



Problem Solving in Chemistry

BRIDGE Program

Summer 2024



Instructor

Prof. Veronica Berns, *Assoc. Professor of Instruction*

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Meeting times

Monday August 8 – Friday September 2

TuWThF, 2:30 pm – 4:00 pm

All meetings are on campus. Stay tuned to Canvas announcements for locations.

Course Philosophy

Who should take Chemistry BRIDGE?

You should consider taking the Chemistry elective if you want to explore the skills needed to succeed in laboratory-based physical science courses. Students in Chemistry BRIDGE will work on strategies for planning experiments, analyzing data, and taking exams.

When choosing your elective, you should consider taking a class that will challenge you to improve skills you feel need more attention. Challenge and discomfort are inherently part of learning something new.

Description of Chemistry BRIDGE

BRIDGE is a great opportunity for us to learn some science this summer before Fall Quarter begins! Chemistry tends to be one of those classes that students find challenging, and it isn't usually because of the subject itself, it's because of the elevated expectations of students that often go unspoken. Unlike many high school-level courses, a university-level chemistry course goes beyond memorizing. We test students' understanding of concepts by their ability to solve multi-step chemistry problems. An example of this is applying two or three chemistry concepts simultaneously to solve a single problem.

Fortunately for us, **that's what BRIDGE is all about: Stepping outside of high school expectations and clarifying what a "university level" course is asking you to do.** We are going to focus not just on what it means to take courses at NU, but we are also going to build a toolbox together. You'll walk away from this class with the skills to be successful in whatever you do—whether you end up being a chemistry major or never taking another chemistry class again!

Statement of Inclusivity

This course strives to be an inclusive learning community, respecting those of differing backgrounds and beliefs. As a community, we aim to be respectful to all students in this class, regardless of race, ethnicity, socioeconomic status, religion, gender identity or sexual orientation.



Expressions of Personal Identity

This course affirms all gender expressions and gender identities. On or before the first day of class you will have the opportunity to reply to a survey and let us know what name we should call you and the pronouns you use. Please tell us what you want to be called, even if it doesn't match what is on the official roster. Professor Berns and your TA welcome you to correct us on your name or gender pronouns. If you have concerns, please contact Professor Berns in a meeting or by email, whatever is most comfortable for you.

Your Responsibilities

Required Texts

- **General Chemistry: Principles and Modern Applications. 11th edition, Petrucci, Herring, Madura, and Bissonette. Pearson Prentice Hall, 2011.**
If you will be taking Chem 110 or Chem 151 this will be your textbook. If you will take Chem 171, you will use a different textbook for that class.
- **Calculations in Chemistry. 2nd edition, Dahm and Nelson. Norton, 2016.**
This will be a valuable resource for you as you work through chemistry topics during the BRIDGE course and during chemistry courses during the school year. It provides detailed descriptions of the stepwise methods for solving many types of problems with worked examples.

These texts are provided FOR FREE through the Bridge program. Don't buy them!
You can generally keep your textbook in your dorm room. Should we need any other course materials they will be available on Canvas.

Absences

Because of the short time span of the course, absences are not expected. However if you should find yourself ill or in an emergency, please communicate with Professor Berns. Prof. Berns will determine the best course of action. **Please avoid spreading illness to others: Stay home when you're really sick and send me an email—we will work out something!**



An absence that is unexcused or unannounced is considered unacceptable. Unexcused absences will impact your grade in the course.

Plagiarism and Academic Integrity

Plagiarism, the unacknowledged appropriation of another person's words or ideas, is a serious academic offense. For every course at Northwestern, it is imperative that you hand in work that is your own, and that cites sources whenever you draw from the work of others. Please see refer to [Northwestern University's Office of the Provost's Policy on Academic Integrity](#) and the [WCAS Student Handbook](#) for more information.



Our definitions of plagiarism may differ from your previous experiences. Prof. Berns and the TAs can help clarify what plagiarism is at Northwestern. Please review the links above and ask us any questions you may have.

Logistics: How does this class work?

The most important part of the course is not the chemistry content; rather we will focus on how we approach learning something new. We will cover some chemical theory, do lab experiments, discuss approaches to calculations for specific types of problems, and practice solving related problems. Some work will be done as a class, some in small groups of students, and some as individuals. You'll have the opportunity to demonstrate your understanding in the form of in-class quizzes, homework, and a final exam. You will not have to write any lab reports, but we will practice the skills needed for scientific writing together, during class.

Grades

This class is assessed as a letter grade. If you attend class and put effort in, you will pass. The letter you earn (A, B, C, etc.) will be determined by your grades on course work. You can earn a letter you'll be proud of through effort and growth in the skills we're working on, and that letter ends up on your transcript and factors into your college GPA.

You should use the letter grade on your transcript as feedback on your approach to the class. How did your strategy work for you? Will those methods help you reach your goals during the school year?

The letter grade on your transcript will be determined by:

Assessment category	How many points each	How many points in this category?
Daily participation (x 15)	2	30
Homework (x 6)	10	60
In-class quizzes (x 3)	20	60
Final exam (x 1)	100	100
Final transcript grade is out of →		250

It is also worth mentioning that this is a BRIDGE class. This class is supposed to help you see what college looks like. Therefore, we will also discuss your letter grade for the course based on the standards of the general chemistry classes you might be enrolling in for Fall Quarter. This “Hidden Letter” does not show up anywhere official and no one else will see it but YOU (and Prof. Berns). I will call it a “Hidden Letter grade” to differentiate it from the one on your transcript and to emphasize that you and me are the only two people who will see it. You will have an opportunity to ask questions and discuss with Professor Berns when the class ends.

Technology in the Classroom

Computers or tablets are welcome but smartphones are not allowed in our classroom.



Some research suggests that writing notes on paper helps you learn and study better. If you need or just prefer to take notes on a computer, that is acceptable but I encourage you to try using paper if you are open to it.

While on an electronic device in class, *even if you think you can multitask successfully*, please be considerate of Prof. Berns and other students in the room: **Avoid using your device to do stuff that isn't related to our class.**

Calendar

Class day		Do this to prepare before this class	What is going on in class	Do this to review after this class
Tu	Aug 6	Nothing!	Welcome! Lecture on solutions and lab safety	Take the safety quiz on Canvas
W	Aug 7	Reading/HW 1 due	Plan your experiment	Review your experimental plan with your lab partner
Th	Aug 8	Reading/HW 2 due	Experiment 1	
F	Aug 9	Bring your laptop	Process data from Expt 1	Do the related problems on your own
Tu	Aug 13	Study for quiz	QUIZ on Expt 1 Post-lab writing exercise	Do the related writing exercise on your own
W	Aug 14	Reading/HW 3 due	Lecture on coordination complexes	Review the textbook and cross check details with your notes
Th	Aug 15	Reading/HW 4 due	Plan your experiment	Review your experimental plan with your lab partner
F	Aug 16		Experiment 2	
Tu	Aug 20	Bring your laptop	Process data from Expt 2	Try the related problems on your own
W	Aug 21	Study for quiz	QUIZ on Expt 2 Post-lab writing exercise	Try the related writing exercise on your own
Th	Aug 22	Reading/HW 5 due	Plan your experiment	Review your experimental plan with your lab partner
F	Aug 23	Reading/HW 6 due	Experiment 3	Process the data on your own!
Tu	Aug 27	Process data from Expt 3 and study for quiz	QUIZ on Expt 3 Post-lab writing exercise	Try the related writing exercise on your own
W	Aug 28	Complete the practice exam in an "exam setting"	Recitation: Review practice exam	Practice problems you struggled with on the practice exam
Th	Aug 29	Study for exam	FINAL EXAM (80 min)	Take a break!
F	Aug 30		Review the final exam together	