

# CHEMISTRY 162 A SUMMER 2020 (SLN: 10689)

## SYLLABUS

**Lectures/Lessons:** M, Tu, Th 8:30 – 9:30 am PDT, via Zoom (Meeting ID and passcode: **see website**)

**Course Website:** <https://canvas.uw.edu/>

**Registration Questions:** Chemistry Undergraduate Services | [chemugs@uw.edu](mailto:chemugs@uw.edu)

## TEACHING TEAM

**Course & Lab Instructor:** Prof. Andrea Carroll | [ageddes@uw.edu](mailto:ageddes@uw.edu) or direct message via Canvas Inbox

**Public Office hours:** TBD, via Zoom (Meeting ID and passcode: **see website**)

**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:

Sections	Name	Email	Quiz/Discussion	Lab
AA	Tyson Carr	<a href="mailto:tacarr@uw.edu">tacarr@uw.edu</a>	Wed	Tues
AB	Tyson Carr	<a href="mailto:tacarr@uw.edu">tacarr@uw.edu</a>	Wed	Tues
AC	Chris Woodburn	<a href="mailto:cwoody@uw.edu">cwoody@uw.edu</a>	Wed	Wed
AD	Anna Merkulova	<a href="mailto:amerk@uw.edu">amerk@uw.edu</a>	Wed	Wed
AE	Chris Woodburn	<a href="mailto:cwoody@uw.edu">cwoody@uw.edu</a>	Wed	Tues
AF	Ashley Dostie	<a href="mailto:amdostie@uw.edu">amdostie@uw.edu</a>	Wed	Tues

**TA Help Sessions on Zoom:** You may attend any and all TA help sessions! The TAs can help you course content, ALEKS, pre-labs, data analysis, lab write-ups, etc. TA Help Sessions will NOT be recorded or posted in order to protect student privacy.

## REQUIRED MATERIALS AND CONNECTIVITY

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

- **Chemical Principles**, 6th ed., Atkins/Jones/Laverman (custom-split Chem 162 version contains Chapters 4, 6, 7, 10, 16, 17, 18, 19, and 20 as well as the introductory Fundamentals Section and the student solutions manual for these chapters).
- **UW General Chemistry 162 Laboratory Manual, Autumn 2020-Summer 2021** (Hayden McNeil; e-book via link available through UW Bookstore or on the Labs Canvas site); Note that you do NOT need goggles and lab coats this quarter - Labs will be attendance-required synchronous Zoom sessions with your TA at the times published in the UW Time Schedule.
- **Scientific calculator.**
- **ALEKS access.** Purchase online: [www.aleks.com](http://www.aleks.com) (see ALEKS info on the course website for more information). If your financial aid is delayed, contact your instructor for a temporary access code.

### Internet and Instructional Technology:

- **Access to a computer or tablet.** [Student Technology Loan Program](#) funded through Student Technology Fees
- **Daily online access** to Canvas ([canvas.uw.edu](https://canvas.uw.edu/)), Zoom ([washington.zoom.us](https://washington.zoom.us)), and ALEKS. **Weekly online**

access to Gradescope ([www.gradescope.com](http://www.gradescope.com)). All necessary links are available on the course Canvas site.

- **Internet access.** Students in WA State without broadband internet service: visit [WA State Drive-in wifi hotspots](#). Students outside of WA State: search for local options for free wi-fi access provided in response to the impacts of the COVID-19 pandemic.
- **For Zoom Discussion and Lab Sessions you must be able to participate by voice.** If your computer/tablet does not have a working microphone, you may need to log in with your phone as well as your computer/tablet.
- **Ability to convert a sheet of paper and/or file into a pdf.** *You do NOT need a printer or separate scanner for this course, but submissions cannot be a group of individual image files.* Free scanning apps are available for smartphones (such as Genius Scan and Scannable) – the Gradescope instructions page of the Labs site has more details for using these apps.
- **[UW Academic Support Programs Technology Access webpage](#).** Information and resources for technology access during remote learning.

## LEARNING OBJECTIVES

**Students who successfully complete CHEM 162 will be able to**

- Explain the properties of chemical molecules using bonding models, including hybridization and molecular orbital theory, with the understanding of their limitations.
- At a beginning level, analyze spectroscopic results to determine the structure of molecules.
- Use isomerism (structural, geometric, and stereo) to explain variation in chemical and physical properties.
- Explain macroscopic properties based on intermolecular forces within the chemical system.
- Describe the structure and properties of the liquid and solid states, as well as phase changes, at the particulate and macroscopic levels.
- Explain the chemical, physical, and thermodynamic properties of solutions at the particulate and macroscopic level.
- Apply bonding models to the structural study of organic molecules and transition metal coordination complexes.
- Illustrate the concepts of kinetics, thermodynamics, and equilibria through application to organic and transition metal chemistry.
- Develop skill in visualizing the particulate level as related to the concepts above.
- Relate empirical observations, particularly in the laboratory portion of the course, to concepts listed above.
- Demonstrate laboratory, data analysis, and scientific writing skills.

## COURSE COMPONENTS AND GRADING

**The course consists of:**

- 3 synchronous sessions per week – recorded and available for asynchronous viewing. Details about accessing the sessions (in Zoom or Panopto) will be provided on the course Canvas site.
- 1 synchronous discussion section per week – with TA via Zoom (access details are on the course Canvas site). Sessions will NOT be recorded.
- 1 synchronous laboratory session in certain weeks of the quarter: 1 orientation and 5 labs. See the 162 Laboratory Resources page of the course website for details. Labs will be attendance-required Zoom sessions with your TA at the times published in the UW Time Schedule. Sessions will NOT be recorded.
- Daily work in the ALEKS online learning environment
- Online prelab assignments and online submission of post-lab reports
- Online quizzes and exams

## GRADING

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

Quizzes and Exams	58%
Discussion section participation	7%
ALEKS Objectives & Mastery	20%
Laboratory	15%
<b>TOTAL</b>	<b>100%</b>

**Quizzes.** Quizzes will be delivered and submitted via Gradescope on Thursdays in weeks 2, 4, 6, & 7 during the regularly-scheduled class session. There will be four quizzes and one quiz score will be dropped before course grades are assigned (if you are unable to take a quiz, whether it is an excused or unexcused absence, that will be the dropped score). Each quiz will focus mainly on the most recent set of lectures, but chemistry is a cumulative subject by nature, so I will assume that you have a firm understanding of material from earlier in the quarter and from *previous 142/152 courses* when I write the quiz questions. **The Quizzes represent 42% of your course grade (14% each since one of the four will be dropped).**

**Final Exam.** The Final Exam will be delivered and submitted via Gradescope during the *last two class days of the quarter, Tu 8/17 & Th 8/19*. The Final Exam is cumulative. I will provide details about the percentage by points of each course unit on the final towards the end of the quarter. **The Final Exam represents 16% of your course grade.**

**Discussion Section Participation.** Discussion section will be conducted via Zoom during the regularly-scheduled discussion section time. 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. **The Discussion Section Participation category represents 7% 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.** 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.**

**Laboratory.** The Laboratory portion of this course will be conducted via Zoom during the regularly-scheduled lab session. More details about lab can be found on the 162 Lab Canvas page. The lab score is made up of a remote-labs orientation session and assignment and five labs (prelab, Zoom, and report). **The Laboratory category represents 15% of your course grade.**

**Grade Distribution.** The final mean GPA in Chemistry 1x2 generally falls within the range **2.6-2.9**. 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.

**Monitor your Scores.** Your scores for the various assignments, reports, and exams will be recorded using the online Gradebooks in Canvas ([canvas.uw.edu](https://canvas.uw.edu)). The lab assignments will be recorded on the Chem 162 Lab Resources page and the course component scores from ALEKS and the 162 Labs site in Canvas will be migrated to the Chem 162 course gradebook periodically throughout the quarter

## 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, lab reports, 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, lab reports, 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 the availability window for an exam or quiz unless an instructor explicitly allows for that collaboration.

### Specific policies for lab reports

During remote learning, it is presumed that the data you submit in your lab reports is only what was provided to you by your instructor.

All data analysis and written/typed calculations and responses that you submit should be yours alone.

We understand that it can be difficult for students to discern what constitutes good-faith teamwork on lab reports, and what constitutes plagiarism or cheating. While we often find examples of explicit plagiarism in which lab reports are directly copied from a student in the current quarter or an earlier quarter, we also find many cases of students “over collaborating,” resulting in reports that are essentially identical or extremely similar with only minor edits made to achieve minimal differences between the reports. This does not meet our expectation that you are submitting your own independent work. In short, if you have not done something yourself, do not attempt to pass it off as original work. If you have questions about what might cross the line, please do not hesitate to ask your lab or class instructor prior to submitting your work. You will not get in trouble for asking this type of question!

## LECTURES

**Lectures.** Lessons covering course content will be provided via Zoom during the published class time. These sessions will be recorded and available for viewing in Panopto as your schedule allows. Part of your expected work

is to participate in the Zoom sessions or view the lectures on Panopto and submit any questions that you have about the lectures to the course discussion board on Canvas.

**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 was covered in lecture).

## DISCUSSION SECTION

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

- TA fielding questions about lab, quizzes, general course content, etc.
- working with your remote 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, they will be quite challenging. A blank version of the worksheet will be available at least a week 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 on Thursday each week.

**Important note for Zoom Discussion Sections:** If you want to keep your video off to save on bandwidth that is fine, but you must interact with your colleagues through the audio in order to participate. If your computer microphone doesn't work, you can join the DS Zoom meeting through a phone connection. Ask your TA for details.

## 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 class content and discussions. The **ALEKS Pie** is a visual indicator of your progress towards mastering the required course content. Both your % completion of Objectives by the posted deadlines and the % completion of the ALEKS Pie by the end of the quarter will contribute to your total % score for the course and course grade. Several resources for understanding ALEKS can be found in the ALEKS module on the course website.

- **Make sure that you register for the ALEKS course specific to your section of 162** – use only the registration code found on the course website.
- **Make sure you enter your UW Net ID** (first part of your UW email address before the @ symbol) in your account details so your ALEKS scores can be correctly transferred to the course gradebook in Canvas.
- You, alone, are responsible for monitoring the deadlines for all ALEKS Objectives. 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.
- Note that it is not possible to open an ALEKS Objective a few hours before it’s due and be able to complete it successfully while also retaining the information and skills for easy recall later.

## QUIZZES AND EXAMS

**Quizzes.** There are four quizzes in this course, delivered via Gradescope (almost) every other Thursday (starting in Week 2). The lowest score among the four quizzes will be dropped. The dates for the quizzes are provided in the course schedule on Canvas. Quizzes will be delivered during the regularly-scheduled class time.

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 delivered via Gradescope during the last two regularly-scheduled class sessions for this course since Summer quarter does not have an official Finals Week. The final exam will be cumulative over the quarter. Information about length and coverage will be posted as the final exam dates near.

## CLASSROOM CLIMATE

UW Chemistry is committed to a welcoming and inclusive classroom environment. Diverse backgrounds, embodiments, and experiences are essential to the critical thinking endeavor at the heart of university education. 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. Please talk with me right away if you experience or observe disrespect in this class, and I will work to address it with you.

## 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](mailto:uwdrs@uw.edu) or visit [disability.uw.edu](https://disability.uw.edu).

## 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 as though it were a regular in-person session.
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.

## COURSE SCHEDULE

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

For the Lecture content, the number in bold is the lecture/lesson number; the numbers in parentheses are the reading assignments and book sections related to the lecture/lesson.

	Monday (Lect)	Tuesday (Lect & Lab*)	Wednesday (Disc Sect & Lab*)	Thursday (Lect Quizzes & ALEKS**)
Week 1 (6/21)	Intro. to Course <b>1.1:</b> Review of orbitals, LDS, and VSEPR (4.1-3)	<b>1.2:</b> Atomic Orbital Hybridization (4.4-7) <b>No labs this week</b>	<b>Worksheet 1</b> <b>No labs this week</b>	<b>1.3:</b> Molecular Orbital Model of Bonding (4.8-10) <b>ALEKS Initial K.C. Due 10pm</b>
Week 2 (6/28)	<b>1.4:</b> Magnetism (Box 4.2, p. 130); Diatomics (4.11)	<b>1.5:</b> UV-Vis Spect.(4.12; MT 2 (pp. 146-147)) <b>Remote-Labs Orientation</b>	<b>Worksheet 2</b> <b>Remote-Labs Orientation</b>	<b>Quiz #1 (Unit 1), Th 7/1</b> <b>ALEKS Obj. 1 (4.1-4.10)</b> <b>Due 11:59pm</b>
Week 3 (7/5)	<b>Holiday – no live class</b> <b>Watch recorded session...2.1:</b> Intermolecular Forces (6.1-8)	<b>2.2:</b> Phase Changes (8.11-12; 9.4 (pdf in Canvas) P <sub>vap</sub> ; Boiling (10.1-4) <b>Prelab 2 due; Lab 2</b>	<b>Worksheet 3</b> <b>Lab 2</b>	<b>2.3:</b> Phase Diagrams (10.5-7) <b>ALEKS Obj. 2 (6.1-5, 8.11-12, 10.4-6),</b> <b>Due 11:59pm</b>
Week 4 (7/12)	<b>2.4:</b> Structure of Solids (6.9-13; MT 3 (pp. 223-225))	<b>2.5:</b> Bonding in Solids; Semiconductors (7.1-5, 7.12-13) <b>No labs this week</b>	<b>Worksheet 4</b> <b>No labs this week</b>	<b>Quiz #2 (Unit 2), Th 7/15</b> <b>ALEKS Obj. 3 (6.9-6.13)</b> <b>Due 11:59pm</b>
Week 5 (7/19)	<b>3.1:</b> Solubility (10.8-9); Thermo of Solutions (10.12-13)	<b>3.2:</b> P and T Effects on Solubility (10.10-11); Molality (10.14) <b>Prelab 3 due; Lab 3</b>	<b>Worksheet 5</b> <b>Lab 3</b>	<b>3.3:</b> Colligative Properties (10.15-16) <b>ALEKS Obj. 4 (9.4, 10.8-14)</b> <b>Due 11:59pm</b>
Week 6 (7/26)	<b>3.4:</b> Colligative Props. (10.17); P <sub>vap</sub> of Binary Solns (10.18)	<b>4.1:</b> The d-block metals; Coordination complexes (17.1-6) <b>Prelab 4 due; Lab 4</b>	<b>Worksheet 6</b> <b>Lab 4</b>	<b>Quiz #3 (Unit 3), Th 7/29</b> <b>ALEKS Obj. 5 (10.15-17)</b> <b>Due 11:59pm</b>
Week 7 (8/2)	<b>4.2:</b> Isomers (17.7)	<b>4.3:</b> Crystal Field; Spectrochem. Series; Magnetism (17.8-12) <b>Prelab 5 due; Lab 5</b>	<b>Worksheet 7</b> <b>Lab 5</b>	<b>Quiz #4 (Unit 4), Th 8/5</b> <b>ALEKS Obj. 6 (17.2-17.10)</b> <b>Due 11:59pm</b>
Week 8 (8/9)	<b>5.1:</b> Aliphatic Hydrocarbons (19.1-3, 7)	<b>5.2:</b> Organic Rxns (19.4-6, 8) <b>Prelab 6 due; Lab 6</b>	<b>Worksheet 8</b> <b>Lab 6</b>	<b>5.3:</b> Functional Groups (20.1-8) and polymers (limited parts of 9-10, 13-15) <b>ALEKS Obj. 7 (19.1, 19.2, 19.5)</b> <b>Due 11:59pm</b>
Week 9 (8/16)	Wrap-up ahead of Final	<b>Final Exam Pt 1</b> <b>No labs this week</b>	<b>Worksheet 9</b> <b>No labs this week</b> <b>ALEKS Obj. 8 (195, 20.1-5) and Pie progress Due 11:59pm</b>	<b>Final Exam Pt 2</b>

\***LABS:** prelabs are due 8:30am on Tuesdays; reports for Labs 2, 5, & 6 are due 11:55pm the day after lab; experiments 3 & 4 are due 11:55pm 1 week after lab

\*\***ALEKS** deadlines are 11:59pm Thursdays except for last Obj (#8): deadline is Wed night 8/18; last Knowledge Check of the quarter will be after Obj #7; all ALEKS Pie Progress work will be due by 11:59pm on Wed 8/18