

# CHEMISTRY 162 A SUMMER 2020 (SLN: 10699)

## SYLLABUS

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

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

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

## 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: **XXX-XXX-XXX**; 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	Emma Cave	<a href="mailto:ecave@uw.edu">ecave@uw.edu</a>	Wed	Tues
AB	Laurence Giordano	<a href="mailto:lgio3w@uw.edu">lgio3w@uw.edu</a>	Wed	Tues
AC	Liam Wrigley	<a href="mailto:lw62@uw.edu">lw62@uw.edu</a>	Wed	Wed
AD	Ashley Dostie	<a href="mailto:amdostie@uw.edu">amdostie@uw.edu</a>	Wed	Wed
AE	Laurence Giordano	<a href="mailto:lgio3w@uw.edu">lgio3w@uw.edu</a>	Wed	Tues
AF	Liam Wrigley	<a href="mailto:lw62@uw.edu">lw62@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 from 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).
- **Study Guide, Chemical Principles**, 7th ed., Zumdahl/Kelter (*optional*).
- **UW General Chemistry 162 Laboratory Manual, Autumn 2019-Summer 2020** (Hayden McNeil; hard copy from UW Bookstore (free shipping) or 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 run online with your TA and section 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).
- **Daily online access** to Canvas ([canvas.uw.edu](https://canvas.uw.edu/)) and the Zoom app (within Canvas or at [washington.zoom.us](https://washington.zoom.us)).

You can look for [WA State Drive-in wifi hotspots](#) if needed. For Discussion and Lab Sessions you must be able to participate in Zoom calls by voice. If your computer does not have a microphone, you may need to log in with your phone.

- **Ability to convert a sheet of paper and/or file into a pdf.** You do not need a separate scanner. Free apps are available for smartphones – see details in the Gradescope instructions on the Labs website.
- **You do NOT need a printer.**

## 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.
- Develop laboratory, data analysis, and scientific writing skills.

## COURSE COMPONENTS AND GRADING

**The course consists of:**

- 3 lecture lessons per week – via Zoom meetings or Panopto Recordings in Canvas – these will be recorded.
- 1 discussion section per week – with TA via Zoom Meetings in Canvas. These will NOT be recorded.
- 1 three-hour laboratory session certain weeks of the quarter (5 labs total – Labs will be run online with your TA and section at the times published in the UW Time Schedule. See the 162 Laboratory Resources page of the course website for details.) These 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	42%
Final exam	16%
Discussion section participation	7%
ALEKS Objectives & Mastery	20%
Laboratory	15%
<b>TOTAL</b>	<b>100%</b>

**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.**

**Quizzes.** Quizzes will be delivered via Canvas 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. 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 courses* when I write the quiz questions. **The Quizzes represent 42% of your course grade (13% each).**

**Final Exam.** The Final Exam will be delivered via Canvas during the regularly-scheduled final exam session for this course. 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 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). 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

Your submissions for online assignments and exams should be your own, individual work unless explicitly told otherwise. You will be signing and submitting an honor code statement for this course.

For exams and/or quizzes, you may not seek out or accept any input from other individuals nor should you communicate with other members of the class or provide assistance to other students during or after the assignments unless an instructor explicitly allows for that collaboration. This also prohibits the sharing of content from any assignments, quizzes, exams, etc. with 3rd-parties such as Chegg, CourseHero, Reddit, or any other non-UW course content repositories.

It is presumed that the data you submit in the lab reports is what was provided to you by the instructor. All data analysis and written/typed calculations and responses that you submit should be yours alone. We often find examples of plagiarism in which lab reports are copied from someone else, or from an earlier quarter. 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.

Failure to adhere to this code of ethics will result in referral for possible disciplinary action as described in the Student Conduct Code.

## 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 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 your section of 162.**

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 via Canvas (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 Canvas 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 quiz length and coverage will be posted as the final exam date nears.

## 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](mailto: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](mailto:uwdrs@uw.edu) or visit [disability.uw.edu](http://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 162 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.*

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 (6/22)	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 (6/29)	<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 7/2</b> <b>ALEKS Obj. 1 (4.1-4.10)</b> <b>Due 11:59pm</b>
Week 3 (7/6)	<b>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 (7/13)	<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 7/16</b> <b>ALEKS Obj. 3 (6.9-6.13)</b> <b>Due 11:59pm</b>
Week 5 (7/20)	<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 (7/27)	<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 7/30</b> <b>ALEKS Obj. 5 (10.15-17)</b> <b>Due 11:59pm</b>
Week 7 (8/3)	<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 8/6</b> <b>ALEKS Obj. 6 (17.2-17.10)</b> <b>Due 11:59pm</b>
Week 8 (8/10)	<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, 19.7)</b> <b>Due 11:59pm</b>
Week 9 (8/17)	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 (20.1-20.5), 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; for last Obj (#8), deadline is Wed night; last Knowledge Check of the quarter will be after Obj #7