

Chemistry 102

INSTRUCTOR: SARAH WOLF | SAWOLF@SAS.UPENN.EDU

📅 Summer 2022 · MTWRF 8:30-10:15 | 📍 Room | 🏠 Canvas

Course Overview

Course Description Chemistry governs all phenomenon around us, whether we care to see it or not. The goal of this course is to open our eyes, and explore the fundamentals of Chemistry, dissecting how the laws of energy and spontaneity, and intricacies of chemical reactions, affect the world on a much grander scale. To accomplish this, we will explore thermodynamics including electrochemistry, equilibrium systems including acids and bases, and kinetics of reactions.

Course Goals By the end of this course, students will be able to solve problems (with proper uncertainty and units expressed), understand phenomenon and concepts, and describe concepts learned to others, as outlined more specifically for each unit.

Resources

Office Hours Office hours refers to time I have set aside for the sole purpose of being a support to you, the students. Please do not hesitate to take advantage of them! Office hours will be in the classroom on Tuesdays and Thursdays from 10:15-12:00 (in lieu of recitation)

Student Disability Services Students who require accommodation on the basis of physical, psychiatric, or learning condition are welcome and encouraged to contact student disability services via vpul.upenn.edu/lrc/sds/ in order to discuss your needs and appropriate services available to you. Please also feel free to discuss accommodations more informally with me, I'm always happy to help.

Mental Health Services Counseling and Psychiatric Services (CAPS) is free and available to all students. Whether or not you are struggling with mental illness, your mental health is important, and I urge you all to look into what CAPS can do for you (caps.wellness.upenn.edu) and consider taking advantage. CAPS can be reached 24/7 by 215-898-7021.

Some more notes You are all here as chemists (even if only for the semester), but you are people first. I am here to help you learn and succeed in this course, but also to be a support in any way you need. I understand you have a life beyond this class, and even beyond your studies in general, so if you ever need extra time for an assignment don't be afraid to ask. You will never owe me information about your personal life, though you're always welcome to talk to me. I'm happy to listen, or direct you to someone more able to help. With regard to this or course material, my email is always open.

Diversity Statement

You are welcome here No matter your race, gender, sexuality, immigration status, disability, family background, income...you are welcome here. If anything I or someone else does makes you feel something different, please do not hesitate to reach out so we can work to remedy the situation. I understand that these words alone mean little, but I hope my actions further communicate my commitment to being welcoming to all students, and I hope you all as students embody a spirit of welcoming and support of one another. Discrimination and lack of empathy will not be tolerated.

Course Requirements

Required Texts Zumdahl, Chemical Principles, 8th edition. Earlier editions contain essentially the same material, and but proper edition is highly suggested as I will suggest practice problems from this edition.

Other Requirements A calculator is necessary to succeed in this class. A multiline graphing calculator is preferred. If this or the textbook presents a financial hardship please reach out to discuss.

Succeeding in this Course

Use available resources Many are described in this document, and they exist to help you. Don't be afraid to ask for help!

Practice, practice, practice Assigned problem sets exist to help you practice, check understanding, and deepen critical thinking about concepts. When practicing, make sure you understand what you are doing, and why. Try to connect concepts with math, and problem solutions with the world around you.

Come to class, and prepare first Reading the book, practicing problems, knowing what you understand and where you have questions, will all help you make the most out of class time.

Study together I want this class to be a collaboration, not a competition. You're in this together, and have much to learn from each other. Tackling the material together makes it less overwhelming, and opens you to new perspectives and ideas. You might even make lifelong friends!

Course Structure

Review The first 20 minutes of class will involve rotating students reviewing the important points from the previous class. Because this is a summer class, it moves *fast* and this review time will be important to staying on track.

Lecture The bulk of regular class time will focus on active lecture. This means I'll introduce new material, but expect you to actively participate in the learning and drawing on old skills.

Recitation On Mondays, Wednesdays, and Fridays, class will be followed by recitation. The focus of recitation will be practice problems, in small groups.

HW Sets roblem sets will be given regularly, due at the start of each exam. These can be worked on in groups, but please turn in your own work.

Course Policies

Attendance Attendance is required for success in this course. That said, occasional absences are allowed, and do not require excuses, because life happens. You are asked to obtain missed material on your own (recitation problems will be posted). If you will be absent for an extensive amount of time, please contact me to discuss.

Expectations During class, your focus should be on learning Chemistry, and not on anything that may be disruptive to the rest of the class. Please remain engaged and focused during class, and show respect and kindness to your fellow students.

Questions I am always happy to answer any relevant questions– during class or outside of class hours by either stopping by office hours or sending me an email. I will answer emails promptly during “business hours” and answer emails sent on nights or weekends within 24 hours.

Exams Exams will be scheduled during class time on recitation days, with recitation time then acting as the day’s lecture, and you are expected to bring only a writing utensil and calculator. A periodic table and relevant constants/ equations will be provided. Academic honest is important, and any failure to follow the academic code of conduct will be taken very seriously.

Grading

Exams (4 throughout semester, with lowest dropped) 75%

Problem Sets 20%

Review of previous days material 5%

Tentative Schedule

Date	Topics	Readings
30-June	Energy, Enthalpy	9.1-9.3
1-July	Calorimetry, Hess's Law	9.4-9.6
4-July	NO CLASS (independence day)	
5-July	Entropy	10.1-10.4
6-July	Gibbs Free Energy	10.5-10.7
7-July	Gibbs and Equilibrium	10.8-10.11
8-July	Exam 1/ Equilibrium Constant	6.1-6.5
11-July	ICE Tables	6.6-6.7
12-July	ICE Tables	
13-July	Le Chatlier's	6.8
14-July	Weak Acid/ Base	7.1-7.6
15-July	Exam 2/ Polyprotic acids	7.7
18-July	Salts/ Mixtures	7.8
19-July	Water contribution	7.9-7.10
20-July	Buffers	8.2, 8.4
21-July	Titrations	8.5
22-July	Polyprotic Titrations	8.7
25-July	Solubility	8.8-8.9
26-July	Rate Laws	15.1-15.5
27-July	Rate Laws	
28-July	Rate Determining Steps	15.6
29-July	Exam 3/ Steady State Approximation	15.7
1-August	Arrhenius Equation	15.8-15.9
2-August	Electrochemistry	11.1-11.6
3-August	Electrochemistry	11.7-11.8
4-August	Exam 4	
5-August	Celebration	OPTIONAL