the college and cannot be moved.

January 27, 2020	Midterm Exam 1
February 24, 2020	Midterm Exam 2
March 16, 2020	Midterm Exam 3
March 23, 2020	Final Exam

Mandatory Lab Days

January 8, 2020	Safety lecture and check-in
March 18, 2020	Lab checkout day and lab final. *If you drop or withdraw from the course, you must check out of your lab locker during the designated lab check-out day and time. Failure to do so may result in a charge to your account.*

Required Materials: Lecture

- **Textbook** *Introduction To Chemistry*, 5th edition by Bauer, Birk, and Marks
  We will **not** use online homework in this class, and you will not require access to McGraw-Hill Connect. You may use any edition of the textbook in any format.

- **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
- **Index Cards** A pack of 100 3x5 inch index cards. *Bring these with you to every class.*
- **Computer and printer access** You will require internet access and a printer throughout this course. The Library West Computer Lab is located on the lower level of Learning Center West in LCW 102. Printing can be found around campus: https://www.deanza.edu/students/printing.html
- Stapler and staples

Required Materials: Lab

- **Lab Manual** *Laboratory Manual for Preparation for General Chemistry* by Applegate, Neely, and Sakuta.
- **Personal Protective Equipment**
  - Approved laboratory safety goggles (not safety glasses), available from the De Anza College Bookstore. Safety goggles must be ANSI-rated. If you purchase safety goggles from another retailer you must present the packaging with verification of ANSI rating to your instructor.
  - Disposable latex or nitrile gloves.
  - A lab coat or lab apron (*optional*).

Supplemental Texts

- *Calculations in Chemistry an Introduction*, 2nd edition by Dahm and Nelson. Available at many online retailers (https://www.amazon.com/Calculations-Chemistry-Introduction-Donald-Dahm/dp/0393614360/ref=dp_ob_title_bk)

Campus Resources

- **Math, Sciences, and Technology Resource Center (MSTRC) Tutoring.** The MSTRC offers tutoring for the Chemistry 1 sequence and is located in room S43 in the S-quad. Furthermore, I will hold office hours in S43 this quarter.
  https://www.deanza.edu/studentsuccess/mstrc/
- **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/
- **De Anza College Library** The library houses the Library West Computer Lab and group study rooms that may be reserved online.
  https://www.deanza.edu/library/index.html
- **Resources for Students** Additional resources may be found at https://www.deanza.edu/services/
- **Office Hours** Instructor office hours are the best time to ask questions related to course content in-person. This time is *for you, the student*.

Grade Scale

Lecture Exams *3 total, 100 points each*	300 points
Lecture Final	100 points
Quizzes *25 points each* *Lowest score dropped*	100 points
Exit Tickets	50 points
Pre-labs *5 points each*	45 points
Lab worksheets *10 points each*	100 points
Lab Final	100 points
	795 points

Final Points	**Grade**
787 – 795	A+
715 – 786	A
700 – 714	A–
675 – 699	B+
636 – 674	B
620 – 635	B–
596 – 619	C+
540 – 595	C
500 – 540	D+
437 – 499	D
<437	F

You must complete all lab assignments in order to pass the class

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. ***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.

Course Description
An introduction to the core theory and problem-solving techniques of chemistry as preparation for Chemistry 1A and other science-related fields. An introduction to gravimetric and volumetric analysis, rudimentary laboratory equipment and operations, and the preparation and maintenance of a laboratory notebook.

Prerequisites
Math 114 or equivalent. EWRT 1A or EWRT 1AH or ESL 5.

Hours
Four hours lecture and three hours laboratory will be spent in class. ***Expect to spend an additional 12–16 hours a week studying and working on class assignments***.

Attendance Policy
Your *punctual* attendance is expected at all lecture and laboratory sections of the course. *Plan to arrive 5-10 minutes early.* If you will have to miss lecture or lab 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.

The De Anza College Chemistry Department does not offer make-up labs under any circumstances. ***If you miss 3 or more lab periods you will automatically fail the course.*** Even if you miss a lab period, you must complete the assignment.

Study Tips
1. Complete the assigned reading before coming to class. Review 1A and 1B topics that are unfamiliar. 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-taken, *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.

Academic Integrity
Students are expected to adhere to the policy on academic integrity that is outlined in the De Anza College manual (https://www.deanza.edu/studenthandbook/academic-integrity.html). ***I expect all submitted work to represent your own understanding of the material and to be written in your own words.*** Cheating, copying, plagiarizing, etc. will not be tolerated, and the minimum consequence will be receiving a zero on that assignment and the incident will be reported to the Dean of Student Services. All laboratory data used in calculations and reported in lab reports must be collected by each student. Multiple instances of academic dishonesty may result in failing the course.

Lecture

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. Computers are not necessary during lecture. Do not use your computers for non-course related activities during lecture. Put your phone on silent or Do Not Disturb while you are in class. If you must take a phone call in case of emergency, quietly leave the room before answering the phone.

Recommended practice problems

Consistent practice is an essential component of learning, and homework questions will often be similar to exam questions. Recommended practice problems from the textbook will be posted for each chapter; however, homework will *not* be graded. In general, the answers to these questions may be found in the back of the textbook and solutions are readily available online. It is your responsibility to keep up with suggested practice problems *every day*. *Collaboration with classmates is expected and encouraged.*

Collected lecture assignments

Lecture assignments will be collected and graded for completion. Bring your index cards, loose leaf paper, and a writing utensil to class with you.

Exams

There will be three midterm exams, each worth 100 points. Early and late exams will not be administered, and **missing an exam will result in a zero without documented proof of a medical or legal emergency** (e.g. hospitalization or car crash). If you require any accommodations for exams, you must be approved by DSPS.

Exams will consist of short answer questions with the opportunity for partial credit. You must show your work in order to receive credit for any answer. I am more interested in how you think about a problem than your final answer. You will be asked to demonstrate your conceptual understanding of the material and apply those concepts in an algebraic context and solve quantitative problems.

Quizzes

There will be five quizzes, each worth 25 points. Your lowest quiz score will be dropped from your final grade. Quizzes will be administered promptly at the beginning of lecture. Early and late quizzes will not be administered, and missing a quiz will result in a zero. If you require accommodations for quizzes, you must be approved by DSPS.

Final

The final exam will be cumulative. The final exam will be administered on **Monday, March 23rd from 6:15 pm – 8:15 pm**. This date and time are determined by De Anza College and cannot be moved under any circumstances. If you cannot take the final at this time, you should not enroll in the class. The final will not be administered at an alternative time under any circumstances.

Lecture Schedule and Assigned Readings
Chemistry 25 will cover material presented in chapters 1–6, 8, 9, 13, and 14 of Bauer, Birk, and Marks.

Detailed reading as well as recommended practice problems related to each lecture will be announced in class.

Every effort will be made to keep to the lecture schedule below. If we fall significantly behind this schedule, the content of the exams will be adjusted to reflect the material that we covered in class. Exam dates will not be modified except in cases of *force majeure*.

Week	Date	Day	Lecture Topics and Assigned Reading	Lab (Wednesday Only) ***Preparation for General Chemistry Lab Manual (Applegate, Neely, and Sakuta)***
1	1/6		Introduction The Chemical Nature of Matter *Bauer, Birk, and Marks 1.1–1.3*	
	1/8		Scientific Inquiry *Bauer, Birk, and Marks 1.4* Math Tools: Scientific Notation, Significant Figures, Units and Conversions *Bauer, Birk, and Marks Math Toolbox 1.1–1.3*	Lab Safety Check-in Math Module *Page 11*
2	1/13		**Quiz 1 *Chapter 1 (20 minutes)*** Atomic Theory *Bauer, Birk, and Marks 2.1 – 2.2* Ions *Bauer, Birk, and Marks 2.3*	
	1/15		Atomic Mass *Bauer, Birk, and Marks 2.4* The Periodic Table *Bauer, Birk, and Marks 2.5*	Measurements, Significant Figures, and Calculations *Page 21*
3	1/20		*NO CLASS – Martin Luther King, Jr. Holiday*	
	1/22		Chemical Compounds *Bauer, Birk, and Marks 3.1 –3.7*	Density and Specific Gravity *Page 39*
4	1/27		**EXAM 1: Chapters 1–3** **110 minutes**	
	1/29		Chemical Composition *Bauer, Birk, and Marks 4.1* The Mole *Bauer, Birk, and Marks 4.2* *Bauer, Birk, and Marks Mathtoolbox 4.1* Determining Empirical Formulas *Bauer, Birk, and Marks 4.3*	Atomic Structure and Periodic Properties *Page 53*
5	2/3		**Quiz 2 *Sections 4.1 – 4.3 (20 minutes)*** Solutions and Solution Calculations *Bauer, Birk, and Marks 4.4*	
	2/5		Chemical Reactions *Bauer, Birk, and Marks 5.1 – 5.2* Chemical Equations *Bauer, Birk, and Marks 5.3 and 5.3*	Ionic Compounds: Their Names and Formulas *Page 69*
6	2/10		**Quiz 3 *Sections 4.4, 5.1–5.3, 5.5*** Classifying Chemical Reactions *Bauer, Birk, and Marks 5.4* Using Balanced Chemical Equations *Bauer, Birk, and Marks 6.1–6.3*	
	2/12		Limiting Reactants and Percent Yield *Bauer, Birk, and Marks 6.4 – 6.5*	Empirical Formulas of Compounds *Page 117*

7	2/17		*NO CLASS – President's Holiday*	
	2/19		Energy Changes Thermodynamics *Bauer, Birk, and Marks 6.6 – 6.7*	Chemical Reactions *Page 101*
8	2/24		**EXAM 2: Chapters 4 – 6** **110 minutes**	
	2/26		Chemical Bonds *Bauer, Birk, and Marks 8.1–8.8.3* Molecular Geometry *Bauer, Birk, and Marks 8.4 –8.5*	Covalent Compounds: Their Names, Formulas, and Shapes *Page 85*
9	3/2		**Quiz 4 *Chapter 8 (20 minutes)*** Gases and Gas Laws *Bauer, Birk, and Marks 9.1–9.3* *Math Toolbox 9.1–9.2*	
	3/4		Gases in Chemical Reactions *Bauer, Birk, and Marks 9.5* *Math Toolbox 9.1 – 9.2*	Gas Laws *Page 131*
10	3/9		**Quiz 5 *Chapter 9 (20 minutes)*** Acid-Base Reactions *Bauer, Birk, and Marks 11.1, 11.4–11.5* *Bauer, Birk, and Marks Chapter 13*	
	3/11		Acid-Base Reactions *Bauer, Birk, and Marks Chapter 13*	Titration of the Acid Content in Vinegar *Page 143*
11	3/16		**EXAM 3: Chapters 8, 9, 13**	
	3/18		Oxidation Reduction Reactions Acid-Base Reactions *Bauer, Birk, and Marks Chapter 14*	**Check-out** **Lab Final**
12	3/23	M	**FINAL EXAM** **6:15 – 8:15 pm**	

Lab

Chemistry is an experimental science, and the laboratory is a major component of the course. De Anza College does not offer make-up labs, and ***you must attend the laboratory section that you are registered for*** to complete the required

labs. Everyone gets one excused absence with no grade penalty. A second absence, regardless of the circumstances of your first absence, will result in a zero for the lab and all associated assignments. After a third lab absence, you will automatically receive an "F" in the course.

Your timely attendance is expected at every lab. The beginning of each lab period is reserved for lab lecture. The lab lecture is a required component of the laboratory section and will include essential safety information. ***If you miss lab lecture, you will not be permitted to complete that lab and you will receive a zero for all related assignments***.

You must clean up your work area before leaving each lab. Failure to do so will result in a loss of points for that lab. Before you leave lab, check-out with me. You will not receive credit for the lab unless I have signed your data.

Laboratory Safety

All chemistry laboratories inherently come with associated risks and hazards. It is inevitable that some accidents will occur during your chemistry course work. When an accident occurs, ***inform your instructor immediately*** and ***do not attempt to clean-up any broken glassware or spilled chemicals by yourself.*** In order to ensure that the lab is as safe as possible, we must (1) ***Recognize hazards***, (2) ***Assess the risks of hazards***, (3) ***Minimize the risks of hazards***, and (4) ***Prepare for emergencies***.

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. In extreme cases, you may lose your lab privileges for the remainder of the quarter.

Student Learning Outcome(s):

*Assess the fundamental concepts of modern atomic and molecular theory.
*Evaluate the standard classes of chemical reactions.
*Demonstrate a fundamental understanding of mathematical concepts pertaining to chemical experimentation and calculations.