

CHEM 1062: Chemical Principles II

Fall 2023

3 Credits

<u>Instructor</u> Prof. Kyle Bantz (she/her) Bantz008@umn.edu	<u>Office Hours</u> Post on course Canvas page	<u>Course Meetings</u> 2:30-3:20 MWF 100 Smith Hall	<u>Course Website</u> https://canvas.umn.edu/courses/390674
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Overview

This course is designed as an undergraduate general chemistry course that provides a broad survey of chemistry. We will start with a discussion of kinetics, reaction rates, and the equilibrium condition, including how different factors influence equilibrium. We will use our understanding of equilibrium to focus on acid-base reactions, ionic compounds, and complex ions. Then, we will explore thermodynamics and how enthalpy, entropy, and free energy relate to reaction spontaneity. Finally, we will proceed into a discussion of electrochemistry and coordination chemistry.

During the term, students will complete weekly online homework assignments. There will be six unit quizzes, and at the end of the course, students will complete a cumulative final exam.

Chem 1061/5 and 1062/6 are introductory chemistry courses with accompanying lab courses. The two courses, with labs, are together designed to prepare a student for a major in science (including chemistry and engineering) and the health sciences. Each lecture/lab pair fulfills the core physical science requirement.

Prerequisites

In order to enroll in CHEM 1062, students must have earned a grade of C- or higher in CHEM 1061, 1071H, or 1081 (or an equivalent course).

If you do not meet these criteria, you should report your situation to the staff in Smith 115 at chemfaq@umn.edu immediately. They handle all registration issues pertaining to this course.

Goals

As a component of your undergraduate education here at the University of Minnesota, this course will offer you the opportunity to identify, define, and solve problems and will provide a strong foundation for the mastery of knowledge in the chemical sciences. Because CHEM 1062 is designed to prepare students for continuing studies in chemistry, when students leave the course they should demonstrate content mastery, the ability to solve a variety of multistep chemistry problems correctly and efficiently, and time and resource management. Let's look at each of these skills in turn and examine why they're important.

Content Mastery. We will learn about a variety of fundamental chemistry principles and phenomena, and our course content will be applicable in both your future coursework and the real world. In our class, you will demonstrate content mastery by completing homework assignments and earning points on quizzes. The bulk of the points in our class will come from this area.

Ability to solve a variety of multistep chemistry problems correctly and efficiently. This is important because it prepares you for the real-world career and employment skills needed beyond our course. For example, when a painter is hired to paint a single bedroom, the resident wants confidence the painter knows all of the steps to paint the room with the best possible outcome. It's not helpful for the resident if the painter perfectly paints the neighbor's bathroom

instead (not correct) or tears down the entire building, rebuilds it from scratch, and eventually paints the whole thing, including the bedroom (not efficient). In our class, you will demonstrate these skills by completing homework assignments and earning points on quizzes.

Time and resource management. Time and resources are ultimately limited in both the concrete and the abstract senses. This semester, you will have different pulls on your time and energy, whether it's your coursework, employment, family, personal life, extracurricular activities, etc., and **you get to decide how to manage and balance your different commitments, your time, and your resources most effectively for you and your overall goals.** Making these decisions and taking effective steps to reach your goals, though, can sometimes be overwhelming and does require practice. There are a number of resources designed to help you – please reach out to any and all that might be helpful for you! A list with many of these resources is provided on Canvas under the “I Need Help!” tab. Most students access resources like these at some point during their college careers.

For our class, the effectiveness of your study strategies and the amount of time and effort you spend each week engaging in course content, participating in in-class activities, working on homework, practicing course material on your own, and taking quizzes is in your control. However, **most students find that they need to rethink and reassess these strategies at some point during the semester, especially if they feel a quiz or assignment didn't go as well as expected.** In order to help you be efficient and successful in the course, including when you feel you need to choose a different approach, I've compiled a number of resources and have posted them on our course website. How (and if) you employ and implement these resources is also completely up to you, and you must seek out these resources and use them effectively.

Course Materials

All course materials are available for purchase from U of M Bookstores in Coffman Union and St. Paul Student Center.

Required

Textbook and ALEKS: *Chemistry, 9th edition*, Martin Silberberg and Patricia Amateis, McGraw-Hill 2021

Access to an internet-capable computer with Google Chrome, a working webcam, and working microphone

Laminated periodic table/equation sheet: used when you take quizzes and exams

Dry-erase marker: used when you take quizzes and exams

Recommended

Student solutions manual: *Chemistry, 9th edition* (free; available from the General Chemistry tutor room or from Prof. Bantz during office hours)

Non-programmable scientific calculator: used when you complete homework and quizzes; a built-in calculator is also provided within ALEKS for homework assignments and within Proctorio for quizzes

Inclusive Access

This semester we will be using the 9th edition of Silberberg/Amateis' *Chemistry with ALEKS*. You can access your E-text via the ALEKS link in our course Canvas site.

We are making the course material available because it is much more cost effective than purchasing the physical book. Your student account will be charged before the beginning of the semester for access. Those wishing to opt out (purchasing the textbook and ALEKS access elsewhere) are refunded after the drop/add period. All students who drop the course within the drop/add period will be automatically refunded.

An E-mail will be sent to all students with opt out instructions. The E-mail will have the subject line “Course Materials Charged on Your Student Account” and will come from verbasoftware.com. Sometimes the message goes to spam or junk folder, so please be on the lookout for this message. If you have any questions, contact the UMN Bookstore directly at inclusiveaccess@umn.edu

Course Websites

Lecture (CHEM 1062) Canvas site. Students registered in this course must use the Canvas site created for this class. The site is where you will find any information associated with the lecture portion of the course. It will contain a course calendar, syllabus, and resources to help you succeed in our course. You will take quizzes through Proctorio, accessed through the course Canvas site. You will find your quiz scores posted here as well, under the “Grades” link.

ALEKS site. There is a link from the lecture Canvas site to the ALEKS homework system. Follow the instructions there to setup your account correctly. You can find your homework scores under the “Gradebook” link in ALEKS.

Lab (CHEM 1066) Canvas site. This is the site where you will find your lab syllabus and multiple resources associated with completion of the laboratory projects. You will view your laboratory grades here, under “Grades” link. Please note that the lab is a separate, graded course that must be taken at the same time as you take the lecture course.

Calculators

Acceptable calculators. *The presence or use of graphing and/or programmable calculators is FORBIDDEN on exams.* Their presence or use during an exam will be considered cheating. Only non-programmable calculators with limited memory will be allowed for use during exams. Any one-line display calculator is allowed. The TI-30Xa is the suggested calculator for this and all CHEM 1XXX courses. The bookstore stocks this calculator for around \$10. The TI-30X IIS is an acceptable two-line calculator. Many other two-line calculators are programmable and would therefore not be allowed. If you have any questions about your particular calculator, see the instructor immediately. Calculators may not be shared during quizzes or exams. If you are concerned about battery failure during the exam, bring a second calculator or extra batteries with you. In addition, the Proctorio system has a built-in calculator feature that you can use during quizzes.

ALEKS Homework

You will have regular, required assignments using ALEKS, and you should expect to spend several hours a week working in ALEKS. Just how much time you will spend will depend critically on how efficiently you use the ALEKS program. An introduction is posted on our course Canvas site to help you get the most from ALEKS with the least time and effort. You must follow the instructions in Canvas to ensure you’re registered for the correct homework site, and you must use your UMN E-mail address (@umn.edu) to earn credit.

Weekly homework assignments are due on scheduled dates by 11:59pm Central. Because assignments are available well in advance of the due date, no make-up opportunities are allowed. Full pie is due no later than Sunday, Dec 17 at 11:59pm Central.

Weekly Homework. You are expected to reach certain milestones in your mastery of the entire curriculum each week. The purpose of these weekly assignments is to keep you working regularly and consistently within the program so that you do not fall behind in our course content.

Full Pie. This portion of your grade will be determined just by your overall level of mastery on the last day of classes (how many topics ALEKS are in your pie at the end of the term), even if you master the skill well after its initial deadline earlier in the semester. This should also be motivation to restore topics to your mastery list that you may have lost at reassessment.

In-Class Activities

During class meetings, we will be employing a variety of in-class activities, including (but not limited to) demonstrations, in-class writing, problem-based learning, and quizzes. These activities are designed to help you engage in the class and

master the course material. By working on these problems during class meetings, you will be able to assess your own mastery of the material and where you need more study.

Can I record demos?

No. There is no recording in our class (of demos or anything else).

Quizzes and the Final Exam

Location. You can take your quizzes and final exam in any quiet, private, or semi-private location of your choosing as long as it has reliable, stable internet access for the duration of your quiz.

Times. The quiz window will be open each week from Thursday at 4pm Central until Friday at 4pm Central (24hrs). There is no time limit on quizzes, but you must complete the entire quiz in one continuous session. I strongly encourage you to begin your quiz no later than noon on quiz days to help ensure you have time to complete the quiz and help account for any technical difficulties you may encounter. I won't be available to help with quiz questions or technical issues after noon on Fridays, so please plan accordingly. You will not be able to access any quizzes after 4pm Central on Fridays.

In addition, the Proctorio information tab in Canvas gives the steps you should follow if you run into an issue on quizzes. It is expected that, if you encounter any issues related to quizzes in any way, you will first follow *all* of the steps posted there, including e-mailing Proctorio support. Please do not email me with quiz/access/technical issues unless you have already emailed Proctorio support during the 24-hour open quiz window, troubleshooted with them, and they have written to you that they have exhausted all possibilities.

All quizzes and the final exam will be proctored electronically in Canvas using Proctorio. The final exam window will be open from 12am midnight Central to 11:59pm Central on Monday, December 18th. Adjust your schedule NOW and plan any travel, weddings, employment opportunities, meeting etc. around these quiz dates and times. If you have conflicts with any of these exam dates and time, you should resolve them immediately or drop the course so that you don't earn zero points on a graded activity.

All quizzes, including the final exam, will be given ONLY at the scheduled dates and times. No make-up quizzes or alternative quiz dates are an option under any circumstances. If you are enrolled with a time conflict, you must submit a course conflict form. The final exam must be completed in order to earn a letter grade other than F in the course.

Quiz & Exam Behavior/Protocols. Please note that your full face must be on screen/camera at all times for the duration of your exam. If your face is not viewable, your score will not be accepted.

Items NOT allowed during an exam:

- *any device (cell phone or iPad/tablet) other than the laptop on which you are testing
- *hats of any kind
- *ear phones/ear buds
- *anything that obscures your face from the camera
- *scratch paper
- *graphing calculators or any calculator with more than two lines of display

You must follow all exam protocols called out here and in the instructions at the beginning of your exam to ensure credit for your work.

Format. You must have your student I.D., whiteboard, calculator, and mirror at each of the midterm quizzes and final. I.D. checks will be made by the e-proctoring system. All midterm exams for this course will consist of 12 questions, including multiple-choice, short answer, ranking, and matching. The exams will be proctored and graded by computer. You are to use all formulas and constants provided within the exam to ensure credit. *Make sure you understand fully*

how to set up your computer and prepare for e-proctoring in advance of the actual exams. **Details are provided in the class website.**

Dropped Quizzes. The lowest of the six quizzes will be dropped, so only five of the quizzes count towards your final grade. If you were granted an excused absence then the unweighted average score of all the student's other quizzes will replace the zero from the excused quiz.

Missed quizzes. In the case of a true emergency, serious illness, or University-related trip that prevents a student from taking a midterm exam, **an excused absence may be granted** in strict accordance with University policy (see link below). To obtain an excused absence, students must contact the instructor in advance OR as soon as circumstances allow to discuss the nature of the emergency. Documentation will be required. The unweighted average score of all the student's other exams will replace the zero from the excused midterm exam. Only one missed midterm exam will be replaced in this fashion. If circumstances prevent a student from taking more than one midterm exam, a meeting must be scheduled immediately with the instructor to discuss any options available. For information on missing the final exam, see "Incompletes".

<http://www.policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html>

Grading

I want to encourage you to work hard in our class and give you many opportunities to demonstrate and apply what you are learning. You will demonstrate your mastery of our course material through working in ALEKS (online homework) throughout the semester and by completing quizzes that assess your mastery of skills in our class. The percentage breakdown for each component is

Topic	Percentage
Homework	23% (13% weekly and 10% full pie)
Quizzes (5)	55%
Final Exam	22%

The table below outlines the requirements for each letter grade in our class.

Letter Grade	Overall %
A	85 or higher
A-	80-84.99
B+	75-79.99
B	70-74.99
B-	65-69.99
C+	60-64.99
C	55-59.99
C-	50-54.99
D	40-49.99
F	Below 40

Other Grade Issues

Late Registration. Please be advised that joining the course after the start of classes does not excuse you from attendance or any work collected and/or graded. You should give careful consideration to this prior to late addition of our course.

Regrades. Request an exam regrade (in writing directly to the instructor via e-mail) by the end of the week following the exam.

S/N Grading. If you are registered for this course on an S/N basis, a grade equivalent to C- on the A-F scale will be required to receive an "S". A D+ or below will receive an "N". Many programs or transfer courses do not like or will not accept S/N grades or will assume that they are the minimum possible grade. Requests to change grading basis after the University deadline will not be approved.

Incompletes. Students who have an EXCUSED ABSENCE from the Final Exam, and have taken all midterm exams, may be eligible to receive a grade of "I" in the course. Incompletes will not be granted if a student has missed earlier exams, or is not passing based on the work up to the final. You need to fill out an incomplete request form (available in Smith 115) and have it signed. See me for details. This grade is NOT routinely assigned! Any incomplete must be made up in the following semester. After that time all incompletes will turn into F grades.

Withdrawals. If you are considering withdrawing from the class for academic reasons, I urge you to come and speak with me. Your situation may not be as bad as you think it is. If you do decide to drop the class, you should officially withdraw from the course following the rules for your college and know that students withdrawing from the course will not have any records retained for use upon re-taking the class.

Please note that if you drop lecture (1062) you must also drop lab (1066) unless you do so on or after TBA.

Additional Help

Instructor. Asking questions during office hours is a first line of defense toward overcoming conceptual problems with the course material. Get help early on so that problems do not compound! I hope to see you in office hours so that I can help you if you are having any difficulty.

ALLY Statement. I strive to serve as an effective Ally for students who hold marginalized identities. I am available to listen and support you in a safe and confidential manner. I can help connect you with resources to help address barriers that may interfere with your academic and social success on campus as related to diversity, access, or safety. My goal is to help all students to be successful and to maintain a safe, accessible, and equitable campus.

Free Tutoring. There are Zoom links for Chem 1062 drop-in tutorial sessions conducted by general chemistry TAs. See the TA web link for additional details. <https://sites.google.com/umn.edu/general-chemistry/tutoring-resources>

Issues with your Instructor. On occasion you may have a concern or problem regarding this course. You will find your instructor quite willing to discuss this with you. If, however, you wish to discuss it with someone other than your instructor, please contact Dr. R Lee Penn, the Chemistry Department Director of Undergraduate Studies. Their office is 225 Smith Hall and phone number is 626-4680. You may also send e-mail to them at rleepenn@umn.edu. They will serve as a mediator in helping to resolve the issue.

University of Minnesota Policy Statements

Overlapping & Back-to-Back Courses

Enrolling in overlapping or back-to-back courses that does not allow enough travel time to arrive at our class meetings on time is prohibited. For more information, please see:

<http://policy.umn.edu/Policies/Education/Education/OVERLAPPINGCLASSES.html>

COVID-19, Face-Coverings, Symptoms, and Vaccination

The University of Minnesota currently requires all students, staff, and faculty to wear masks when indoors, regardless of vaccination status, and strongly encourages members of the campus community to get vaccinated. Resources are available for accessing vaccines.

Please stay at home if you are experiencing symptoms of COVID-19 and consult with your healthcare provider about an appropriate course of action. Please contact me right away so we can keep you on track in our course and keep all of your peers safe from

exposure. All of our course materials are accessible through our Canvas site, so there is no reason to attend class if you may have COVID-19.

Student Conduct Code

As a student at the University you are expected adhere to Board of Regents Policy: *Student Conduct Code*. To review the Student Conduct Code, please see: http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf.

Scholastic Dishonesty

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code: http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf) If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University.

Beware of websites (such as Chegg and Study Hero) that advertise themselves a "tutoring sites". It is not permissible to upload any instructor materials (such as videos, worksheets, hw assignments, exam questions) to these sites without their written permission. In addition, using these sites to complete homework or answer exam questions is consider academic dishonesty and will result in an F for the course.

The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: <http://www1.umn.edu/oscai/integrity/student/index.html>. If you have additional questions, please clarify with your instructor for the course. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.

Student Mental Health and Stress Management

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. University of Minnesota services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via <http://www.mentalhealth.umn.edu/>.

Teaching & Learning

The materials provided in this course are intended only for the students officially enrolled in this section and are to be used to learn and practice the course material. Disseminating class notes, videos, exams, etc... beyond the classroom community or accepting compensation (in the form of cash or in trade, such as access to a study website) undermines instructor interests in their intellectual property while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community and are not allowed. For additional information, please see: <http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>

Sexual Harrassment

<http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf>

Equity, Diversity, and Equal Opportunity

We welcome to this course individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability, and other visible and invisible differences. Instructors, teaching assistants, and students are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. This is in agreement with university policy: http://regents.umn.edu/sites/regents.umn.edu/files/policies/Equity_Diversity_EO_AA.pdf

For information on the Diversity and Inclusion Committee in the Chemistry Department, see: <https://sites.google.com/umn.edu/chemintranet/diversity-inclusion>

Collaboration among people of all cultures and backgrounds enhances our experiences and contributes to excellence in teaching, learning, and research. We strive for a climate that celebrates our differences and strengthens our department by embracing and working to increase diversity, equity, and inclusion.

For the Gender and Sexuality Center for Queer and Trans Life, see:

<https://gsc.umn.edu/>

For gender-neutral restrooms in Smith and Kolthoff Halls and elsewhere on campus, see:

<https://sites.google.com/umn.edu/chemintranet/accessible-gender-neutral-restrooms>

Disability Resource Center

The University of Minnesota views disability as an important aspect of diversity, and is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability in any area such as mental health, attention, learning, chronic health, sensory, or physical, please contact the DRC (612.626.1333, <https://disability.umn.edu>) to arrange a confidential discussion regarding equitable access and reasonable accommodations. Students with short-term disabilities, such as a broken arm, can often work with instructors to minimize classroom barriers. In situations where additional assistance is needed, students should contact the DRC.

If you are registered with the DRC and have a disability accommodation letter dated for this semester or year, please contact me as early in the semester as possible to review how the accommodations will be applied in the course.

Class Schedule

Week	Day	Date	Topic	Homework Due	Quizzes
1	M	4-Sep	Labor Day: No Class		
	W	6-Sep	Chapter 16		
	F	8-Sep	Chapter 16		
2	M	11-Sep	Chapter 16		
	W	13-Sep	Chapter 16	A (Due at 11:59pm)	
	F	15-Sep	Chapter 16		
3	M	18-Sep	Chapter 16		
	W	20-Sep	Chapter 17	B (Due at 11:59pm)	
	F	22-Sep	Chapter 17		Quiz 1 (opens 4pm Th 9/21 & closes 4pm F 9/22)
4	M	25-Sep	Chapter 17		
	W	27-Sep	Chapter 17	C (Due at 11:59pm)	

	F	29-Sep	Chapter 17		
5	M	2-Oct	Chapter 17		
	W	4-Oct	Chapter 18	D (Due at 11:59pm)	
	F	6-Oct	Chapter 18		Quiz 2 (opens 4pm Th 10/5 & closes 4pm F 10/6)
6	M	9-Oct	Chapter 18		
	W	11-Oct	Chapter 18	E (Due at 11:59pm)	
	F	13-Oct	Chapter 18		
7	M	16-Oct	Chapter 18		
	W	18-Oct	Chapter 19	F (Due at 11:59pm)	
	F	20-Oct	Chapter 19		Quiz 3 (opens 4pm Th 10/17 & closes 4pm F 10/18)
8	M	23-Oct	Chapter 19		
	W	25-Oct	Chapter 19	G (Due at 11:59pm)	
	F	27-Oct	Chapter 19		
9	M	30-Oct	Chapter 19		
	W	1-Nov	Chapter 20	H (Due at 11:59pm)	
	F	3-Nov	Chapter 20		Quiz 4 (opens 4pm Th 11/2 & closes 4pm F 11/3)
10	M	6-Nov	Chapter 20		
	W	8-Nov	Chapter 20	I (Due at 11:59pm)	
	F	10-Nov	Chapter 20		
11	M	13-Nov	Chapter 20		
	W	15-Nov	Chapter 21	J (Due at 11:59pm)	
	F	17-Nov	Chapter 21		Quiz 5 (opens 4pm Th 11/16 & closes 4pm F 11/17)
12	M	20-Nov	Chapter 21		
	W	22-Nov	Chapter 21	K (Due at 11:59pm)	
	F	24-Nov	No Class: Thanksgiving		
13	M	27-Nov	Chapter 21		

	W	29-Nov	Chapter 21	L (Due at 11:59pm)	
	F	1-Dec	Chapter 23		Quiz 6 (opens 4pm Th 11/30 & closes 4pm F 11/1)
14	M	4-Dec	Chapter 23		
	W	6-Dec	Chapter 23	M (Due at 11:59pm)	
	F	8-Dec	Chapter 23		
15	M	11-Dec	Chapter 23		
	W	13-Dec	Review		
	F	15-Dec			
16	M	18-Dec		Sat 12/17 Full Pie Due	Final exam opens at midnight closes at 11:59pm
	W	20-Dec			
	F	22-Dec			