

CHEMISTRY 110 A AUTUMN 2021 (SLN: 12334)

SYLLABUS

Course Web Site: <https://canvas.uw.edu/>

Registration Questions and Entry Codes: Chemistry Undergraduate Services | chemugs@uw.edu

Lectures/Lessons: M, W, F 8:30 – 9:30AM in BAG 131

TEACHING TEAM

Course Instructor: Prof. Andrea Carroll | BAG 201A | ageddes@uw.edu or direct message via Canvas Inbox

Public Office hours: TBD

Private Office Hours: If you would like to discuss something personal/private, please email me to schedule a private appointment. I will send you a private Zoom link.

Discussion/Lab Section TAs:

Name	Email	Sections
Ashley Dostie	amdostie@uw.edu	AA, AB
Bobby Wan	jiahaow@uw.edu	AC, AJ
Kyle Yu	kyleyu5@uw.edu	AD, AE
Siwei Yu	siweiy98@uw.edu	AF, AG, AH, AI

TA Help Sessions: Details TBD. You may attend any and all TA help sessions! The TAs can help you course content, ALEKS, etc.

REQUIRED MATERIALS AND CONNECTIVITY

Except where indicated, all items are required and available from the University Bookstore:

- **Introductory Chemistry: A Foundation, 8th ed., Zumdahl and Decoste**
- **Study Guide to Introductory Chemistry, Zumdahl** (optional).
- **Scientific calculator.** A simple calculator that can handle log calculations and scientific notation is sufficient.
- **ALEKS access.** Purchase online: www.aleks.com (see ALEKS info on the course website for more information).
- **Daily online access** to Canvas (canvas.uw.edu)

LEARNING OBJECTIVES

Students who successfully complete CHEM 110 will be able to

At the end of this course, you will be able to:

- **describe** matter qualitatively at the microscopic and macroscopic levels.
- **predict** microscopic quantities given macroscopic data, and vice versa.
- **predict** the types and amounts of products of common chemical reactions.
- **analyze** a complex problem using chemical principles, **discriminate** between useful and un-useful information within the context of the problem, **design** a solution path, and **present** the result with appropriate descriptors.
- **evaluate** whether the result of a calculation makes sense, **analyze** sources of error in the approach (i.e., arithmetic, logical, or conceptual) and **redesign** the solution path to achieve an accurate result.

The course is organized into five areas of focus, and each is designed around a set of questions that a person might ask if they were curious about how chemistry works.

Relationships. Goal: to develop relationships with each other and with the material.

- Who is everyone, and why are these relationships important to your learning?
- How do scientists think?

Communication. Goal: To learn how to properly communicate scientific findings.

- Why does it matter how we communicate science?
- How do we know how good a measurement is, or what it is measuring?
- How do we appropriately and efficiently communicate a scientific finding?

Representation. Goal: To represent matter at microscopic and macroscopic scales of measure.

- Why does it matter how we represent matter?
- How do we know if a chemical change occurred?
- How do we know that atoms exist?
- What do molecules look like, and how do we name them?

Connecting. Goal: To move quantitatively between microscopic and macroscopic scales of measure.

- Why do we want to connect the macro- and microscopic scales of measure?
- How do we count atoms if they are too small to see?
- How can we use macroscopic experimental data to determine microscopic chemical composition?

Change. Goal: To describe chemical change qualitatively and quantitatively.

- Why do we care about describing chemical change?
- What are some common types of chemical reactions?
- How much stuff can we get from a chemical reaction?
- Why does a system get hot or cold during a reaction?

COURSE COMPONENTS AND GRADING

The course consists of:

- 3 lecture lessons per week – these will be automatically recorded using Panopto lecture capture.
- 1 discussion section per week – with TA. These will NOT be recorded.
- Daily work in the ALEKS online learning environment, with weekly deadlines and an end-of-the-quarter progress deadline
- Online quizzes and exams

GRADING

The point distribution for the evaluative components of the course is as follows:

Quizzes	54%
Final exam	16%
Participation	10%
ALEKS Objectives & Mastery	20%
TOTAL	100%

Quizzes. Quizzes will be in-person during the regularly-scheduled class session on Fridays in weeks 3, 5, and 7 and on Wednesdays in week 10. There will be four quizzes and at the end of the quarter one quiz score will be ignored/dropped before course grades are assigned. (The score dropped will be the lowest, whether that is from an absence or from a low earned score. Zero scores related to cases of academic misconduct in which a student is found responsible for violating the student conduct code will NOT be dropped.) Each quiz will focus mainly on the most recent set of lectures, but chemistry is a cumulative subject by nature, so we will assume that you have a firm understanding of material from earlier in the quarter and from *previous courses* when we the quiz questions. **The Quizzes represent 54% of your course grade (18% each).**

Final Exam. The Final Exam will be in person during the University-assigned final exam session for this course on Tues 12/14. The Final Exam is cumulative. Towards the end of the quarter we will provide details about the percentage by points of each course unit on the final. **The Final Exam represents 16% of your course grade.**

Participation. Discussion section (called Quiz section in the UW Time Schedule) will be weekly on Tuesdays. To earn your participation credit, you must *arrive on time* and *participate* in good faith during the Discussion Section, not simply be in attendance. The two lowest Discussion Section scores will be dropped, allowing you to miss two without penalty. Additional participation-based activities will include the surveys, reflections, and active reading assignments that are part of the “Catalyze Your Success” learning strategies initiative. These additional opportunities will not be “extra-credit” points, so please be sure to complete them when they are available. **The Participation category represents 10% of your course grade.**

ALEKS. Your ALEKS grade is constructed from your Objective scores and the percent of the Pie you complete by the end of the quarter. The more of the pie you complete, the higher your ALEKS score will be, **but you do not have to complete the entire pie to earn credit for ALEKS.** Similarly, **you do not have to complete all the topics in an Objective to earn credit for that Objective.** Whatever percentage of topics you complete by the due date will be your score for that Objective. The Objective and Pie Mastery portions of your ALEKS grade are weighted equally. They each represent 10% of your overall course grade, so altogether the **ALEKS category represents 20% of your course grade.** ****Note: minimum ALEKS Pie mastery scores are tied to the course grades: 70% mastery is required to earn course grades of 1.7-2.4, 80% for grades 2.5-3.4, and 90% for grades 3.5-4.0.**

Monitor your Scores. Your scores for the various course components will be recorded using the online Gradebooks in Canvas (canvas.uw.edu). The scores from ALEKS will be migrated to the Chem 110 course gradebook periodically throughout the quarter.

Grades. Total course scores will be calculated as outlined above and grades will be assigned based on the percent score earned for the quarter. The table below provides the PROPOSED score to grade conversion. We reserve the right to adjust these conversions and any adjustments will be described in class and/or on the course website if they are needed. Note from the ALEKS section above: minimum ALEKS Pie mastery scores are tied to the course grades: 70% is required to earn course grades of 1.7-2.4, 80% for grades 2.5-3.4, and 90% for grades 3.5-4.0. You will see this requirement reflected in the table below. (Example: if you have a score of 82%, which is shown with a grade of 2.7, but only achieve 79% Mastery in ALEKS (% of Pie), then the

grade assigned will be a 2.4 (the maximum grade available for ALEKS mastery in the 70% bucket.) It is the Chemistry Department's policy not to make grade changes of 0.1 after final class grades are submitted to the UW Registrar.

Proposed Score-to-Grade Conversions

Numerical Grade	Minimum % score in course	Minimum ALEKS % Mastery of Assigned Topics	Numerical Grade	Minimum % score in course	Minimum ALEKS % Mastery of Assigned Topics
4.0	≥95	90	2.4	79	70
3.9	94		2.3	78	
3.8	93		2.2	77	
3.7	92		2.1	76	
3.6	91		2.0	75	
3.5	90		1.9	74	
3.4	89	80	1.8	73	
3.3	88		1.7	72	<70
3.2	87		1.6	71	
3.1	86		1.5	70	
3.0	85		1.4	69	
2.9	84		1.3	68	
2.8	83		1.2	67	
2.7	82		1.1	66	
2.6	81		1.0	63	
2.5	80		0.9	60	
			0.8	57	
			0.7	54	
			0.0	<54	

ACADEMIC ETHICS

Original work performed in good faith is assumed on all assignments and course components.

The Student Conduct Code prohibits several forms of academic misconduct (see [section 7: Prohibited Conduct](#)), including:

- Cheating
- Falsification
- Plagiarism
- Unauthorized collaboration
- Engaging in behavior specifically prohibited by an instructor
- Recording and/or dissemination of instructional content without express permission of the instructor

You are required to sign and submit an honor code statement for this course, in which you will affirm your acknowledgment of what constitutes academic misconduct in this course as defined below. Failure to adhere to this code of ethics will result in referral for possible disciplinary action as described in the Student Conduct Code.

General policies for all course assignments

Your submissions for ALL assignments (including but not limited to homework assignments, quizzes, and exams) should be your own individual work unless you are explicitly told otherwise by your instructor.

You are strictly prohibited from sharing any content from ANY assignment (including but not limited to homework assignments, quizzes, and exams) with any website or app (including but not limited to Discord, Chegg, Course Hero, and Snapchat) or any other course content repository (virtual OR physical) that is not explicitly approved by the instructor. This prohibition applies both during the quarter that you are taking this course and any time after the course ends.

Specific policies for exams and quizzes

During exams and/or quizzes, you may not seek out or accept any input from ANY other individual, whether or not they are a classmate. Further, you may not provide assistance to other students during an exam or quiz unless an instructor explicitly allows for that collaboration.

LECTURES

Lectures. Lessons covering course content will be provided in person in Bagley Hall. These sessions will be recorded and available for viewing in Panopto if you cannot be in class or want to review the lesson content.

Textbook material. Lectures will cover only highlights of the textbook material. The textbook sections that correspond to each lecture are listed in the course schedule. ***You are responsible for material covered in class AND in the textbook*** (whether or not it is explicitly covered in lecture).

DISCUSSION SECTION

Activities in Discussion Sections (“QZ” in the Time Schedule). The weekly Discussion Section will be facilitated by your TA. The primary activities during Discussion Section will include:

- TA fielding questions about quizzes, general course content, etc.
- working with your colleagues on worksheet problems relevant to current course topics.

The worksheet problems are intended to help you synthesize the material covered in the previous week’s lectures, therefore, some will be quite challenging. A blank version of the worksheet will be available in advance of a particular Discussion Section. You can find them in the relevant Unit page in the Course Topics module. The worksheet key will be available after the last Discussion Section wraps up each week.

ONLINE LEARNING (ALEKS)

This course uses the internet-based learning program **ALEKS** (Assessment and LEarning in Knowledge Spaces). In ALEKS, you will complete **learning objectives** rather than traditional homework assignments. An ALEKS **Objective** contains topics relevant to the lecture discussions. ALEKS will present you with a series of problems that explore a particular topic. The problems will have enough variability that you will only be able to get them consistently correct by understanding the core principle or skill defining the topic. Your daily/weekly work on ALEKS will be on your own schedule outside of class, although there are specific deadlines by which you must complete various Objectives. The registration code for your ALEKS course can be found on the ALEKS information page of the course website in Canvas. **Make sure that you register for the ALEKS course specific to this quarter’s section of Chem 110.**

Your first task in ALEKS will be to complete an **Initial Knowledge Check**. This is ALEKS’s way of assessing your current knowledge of math and chemistry, so that it can guide you appropriately. You will probably be asked a few questions that you don’t know how to answer. Don’t worry...the ALEKS system is only determining your knowledge baseline so that it can be tailored to address your specific needs. ALEKS will give you a new Knowledge Check after you complete each Objective, so that it can track your evolving knowledge state as you move through the material and continue to tailor its approach to your unique learning path.

You, alone, are responsible for monitoring the due date and time for all ALEKS Objectives. Note that it is not possible to open up an ALEKS Objective 3 or 4 hours before it's due and be able to complete it. ALEKS will not let you access the problems corresponding to the more advanced topics in an Objective until you have mastered the basics, so *you will need to spend time nearly every day on ALEKS to complete the Objectives*. The schedule of Objectives and their due dates is available on the Canvas course site.

QUIZZES AND EXAMS

Quizzes. There are four quizzes in this course, delivered in person during our class session *almost* every other week on Fridays in weeks 3, 5, and 7 and on Wednesday in week 10. The lowest score among the four quizzes will be dropped. The dates for the quizzes are provided in the course schedule on Canvas.

Each quiz will focus mainly on the most recent set of lessons, but chemistry knowledge is cumulative by nature, so the quiz questions will often depend on knowledge from earlier chapters and courses. Information about quiz length and coverage will be posted as each quiz date nears.

Final Exam. The final exam will be in person during the time slot assigned in Finals Week. The final exam will be cumulative over the quarter. Information about length and coverage will be posted as the final exam date nears.

POLICIES FOR QUIZZES, EXAMS, & DISCUSSION SECTIONS

Absences.

If you are unable to complete a required course activity due to a valid, unavoidable cause, please report it by filling out the [Absence Reporting Form](#) available on the Department of Chemistry website link posted on the Canvas course site.

Examples of unavoidable causes include: illness; death or serious illness in the immediate family; and – with prior notification – observance of regularly scheduled religious obligations, attendance at academic conferences or field trips, or participation in university-sponsored activities. Note: absences due to participation in university-sponsored activities require PRIOR approval.

If you are ill or dealing with a serious illness in your immediate family, no documentation is necessary or required; *the Department of Chemistry requests that you NOT submit any health-related documents*. If you experience any of the other types of absences, please be prepared to submit the documentation supporting your absence.

Exam/Quiz Absences. If you have an unanticipated absence from a **quiz or exam, please submit the Absence Form within 48 hours of the exam**. The information and related non-medical documentation you submit will be reviewed and the course instructor will be notified of the status of your absence. If your absence is excused, either the missed assignment will be dropped before course grades are assigned or your performance on the final will be used to replace the score of the missed quiz/exam. If your absence does not meet the above criteria, it will be considered unexcused and you will be given a zero for the quiz/exam.

If you are absent from the **final exam** and are eligible for an incomplete, you must make up the final exam no later than the end of the next regular academic quarter to remove the incomplete. There are no exceptions to this rule. If you are absent and not eligible for an incomplete according to UW regulations, a course grade of 0.0 will be given.

CLASSROOM CLIMATE

The goal of the Department of Chemistry, and of the University of Washington as a whole is help you develop critical thinking skills. Those skills and your training to succeed in professional environments are enhanced when you interact with people with diverse backgrounds, embodiments, and experiences. Therefore, I expect you to follow the UW Student Conduct Code in your interactions with your colleagues and me in this course by respecting the many social and cultural differences among us, which may include, but are not limited to: age, cultural background, disability, ethnicity, family status, gender identity and presentation, citizenship and immigration status, national origin, race, religious and political beliefs, sex, sexual orientation, socioeconomic status, and veteran status. I expect the same of your TAs, UW staff members, and myself. Please talk with me right away if you experience disrespect in this class, and I will work to address it in an educational manner. DCinfo@uw.edu is a resource for students with classroom climate concerns.

ACCESS AND ACCOMMODATIONS

Your experience in this class is important to us, and it is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law. Disability Resources for Students (DRS) offers resources and coordinates reasonable accommodations for students with disabilities. If you have not yet established services through DRS, but have a temporary or permanent disability that requires accommodations, you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or visit disability.uw.edu. If you have already established accommodations with DRS, the information for the Alternative Testing Contract will be submitted to DRS via their online system. Students with accommodations are solely responsible for scheduling the exams with DRS well in advance of the exam dates. Regarding lab reports and accommodations for “quick turnaround assignments”: because students will have >24 hours after their lab session to upload in-lab reports into Gradescope and a full week for take-home reports, there will not be DRS-related deadline extensions for Chem 162 reports.

RELIGIOUS ACCOMMODATIONS POLICY

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy (<https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/>). Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form (<https://registrar.washington.edu/students/religious-accommodations-request/>).

KEYS TO SUCCESS

1. **Participate in ALL available sessions**, pay close attention, and take notes.
2. **Learning chemistry is a sequential process.** You must understand today's material before you can understand tomorrow's. As with all courses at UW, your instructors and TAs will assume that you are studying at least two hours for each hour of lecture and one hour for every hour of lab. Find a place that allows for periods of uninterrupted study. Skim through chapter or sections to be covered in the next lecture.
3. Make daily, weekly, and quarterly learning plans and follow those plans.
4. **Working in shorter, more frequent sessions in ALEKS** will be more efficient than long, marathon sessions.
5. **Practice!** Work on suggested end-of-the-chapter problems as well as topics in ALEKS - focus on understanding the concepts and general processes, not just memorizing how to solve a specific problem.
6. **Talk chemistry with fellow Chem 110 students.** You will not only learn more, but you will probably also enjoy the course more. This is a much bigger challenge with remote learning, but also so much more important when there are not in-person sessions. Use the discussion board, conferences, chats, etc. to create study groups for talking about the course content.

COURSE SCHEDULE

This schedule is tentative and subject to change. Any changes will be announced on the course website.

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 (9/27)	--	--	Intro. to Course and ALEKS	ALEKS Initial Assessment (try to complete by Saturday 9pm)	Scientific Method, Measurement, Unit Systems 1.3-1.4, pp. 6-7; 2.2-2.4
Week 2 (10/4)	Measurement, Unit Systems, Significant Figures, Scientific Notation; 2.1-2.5	Disc. Sect. Wkst 1	Scientific Notation, Unit Analysis, Temperature, Density 2.1, 2.6-2.8	ALEKS Objective 1 Due (11:59pm)	Wrap-up Ch 2; looking ahead to first quiz
Week 3 (10/11)	Composition & States of Matter, Physical vs. Chemical Change; 3.1-3.5	Disc. Sect. Wkst 2	The Elements, Dalton's Atomic Theory; 4.1-4.4, 4.9	ALEKS Objective 2 Due (11:59pm)	Quiz 1: Ch 1, 2 & 3
Week 4 (10/18)	Intro. to Modern Atomic Theory 4.5-4.6	Disc. Sect. Wkst 3	Isotopes and Ions, The Periodic Table, Intro. to Electronic Structure 4.7-4.10	ALEKS Objective 3 Due (11:59pm)	Chemical Bonds, Lewis Structures 4.11, 12.1-3, 12.6
Week 5 (10/25)	Multiple Bonds and Resonance 12.7 to pg. 287 only	Disc. Sect. Wkst 4	VSEPR Model of Molecular Structure 12.8-12.10	ALEKS Objective 4 Due (11:59pm)	Quiz 2: Ch 4 & 12
Week 6 (11/1)	Chemical Nomenclature 5.1-5.5, 5.7	Disc. Sect. Wkst 5	Counting by Weighing, The Mole 8.1-8.4	ALEKS Objective 5 Due (11:59pm)	Molar Mass 8.5
Week 7 (11/8)	% Composition, Empirical & Molecular Formulas 8.6-8.9	Disc. Sect. Wkst 6	Wrap-up Ch 8; looking ahead to next quiz	HOLIDAY ALEKS Objective 6 Due (11:59pm)	Quiz 3: Ch 5 & 8
Week 8 (11/15)	Chemical Reactions, Balancing Chemical Reactions 6.1-6.3	Disc. Sect. Wkst 7	Chemical Equations and the Mole 9.1-9.3	ALEKS Objective 7 Due (11:59pm)	Stoichiometry & Mass 9.3
Week 9 (11/22)	Concept of Limiting Reactants, LR Calculations 9.4-9.5	Disc. Sect. Wkst 8	More Limiting Reactants, Percent Yield 9.4-9.6 ALEKS Objective 8 Due (11:59pm)	HOLIDAY	HOLIDAY
Week 10 (11/29)	Wrap-up Ch 9; looking ahead to next quiz	Disc. Sect. Wkst 9	Quiz 4: Ch 6 & 9	ALEKS Objective 9 Due (11:59pm)	Bonding Review, Precipitation Reactions 12.1, 7.1-7.3
Week 11 (12/6)	Types of Reactions: Acid-Base Reactions & Redox Reactions 5.6, 7.4-7.6	Disc. Sect. Wkst 10	More on Types of Reactions: Acid/Base & Redox Reactions; Synthesis, displacement, combustion reactions 7.4-7.7	ALEKS Objective 10 Due (11:59pm)	Wrap-up of material ahead of Final Exam
Finals Week (12/13)	All ALEKS Open-Pie work due by 11:59pm	Final Exam Dec 14th 8:30am-10:20am			

****TEXTBOOK SECTIONS:** read these ahead of attending the scheduled class session

****QUIZZES:** in person in BAG 131

****ALEKS** deadlines are 11:59pm Thursdays except Obj #8 in week 9 which is due on a Wed; last Knowledge Check of the quarter will be after Obj #9 in week 10 (you won't have to take another K.C. after Obj 10)