See p. 2 for a Table of Contents.
See the last page (p. 28) for a summary of exam and homework dates.

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CHEM 1071 General Chemistry I
for Physical Scientists and Engineers
and
CHEM 1071H Honors Chemistry I
Fall 2025 Syllabus

3 credits

Classes: Tues. 9/2/25 – Wed. 12/10/25

MWF 9:05 – 9:55 AM **Bruininks 230** (Section 1 of 1071 & 1071H)
TTh 11:15 AM – 12:30 PM **Smith 100** (Section 2 of 1071 & 1071H)

Instructor Information:

Prof. Doreen Geller Leopold dleopold@umn.edu
211 Smith Hall (612) 626−2047
Office Hours / Study Sessions: M & W 11:15 – 12:45 in Smith 111

General Course Information: Chemistry 1071 and 1072 (each 3 credits) and their Honors equivalents (1071H, 1072H) are introductory lecture courses accompanied by separate lab courses (Chem 1065 for 1071 and 1071H; Chem 1066 for 1072 and 1072H, each 1 credit). They are designed to help prepare future majors in science (including chemistry) and engineering. Either lecture/lab pair satisfies the liberal education physical sciences requirement.

Corequisite: Chem 1065, a 1-credit lab that is a separate course from Chem 1071 or 1071H. Labs do not meet during the first week of classes (Tues. Sept. 2 – Fri. Sept. 5).
Our general chemistry labs (Chem 1065 and 1066) are directed by Prof. Michelle Driessen and Dr. Samantha Houchlei. They can be reached at **genchem@umn.edu**.

Math Prerequisite: Placement into Math 1271 (Calculus I)
or a grade of at least C- in Math 1151 (Precalculus II) or 1155 (Intensive Precalculus)
Note: calculus is *not* used in Chem 1071 or 1071H. Meeting these math prerequisites is considered a sign of good algebra skills, which we will use in many chemistry calculations.

Registration Issues: Contact Nancy or Nick in Smith 115 (624−0026, chemfaq@umn.edu)

Required Materials: Textbook (eBook) and ALEKS online courseware.

"Chemistry: The Molecular Nature of Matter and Change,"
by Martin Silberberg and Patricia Amateis (McGraw-Hill, 10th Ed., 2024).

The Silberberg/Amateis eBook and the ALEKS online courseware are available as a package for one semester, and both are required for this class. The eBook is accessed from ALEKS, and students can log into ALEKS from our Canvas site (https://canvas.umn.edu/courses/517853). Access to this package lasts **18 weeks**, starting when each student registers for our class' ALEKS section (for example, Thurs. Aug. 21 to Wed. Dec. 24 would be 18 weeks).

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Required Materials (continued): The ALEKS/eBook package is included in Course Works ***Complete***, for which students pay a flat semester fee of $279. For students who choose Course Works ***Select*** because they prefer to pay for materials for each of their courses separately, the price for the ALEKS/eBook package is **$75.64**.

Optional Materials: A printed textbook (looseleaf format, 3-hole punched) is available at the Bookstore for the low, low price of **$40**. This economical option is available only to students who are opted into the eBook through either version of Course Works (Complete or Select). The printed text includes the entire book, not just the chapters covered in our class. This can be useful for students planning to refer to their chemistry text in the future (e.g., in classes having general chemistry as a prerequisite, to study for the MCAT, etc.).

Calculator: For exams, students will need a *non-programmable, non-graphing scientific* calculator. It needs to have exponential functions and to display numbers in scientific notation (e.g., 6.02×10^{23}).
The **TI-30X IIS** (pictured here) has a convenient two-line display and costs $15.49 at the Bookstore (and it is available on Amazon in various colors!).
The **TI-30XA** has a one-line display and costs $12.49 at the Bookstore.
Generally, any scientific calculator that is not programmable or graphing is okay. Ask the instructor or a proctor if you're not sure whether a particular calculator is allowed on exams.

Study Guides (continued on p. 10): A *Study Guide* is already posted on our class Canvas site for each chapter covered. To achieve a solid understanding of the material, students should supplement lectures by reading the book, especially the sections recommended in the Study Guides. They also list selected end-of-chapter problems, including those in the ALEKS homework (where they appear in slightly modified form).

Review Material (Chapters 1–4): The contents of **Chapters 1 through 4** of our textbook are considered to be prerequisite, high school-level topics and will not be covered in detail in our lectures. These chapters introduce the following topics:

Chapter 1: "Keys to Studying Chemistry: Definitions, Units and Problem Solving"
Chapter 2: "The Components of Matter"
Chapter 3: "Stoichiometry of Formulas and Equations"
Chapter 4: "Three Major Classes of Chemical Reactions"
(Precipitation, Acid-Base, and Oxidation-Reduction Reactions)

Homework "0" (due Fri. 9/26): This first online Homework on ALEKS has 40 questions on this review material.
The **Study Guide for Chapters 1–4** lists the recommended reading and end-of-chapter questions. These include the questions on ALEKS Homework 0 (in slightly modified form) as well as about 15 additional end-of-chapter questions that are helpful for reviewing.

Review Material (continued): The Study Guide for Chapters 1−4 also has a list of links to YouTube videos on these topics by Organic Chemistry Tutor, Khan Academy, and Wayne Breslyn. These **30 YouTube videos (5 hrs total)** are posted on our **Canvas Media Gallery**.

There will also be some questions on this review material on our **Exam 1**, which will be given on paper during our class meeting times on **Thurs. 9/25 (Section 2) or Fri. 9/26 (Section 1)**.

If you have time before the semester begins, you might want to register in ALEKS (through our class Canvas site) and start doing the questions in "Homework 0". Doing these problems will help you identify which topics you've already mastered and which would be helpful to review.

Topics to be Covered in Chem 1071 and 1071H: Chapters, sections, and pages listed below are from our textbook (eBook), Silberberg & Amateis' "Chemistry," 10th Ed., 2024.
For example, "5.3" means Chapter 5 Section 3.

Chapter 5, "Gases and the Kinetic−Molecular Theory"

5.2 Gas pressure and measurement
5.3 Gas laws and their experimental foundations
5.4 Rearrangements of the Ideal Gas Law
5.5 Kinetic Molecular Theory: a model for gas behavior
5.6 Real Gases: deviations from ideal behavior (to the middle of p. 239 only)

Chapter 6, "Thermochemistry: Energy Flow and Chemical Change"

6.1 Forms of energy and their interconversion
6.2 Enthalpy: changes at constant pressure
6.3 Calorimetry: measuring the heat of a chemical or physical change
6.4 Stoichiometry of chemical equations
6.5 Hess' Law: finding ΔH of any reaction
6.6 Standard enthalpies of reaction: $\Delta H°_{rxn}$

Chapter 7, "Quantum Theory and Atomic Structure"

7.1 Nature of light
7.2 Atomic spectra
7.3 Wave-particle duality of matter and energy
7.4 Quantum-mechanical model of the atom

Chapter 8, "Electron Configuration and Chemical Periodicity"

8.1 Characteristics of many-electron atoms
8.2 Quantum-mechanical model and the periodic table
8.3 Trends in 3 atomic properties (size, ionization energy, electron affinity)
8.4 Atomic properties and chemical reactivity

Topics to be Covered (continued):

Chapter 9, "Models of Chemical Bonding"

9.1 Atomic properties and chemical bonds
9.2 Ionic bonding model
9.3 Covalent bonding model
9.4 Bond energy and chemical change
9.5 Between the extremes: electronegativity and bond polarity

Recommended reading but not included in our lectures, ALEKS Homeworks or exams:

9.6 Introduction to metallic bonding

Chapter 10, "The Shapes of Molecules"

10.1 Depicting molecules and ions with Lewis structures
10.2 Valence-shell electron-pair repulsion theory (VSEPR)
10.3 Molecular shape and molecular polarity

Chapter 11, "Theories of Covalent Bonding"

11.1 Valence-bond (VB) theory and orbital hybridization
11.2 Modes of orbital overlap and the types of covalent bonds
11.3 Molecular orbital (MO) theory and electron delocalization

Chapter 12, "Intermolecular Forces: Liquids, Solids, and Phase Changes"

12.1 Types of intermolecular forces
12.2 Overview of physical states and phase changes
12.3 Quantitative aspects of phase changes
12.4 Properties of liquids
12.5 Uniqueness of water

Recommended reading but not included in our lectures, ALEKS Homeworks or exams:

12.6 Solid state: structure, properties and bonding (pp. 492 − 495, 501 − 504)
12.7 Advanced materials (p. 513 on polymers, pp. 518 − 519 on nanotechnology)

Chapter 13, "The Properties of Mixtures: Solutions and Colloids"

13.1 Types of solutions: intermolecular forces and solubility

(The rest of Chapter 13 will be covered next semester in Chem 1072)

Chapter 15, "Organic Compounds and the Atomic Properties of Carbon"

15.1 Special nature of carbon and the characteristics of organic molecules
15.2 Structures and classes of hydrocarbons
15.4 Properties and reactivities of common functional groups
15.5 Synthetic macromolecules (pp. 661 − 663 only)

Chem 1071H Honors Project: We have a total of 70 students registered for 1071H this semester, 31 in the MWF 9:05 class (Section 1) and 39 in the TTh 11:15 class (Section 2). They will take the same exams and do the same ALEKS homeworks as will students in the same section of 1071, and they will be graded on the same scale.

Students in 1071H will also do an **Honors Project**. It will earn a "completion grade", meaning that it will not affect their course grade, except for incurring a grade penalty for 1071H students who do not complete it. The grade penalty would be one-third of a grade point, e.g., a reduction from A to A-, from A- to B+, etc.

The Honors Project will focus on learning about current research and researchers in the Chemistry and related Departments at the U, and sharing these findings with other 1071 and 1071H students. Our Chemistry faculty and affiliated faculty in other Departments span a broad range of research areas, as described at these two links:

https://cse.umn.edu/chem/core-faculty

https://cse.umn.edu/chem/affiliated-faculty

To get organized, we will meet with 1071H students (in both sections) on non-NOVA **Friday afternoons at 4:00 – 5:00** on the following **7 dates**:
Sept. 12, Sept. 26, Oct. 10, Oct. 24, Oct. 31, Nov. 14, and Dec. 5.
The Sept. 12 meeting will be in Bruininks 230 and the others in Smith 100. We will also set up additional meetings in November and December for students' presentations, as needed.

In September, each 1071H student will submit a ranked choice of 3 faculty to interview, chosen from among those listed in the above two links. We'll then organize teams of three students with common interests, with each team interviewing the same faculty member and two of their group members (undergrad or graduate students or postdoctoral associates).
Please do not initiate these interviews until we get organized, to avoid duplication!

Each team of three students will complete the following requirements by **Wed. Dec. 10**:

(1) Prepare an in-person presentation about 8 minutes long for the other 1071H and 1071 students who wish to attend, and present it during our November or December meetings.

(2) Record a video of this presentation and submit it on Canvas. These will be posted in the Media Gallery so they are accessible to all of this semester's Chem 1071H and 1071 students.

(3) Submit a brief (2 page) written summary, which will be posted along with the video.

We will work out the presentation schedules and other details during our meetings.

This Honors Project should be fun and interesting. With 69 students enrolled in the two sections of 1071H this semester, we will learn about the activities of about 23 different chemistry-related research groups on campus! These presentations may even spark an interest by some of our students in joining a research group or investigating a possible new career path!

- **Our Course Canvas Site:** https://canvas.umn.edu/courses/517853

To access Canvas:

1. Connect to MyU.umn.edu, log in, click the "My Courses" tab, select the appropriate class link, and follow this to our class Canvas site. ***OR…***
2. Go directly to https://canvas.umn.edu , login, and select the appropriate class.

Our Canvas site will include the following resources (most are in the **"Modules"** section):

- Syllabus (posted as a pdf on the **"Home"** page and also in the **"Syllabus"** section)
- Link to our online courseware site for eBook access and homework (under **"ALEKS"**)
- New Canvas **Announcements** (you may want to turn on your notifications for these)
- Additional announcements made in class, and a note on what was covered in the last lecture (*"Where Are We Now?"*), posted as a pdf on the **"Home"** page and updated each week.

- Lecture slides (already posted for the whole semester in **"Modules"**); some calculations discussed in class will also be posted after some lectures
- Study Guides for each chapter with suggested reading and more end-of-chapter problems (already posted for the whole semester in **"Modules"**)

- Lecture videos starting with Chapter 5, posted in the **"Media Gallery"** (recorded during a previous semester for Chapters 5 - 12 and parts of Chap. 13 and 15)
- YouTube videos (by others) to help review topics in Chapters 1 - 4, in the **"Media Gallery"**

- Your scores on exams, homework, and ChimeIn, posted under **"Grades"**

To be posted in the "Our Exams" section in **"Modules"**:

- Exam Review Sheets, to be posted at least one week before each exam
- Fall 2024 exam questions for practice (already posted), detailed answer keys (to be posted)
- Answer Keys for our exams (posted after both sections have taken their exams)
- Guidelines for how to estimate your course grade (to be posted later in the semester)

- ***General Chemistry Website*** https://sites.google.com/umn.edu/general-chemistry/

This website includes:

- Chem 1065 lab schedule and syllabus
- Schedule for walk-in tutorial hours in Fraser 140.

This tutor room is staffed from 9 to 5 on Mon. - Thurs., from 9 to 4 on Fri., and Zoom hours are available until 7 pm on Mon. - Thurs.

A separate schedule for help with lab reports will be posted.

Accessing the eBook and ALEKS: Our ALEKS site is now open. To access it, click on the "ALEKS" link at the left of our Canvas site. It will take you directly to the ALEKS site associated with our Chem 1071 and 1071H class. ALEKS opens in a separate window. When you register in ALEKS through our course Canvas site, you will not need to use a separate ALEKS course code.

Click on Login (if you have used ALEKS at the U of M before, you have an existing account) or SIGN UP.

Fill out student information if you are creating a new account.
For ALEKS to keep track of your Homework score and transfer it to Canvas, you will need to **enter your U of M email address in both the email AND "Student ID" fields**.

The ALEKS Support Team can be contacted if needed, initially or during the semester:

Phone: (800) 258−2374
Email: https://www.aleks.com/support/form

Hours (Eastern Standard Time)	Sunday, 4:00 PM to 1:00 AM
	Monday − Thursday, 7:00 AM to 1:00 AM
	Friday, 7:00 AM to 9:00 PM

ALEKS Homework Assignments:

There will be 9 ALEKS Homework assignments ("0 " and A− H).

These will be ***due by 11:59 pm on Fridays*** (except for the last one, Homework H, which will be due on the last day of classes). See the list of due dates on the last page of this syllabus (p. 28), and on the class schedules (pp. 24 - 27).

The ALEKS online Homework system gives each student essentially the same end-of-chapter problems (as selected by the instructor and listed on the Study Guides). ALEKS creates slight modifications having different numerical values or sample molecules, so different students get slightly different problems. This consistency encourages group work, while discouraging simply copying each other's answers).

Homeworks A through H have a total of 185 questions worth 0.1 point each (for a total of 18.5 points), and the review Homework "0" has 40 questions each worth 0.05 point (for a total of 2.0 points).

The maximum total Homework score that can be applied to the course grade is 16.0 points.
For example, if you have earned 16.0 of the 20.5 possible points, then you have earned the maximum number of homework points that can count toward your course grade. (Our scoring system does not make use of the initial Math Review questions, or the ALEKS pie.)

Don't be overly concerned (from the perspective of your homework grade) with answering every ALEKS question correctly. It's more important to do the homework problems with the *goal of understanding them*, rather than simply getting the correct answer. One sign of understanding is that the student can confidently answer similar (but not identical) questions on our exams. Each exam question is worth 1.0 point, 10-times as much as each ALEKS homework question.

ALEKS Homework Assignments (continued):

Homework scores will be posted automatically on the Canvas grade book. They will be posted as if each question in Homeworks A−H is worth 1.0 point rather than 0.1 point (and 0.5 point rather than 0.05 point for questions in Homework "0"). So, to convert your posted homework score to its actual value, divide by 10 and set a maximum of 16 points total for the 9 homeworks.

ALEKS' initial "**Math Review Module**" has some questions (chosen by ALEKS) to help students review some high school math topics that may be useful in our class this semester. (These math review questions are optional; they do not earn points.)

This is followed by "**Homework 0**", which has 40 questions on some high school-level review topics from Chapters 1−4. Each of these can earn 0.05 point toward the course grade (so 2.0 points total for the 40 problems). The 8 subsequent Homework assignments, A−H, each have between 20 and 30 questions worth 0.1 point, with a total of 185 questions (worth 18.5 points).

Homework assignments are available on ALEKS two or more weeks before their due dates. So, there is ample opportunity to work on them early, preferably in parallel with our discussions of the same topics in lectures.

You can click "submit" to submit your homework. They can be submitted up to a week *after* their due dates, with a 20% point penalty applied to the questions answered during the *late submission week.* (ALEKS will not ask you to redo the questions you have already answered correctly.) So, questions answered correctly during the week after their due dates each earn 0.08 point rather than 0.10 (or 0.04 point rather than 0.05 for questions in Homework "0").

Even if a you forgot to click "submit", your homework will be automatically submitted at the end of the late submission week. If some or all of the problems were answered correctly by the due date, the 20% late penalty would *not* be applied to those problems.

In general, Exams 1 − 4 will include material covered on Homework assignment(s) due on Friday of the exam week or earlier. Of course, it is a good idea to study the relevant problems *before* taking the exam covering those topics, even when the exam occurs before the Homework due date. More specific information about possible topics each exam will cover will be posted at least a week earlier in the *Exam Review Sheet*.

On the ALEKS Homeworks, students have 3 "question attempts" (which will often have different numerical values or sample molecules), and 3 "tries" per question attempt.
A second "assignment attempt" is also available to earn more points after the homework has been submitted, as long as it is still before the end of the one-week late submission period.
When doing the second "assignment attempt", you'll only be asked the questions you did not previously answer correctly (and they will have different numerical values or sample molecules). This second cycle again allows 3 "question attempts" with 3 tries each.

Homework problems can subsequently be done in **review mode** an unlimited number of times (without earning additional credit) to help learn the material and prepare for exams.

Study Guides: As noted on p. 3, a Study Guide is posted on Canvas for each chapter covered (Chapters 5−12 and parts of Chapters 13 and 15). The first one covers selected topics from Chapters 1−4. The Study Guides list recommended reading and end-of-chapter problems in the textbook, organized by topic in the order we will cover them in class.

Many of the end-of-chapter problems in the Study Guides also appear in the online ALEKS Homeworks. The Study Guides also include other problems that were not available on ALEKS but are also helpful to learn the material and prepare for exams. The problems that are included in the Homeworks (in modified form) are shown in parentheses in the Study Guides so students can easily cross-reference them. The additional problems (not also in the ALEKS Homeworks) were selected from among those with red numbers in the eBook, indicating that their answers are provided there.

We will also refer to the corresponding sections in the Study Guide at the start of lectures to outline the topics to be discussed, and at the end to preview topics to be covered in next class.

Midterms and Final Exams: ***See the last page (p. 28) for exam dates***
Our four midterm exams, as well as the Final, will be taken in person on paper and will consist entirely of *multiple choice questions*. The midterms will last 50 minutes and will be given during the usual class meeting times.

We have reserved a second exam room for our exams, in addition to the usual classroom, so students can have alternate seating (with an empty seat in between). Assignments to these exam rooms will be announced in class.

Students in the class that meets on Mon., Wed., and Fridays (Section 1) will take the Friday midterms (and the Monday Dec. 15 final), and students in the class that meets on Tues. and Thurs. (Section 2) will take the Thursday midterms (and the Sat. Dec. 13 final). ***If you need to switch any of your exam days, please email Doreen before the exam to request permission.***

Exam 1 will cover Chapter 5 on *Gases and the Kinetic Molecular Theory*. It will also include 5 or 6 questions (worth 5 or 6 out of 16 points) on the review material in Chapters 1−4.

The **Final Exam** will be 2.0 hours long and will be cumulative over the whole course. Final Exam days and times are determined by the University according to the class meeting times. The dates and times for our two sections' Finals are listed on the last page of this syllabus (p. 28).

An **Exam Review Sheet** will be posted at least a week before each exam with a list of specific topics that may be included. These will be posted under **"Modules"** in the section titled **"Our Exams"**. In general, the midterms will cover some of the material discussed in class up through the previous week (and some review questions the week of the exam). Exams will often include questions that are similar (but not identical) to those on the ALEKS Homeworks, the additional end-of-chapter questions in the Study Guides, in-class problems, and concepts discussed in class and described in the posted lecture slides and videos.

Exam Formats:
Exam questions will all be multiple choice, and answers will be recorded on "bubble sheets" which have up to 10 answers per question.
Only the answers recorded on the bubble sheet will be graded. Students are welcome (encouraged) to write on the exams, but work done there will not be graded.

For questions with multiple answers listed, there will be **no penalty for incorrect answers**, so students should answer every question, even if it is only a guess.
Only one answer should be selected per question.
No credit will be given if two or more answers are bubbled in for a given question.

Some questions will have several parts that are each True/False questions. In that case, half of the allotted credit for that part will be subtracted for an incorrect answer, with a minimum of 0 points for the whole question. No points will be added or subtracted if no answer is filled in. So in this case, it may be better to omit answering a part than to make a purely random guess.

Equation Sheet:
Relevant portions of the equations, constants, conversions, etc. shown on pp. 22−23 of this syllabus will be provided with our midterm exams, and the whole equation sheet will be included with the Final Exam. It is a good idea to familiarize yourself with it (e.g., you can refer to it while doing the online Homeworks) so you can access the information quickly during an exam.

Notes: *No additional notes* (other than the equation sheet provided) are allowed during exams.

Pencils: Be sure to bring to each exam a couple of pencils with good erasers.
Since the exams will be automatically graded, answers must be clearly selected on the bubble sheets, and clearly erased if changed. (If a nonerasable pen is used and an answer is crossed out and another filled in, the scanner with interpret that question as having two chosen answers and will give no credit.)

ID Cards (U Cards): Students should bring a photo ID (U Card or driver's license) to each midterm exam and to the Final, since the proctors may check or spot-check these. Also, you will need to bubble in your 7-digit student ID number (printed on your U Card).

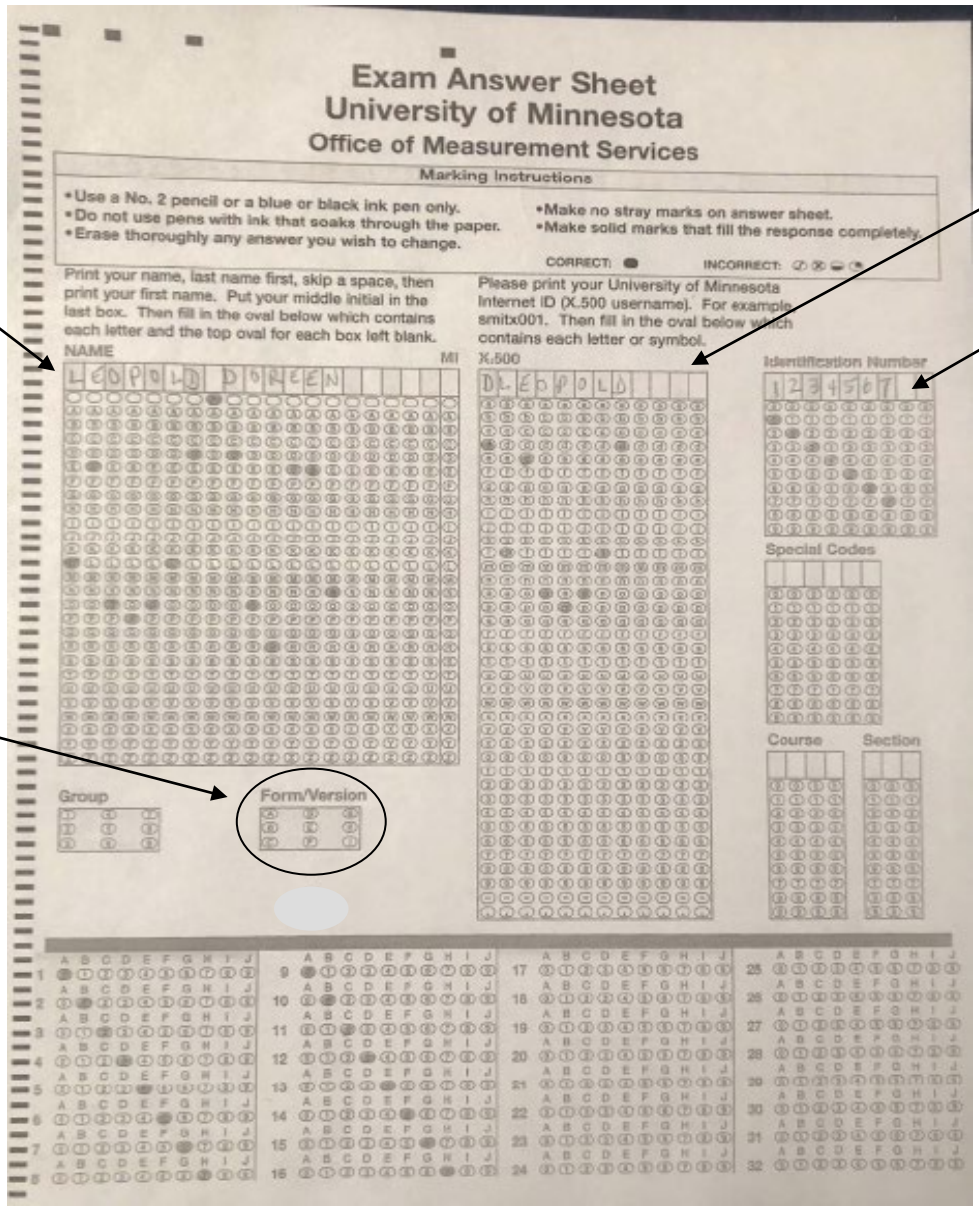
Proper Bubbling Technique: For your grade to be correctly posted on Canvas, you will need to bubble in the following items, and also print them in the boxes above the bubbles:

- your student ID number (a 7-digit number printed on your UCard)
- your X500 (what precedes "@umn.edu" in your email address)
- your name (last name [space] first name (or as much as will fit))
- the version of your exam (A, B, C, etc.) which will be printed at the top of page 2 of the exam

Just printing the letters and numbers will not work - they also have to be bubbled in.
Also ***sign the back*** of the bubble sheet at the bottom (where it says "Signature").

See the sample bubble sheet on the next page.

Sample Bubble Sheet: Fill in the 5 items indicated here (and also your answers, of course!)



Your Name (Last name, First name)

Your U of M email (omit @umn.edu)

Your U of M ID number (a 7-digit number)

Your Exam Version (A, B, C, etc.) on p. 2 of your exam

Also, on the back side of the bubble sheet, sign your name at the bottom (where it says "Signature").

Exams (continued):
Cell phones or other electronic communications devices may not be used (and may not be present within easy reach) during exams. (If you need to have your phone accessible during the exam, please first obtain permission from a proctor or the instructor.)

Calculators must be non-programmable and non-graphing (also see p. 3). Students are not allowed to share calculators during exams. Although we will bring about 4-5 extra calculators to each exam room, these may not be enough to provide for all of the students who forget theirs. So it is important to bring your calculator to exams.

Regrade Requests: An "Announcement" will be posted on Canvas to alert students when the exam scores have been posted. Requests for regrades should be made as soon as possible after the scores are posted. If you find a discrepancy between your posted score and the one you expected (by comparing the answers you circled on your exam to those on the posted answer key), we can look at your bubble sheet to try to identify the problem. Occasionally a bubble sheet gets graded against the wrong version of the answer key, or a score is entirely missing from Canvas. So, students should definitely check their exam scores as posted on Canvas.

Grading Methods: Course grades will be determined based on scores on the online Homework, the midterm exams (Exams 1 through 4), and the Final Exam, as follows:

	Points	%
Online Homeworks (16 points maximum out of 20.5 possible points earned)	16.0	16.0 %
4 Midterm Exams (16 points each)	64.0	64.0 %
Final Exam (40 problems, 20 points, ½ point per question)	20.0	20.0 %
Total	100.0 points	100.0 %

The "Extra Credit" earned by answering ChimeIn questions in class (up to 2.0 points total) will be added to this total. See p. 15 for information on ChimeIn.

Course grades will be determined by a "hybrid" method that combines the absolute grading scale shown below with an adjustment applied at the end of the semester (if needed) to *lower* some of the thresholds (i.e., to improve students' letter grades). That is, if your total scores give the following percentages (out of 100 points), then your course grade is *guaranteed* to be *at least* as high as is listed below. Grades may be adjusted in a *favorable* direction at the end of the semester, but the thresholds listed below will *not* be raised.

	Percentages			
		C+	65.0 – 69.9 %	
A	90.0 – 100 %	C	60.0 – 64.9 %	
A–	85.0 – 89.9 %	C–	55.0 – 59.9 %	(lowest passing grade)
B+	80.0 – 84.9 %	D+	50.0 – 54.9 %	
B	75.0 – 79.9 %	D	40.0 – 49.9 %	
B–	70.0 – 74.9 %	F	≤ 39.9%	

Grading Methods (continued):

Sample calculation for a student who took all 4 midterms:

Say a student got a total of 48.0 out of 64.0 points on their 4 exams,
14.0 out of 16.0 points on the online Homework, 14.0 out of 20.0 points on the Final Exam,
and 1.5 out of 2.0 points for the extra credit ChimeIn problems (see p. 15 for ChimeIn).
The total score is then 77.5 out of 100.0 points, or 77.5%.
According to the grading scale on p. 13, this corresponds to a course grade of (at least) B.

*Sample calculation for a student with an **excused absence** from one midterm*:

Say the total score on the remaining 3 midterms was 36.0 out of 48.0 points. If, as before, the student got 14.0 points on the Homework, 14.0 points on the Final, and 1.5 out of 2.0 points on the extra credit ChimeIn problems, then the total score is 65.5 out of 84.0 points, or 78.0%.
This again corresponds to a grade of (at least) B.

S/N Grading: For courses in which S/N grades are an option, the University policy is that a grade equivalent to C− or higher on the A−F scale will receive an "S", and a grade of D+ or below will receive an "N".

Excused Absence from a Midterm Exam: In general, our exams will not be administered at times other than those regularly scheduled. Students who are unable to take a midterm exam due to illness, a family emergency, a university-sponsored activity, religious observance, etc., can request an **excused absence** from the instructor. Or, sometimes simply arranging to take the other section's exam instead can resolve the conflict. In either case, the instructor should be contacted before the start of the exam, if possible. (An excused absence cannot be granted after a student has already taken an exam.) It is not necessary to provide a doctor's note for one-time illnesses for which one would not ordinarily be seen by a doctor.

Sometimes a student cannot be on campus for an exam due to a university-sponsored activity, such as an out-of-town team competition. In that case, it may be possible to arrange to take the exam at that location if a suitable proctor (e.g., the team's coach) is available there.

See above for a sample calculation of the overall percentage (out of 84 points rather than 100 points) for a student with an excused absence from one midterm exam (worth 16 points).
If circumstances require a student to request an excused absence from *more than one* of our four midterms, they should consult with the instructor to discuss the available options.

Incompletes: Students who have an excused absence from the Final Exam, and are passing the course with at least a C- based on their midterm and homework scores, may be eligible to receive a grade of "I" (Incomplete). The instructor should be notified before the Final Exam begins, if possible. Use of the "I" option in our Department is rare. An "Incomplete" form signed by the student (when able to do so) and by the instructor is required. This form will describe the arrangements to make up the Incomplete, which must be done by the end of the following semester.

ChimeIn Extra Credit In-Class Questions:

To respond to ChimeIn questions conveniently using your phone, install the Canvas app.

Students can earn up to 2.0 points of extra credit by answering questions in class through ChimeIn. This can be done using the student's laptop, iPad, phone, or other device that can access Canvas. In addition to providing a small amount (2.0%) of extra credit added to the total score, these ChimeIn questions can help strengthen students' understanding of concepts and calculations covered relatively recently in class. In addition, since relatively few people choose to ask or answer questions in such a large class, this more anonymous type of participation can increase students' sense of engagement and enjoyment of the class.

Earning 80% (or more) of the maximum ChimeIn credit will earn the full 2.0 points of extra credit. For each question that can earn credit, half credit will be given it is attempted but the answer is incorrect. No credit will be given if there is no response.
There will not be make-up options for the ChimeIn questions.

Each student's cumulative score will appear on their Canvas grades list in a single column labeled "ChimeIn". This score will be listed as the percentage of ChimeIn credit earned out of the maximum credit possible for all of the questions since the start of the semester. The Canvas Grades list will be updated a few hours after each class.

For example, if during the first week of class, 4 ChimeIn questions that can earn credit have been asked and a student answered all of them correctly, then the percentage listed would be 100%. Say that during the second week of class, 4 more questions were asked and the student answered 2 of them correctly and 2 incorrectly, giving a total of 6 questions answered correctly and 2 incorrectly out of 8 total questions asked. Then, the percentage earned would be updated as $(6 + 2 \times ½) / 8 = 7/8 = 87.5\%$.

At the end of the semester, a student with a cumulative ChimeIn percentage of 80.0% or more will earn the full 2.0 points of extra credit, whereas 40.0% will earn 1.0 point, etc. That is, the number of extra credit points earned by a student with a ChimeIn percentage of x % will be

$$(2.0 \text{ points}) (x\ \%) / 80\%$$ (with a maximum of 2.0 points).

These extra credit points will be added to the total points earned on the Homework and exams to determine the student's letter grade in the course. Since this is an extra credit option, it is not necessary for students to participate in ChimeIn to earn the course grades guaranteed by the thresholds listed on p. 13. For example, even without any extra credit, a total score of 75.0 points (i.e., 75.0% of 100.0 points) will guarantee a minimum course grade of B.

Withdrawals:
This semester, the last day a student can withdraw from (drop) a class *without* a "W" appearing on their transcript is **Monday, Sept. 15**. The last day a student can withdraw from a class (and receive a "W" on their transcript) *without* requiring their College's approval is **Monday, Nov. 10.**

Students who withdraw from Chem 1071 *before* **Monday, Nov. 3** are required to withdraw from Chem 1065 (lab) as well. Students who withdraw from Chem 1071 *on or after* **Monday, Nov. 3** can finish the lab and, if that class is passed, they can retake the lecture class without having to also retake Chem 1065. (There is no formal limit on when the lecture class can be retaken without the lab, but most students retake it the following semester.)

If a student is considering withdrawing from the class for academic reasons, it is a good idea to *discuss this first with the instructor*. The likelihood of passing the class (or of getting a satisfactory grade) is often much *better* than the student anticipates.

Students who do decide to drop the class should officially withdraw following the rules for their College. Students who drop will not have any records retained for use upon retaking the course.

Retaking the Course:
Students who wish to retake Chem 1071 after having already passed the Chem 1065 lab course should contact Nancy or Nick (Smith 115, 4-0026, chemfaq@umn.edu).

See Section 4(a) at this link: https://policy.umn.edu/education/gradingtranscripts

"**Repeating courses.** An undergraduate student may repeat a course only once, except as noted in section 4(c). The college offering the course may grant an exception to this provision."

Study Support: Asking questions during the instructor's office hours / study sessions, making use of the TA tutorial room in Fraser 140, and/or participating in a study group are some methods that can help students succeed in this course.

Tutorial Hours: https://sites.google.com/umn.edu/general-chemistry/tutoring-resources
As noted on p. 7, Frasier Hall 140 will be the site of free drop-in tutorial sessions conducted by general chemistry TAs during weekdays. This tutor room is staffed from 9 to 5 on Mon. - Thurs., from 9 to 4 on Fri., and Zoom hours are available until 7 pm on Mon. - Thurs. There will be a separate schedule for help with lab reports.

Study Groups: Organizing study groups and scheduling regular meetings to do the online Homework and prepare for tests is a good way to keep up with the material and clarify points of confusion. Since everyone will get essentially the same Homework problems with minor variations, working together can be a productive and enjoyable way to learn the material and share your knowledge with others.

If time allows, study groups can meet in Smith 111 (seats about 25 students) during Doreen's office hours (Mondays and Wednesdays from 11:15 am to 12:45 pm) and get help when needed.

Access and Disability Accommodations (DRC):
Students needing accommodations for access to class activities and materials should contact the Disability Resource Center (DRC) at 626−1333 https://diversity.umn.edu/
The DRC will email a letter to the instructor describing the student's accommodations and how we can facilitate an inclusive learning environment.

For exams, if the DRC recommends that extended times or other special accommodations are required, students are responsible for making arrangements with the DRC to take these tests under their supervision at the McNamara Alumni Center. **The exams should be taken at times that overlap the usual times at which the other students in our class will be taking them.** The DRC requires at least one week advanced scheduling of exams in their testing center. Students can make all of their reservations for the midterm exams and the Final early (e.g., when making the first reservation).

Issues with Your Instructor:
On occasion a student may have a concern or problem regarding this course. In general, the instructor will be quite willing to discuss this. If, however, a student wishes to discuss the issue with someone else as well, they should contact **Prof. Angela Perkins**, Director of Undergraduate Studies (aperkins@umn.edu). She will serve as a mediator in helping to resolve the issue.

Credits and Workload Expectations:
One credit is defined as equivalent to an average (over a full semester) of 3 hours of learning effort per week necessary for a student with an average level of preparation to achieve an average grade. For a 3-credit course, this corresponds to 3 cr. x 3 hours/credit = 9 hrs/week. This includes 3 x 50 minutes = 150 minutes (2.5 hours) spent attending lectures. To achieve an average grade (typically between B- and B in large introductory chemistry lecture classes), this guideline suggests that an additional 6.5 hrs/week should be spent studying - reading the textbook, doing the Homework problems and other problems recommended in the Study Guides.

Liberal Education Statement for Chem 1071 and 1071H:

Chem 1071 and 1071H, combined with the lab course, Chem 1065, satisfies the U of M's Liberal Education Physical Science Core requirement. Core courses are intended to provide an in-depth look at how knowledge is created in a particular discipline. Naturally, they provide content knowledge, but just as importantly, they teach "modes of inquiry":

How do workers in a particular field think?
How do they collect and process information?
How do they create/discover new knowledge?

By taking a distribution of core courses during your time at the U, you gain an appreciation for the similarities and differences among disciplines. Much as learning a foreign language helps you to better understand your own language, a distribution of core courses provides the perspective needed to understand a broad range of complex issues and can ultimately make you a better practitioner of your own chosen field. You learn different approaches to finding credible information, analyzing information, solving problems, and drawing reasonable conclusions based on facts. In doing so, you develop skills needed to be an informed citizen and a life-long learner.

In Chem 1071 and 1071H, we learn to understand chemical bonding and its basis in quantum mechanics, as well as thermochemistry and bond strengths, the behaviors of gases, and the attractions among molecules that affect the properties of liquids, solids and solutions. We describe how these topics fit together to form a coherent picture, allowing us to understand and make useful predictions about the world. To accomplish this, we do what scientists do all the time: we create ideas and then test their validities by applying them to new situations.

Moreover, using the language of math, we translate these ideas into quantitatively testable predictions. We will pose and solve many problems in this course and, by working through them, you are, in effect, doing what scientists do – you are taking concepts and their mathematical expressions and using them to enhance your understanding and to make predictions. You are doing the work of the field.

This aspect of our lecture course is particularly emphasized in the co-requisite laboratory course (Chem 1065). In the lab, you do experiments, test hypotheses, and record data. You analyze the data to obtain the clearest possible picture of the phenomenon you are studying. In some cases, you will also use the understanding obtained to offer workable solutions to practical problems. This is how scientists and engineers approach the world and, in following suit, you experience the core of these important aspects of human endeavor.

Student Learning Outcomes:
https://provost.umn.edu/academic-oversight/assessment-student-learning

Succeeding in Chem 1071 or 1071H (lecture) and Chem 1065 (lab) will help you come closer to achieving 6 of the 7 *Student Learning Outcomes* that together describe the anticipated capabilities of students who have earned their bachelor's degrees at the U of M:

• *Can identify, define, and solve problems:* These courses provide a vehicle for practicing quantitative problem solving and for learning to transcend merely algorithmic thinking. Many of the problems we will encounter in class discussions, homework and tests require the synthesis of both mathematical and conceptual modes of understanding.

• *Can locate and critically evaluate information:* With the abundant new chemical information introduced in these courses, often much of the challenge in solving a particular problem is figuring out what information is most pertinent. How can we distinguish between reliable factual information and mere conjecture? These skills will be further exercised in lab, where students work on extended, open-ended assignments.

• *Have mastered a body of knowledge and a mode of inquiry:* We will cover many useful principles of chemistry which are tied together by common threads, and together form part of a "body of knowledge". For example, you will gain a better understanding of how the attractive forces between invisible, individual molecules affect the observable properties of matter such as the melting points of solids, boiling points of liquids, and whether a substance is a gas, liquid or solid at room temperature. Learning how to approach and apply this knowledge involves practicing some of the "modes of inquiry" used routinely by chemists and, indeed, by all scientists and engineers.

• *Can communicate effectively:* In the Chem 1065 lab, you will develop your scientific writing skills through keeping laboratory notebooks and writing formal lab reports. You will also hone your oral communication skills through interactions with your lab team members, and by presenting reports on your experimental results.

• *Understand the role of creativity, innovation, discovery, and expression across disciplines:* Scientists' efforts to explain the world in new ways often require real creativity, and the discipline to pursue and effectively communicate original ideas despite their initial derision by others. For example, we will study the history of the development of quantum mechanics in the early 1900's, when inexplicable experimental results demanded new theoretical explanations that seemed then (and now) to be highly counter-intuitive. Yet, these models now form the basis of our understanding of chemical bonding. We will see how physics and math blend seamlessly with chemistry, and how chemistry permeates many other disciplines.

• *Have acquired skills for effective citizenship and life-long learning:* Chemistry plays a central role in many societal issues. The knowledge and critical thinking skills developed in these courses, as well as in their second semester counterparts, Chem 1072 and 1066, can help you form a foundation for effective decision making and informed citizenship.

Additional Links to Recommended U of M Syllabus Policy Statements:

WEBPAGE: https://policy.umn.edu/education/syllabusrequirements-appa

1. Academic freedom and responsibility:
Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. For more on academic freedom, see: https://regents.umn.edu/sites/regents.umn.edu/files/2019-09/policy_academic_freedom_and_responsibility.pdf

2. Student conduct code:
Link to a pdf file of the Student Conduct Code (last amended June 2022): https://regents.umn.edu/sites/regents.umn.edu/files/2020-01/policy_student_conduct_code.pdf

3. Avoiding scholastic dishonesty:
https://communitystandards.umn.edu/avoid-violations/avoiding-scholastic-dishonesty
Scholastic Dishonesty is discussed under CSE's scholastic policies and is defined in the University Student Conduct Code as follows:

"Scholastic Dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis."

In addition, as noted on pp. 3 and 13, the policy in general chemistry classes is that **programmable or graphing** calculators may **not** be used on exams. Use of an unacceptable calculator would be considered scholastic dishonesty, even if it were not actually programmed.

Academic dishonesty in any portion of the academic work for a course may be grounds for assigning the student a grade of F (or N) for the entire course.

4. Use of personal electronic devices: https://policy.umn.edu/education/studentresp

5. Respecting Intellectual property: "Students may not distribute instructor-provided notes or other course materials, except to other members of the same class or with the express (written) consent of the instructor. Instructors have the right to impose additional restrictions on course materials in accordance with copyright and intellectual property law and policy. Students may not engage in the widespread distribution or sale of transcript-like notes or notes that are close to verbatim records of a lecture or presentation."

Additional Links to Recommended U of M Syllabus Policy Statements (continued):

6. Grading: (also see pp. 13-14 and 17 of this syllabus)
http://policy.umn.edu/education/gradingtranscripts

7. Makeup work for legitimate absences: (also see p. 14 of this syllabus for excused absences) http://policy.umn.edu/education/makeupwork

8. Access and disability accommodations (also see p. 17 of this syllabus)
https://disability.umn.edu/ https://disability.umn.edu/student-access

9. Student mental health and stress management:
To learn more about the range of confidential mental health services available on campus, see:
https://mentalhealth.umn.edu/ https://usgumn.com/mental-health-resources

10. Safe Campus resources: https://safe-campus.umn.edu/personal-wellbeing

11. Sexual harassment and related topics: The Chemistry Department strives to provide a safe and positive environment for everyone. Policies regarding sexual harassment and related topics can be reviewed here: https://policy.umn.edu/hr/sexharassassault

The Aurora Center is also a source of support and help: http://aurora.umn.edu

12. Diversity, equity, inclusion: We welcome people of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, sexual orientations, national origins, religious affiliations, abilities, and other visible and invisible differences. Instructors, teaching assistants, and students are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. This is in agreement with university policy:
http://regents.umn.edu/sites/regents.umn.edu/files/policies/Equity_Diversity_EO_AA.pdf

Department of Chemistry Diversity, Equity and Inclusion (DEI) Committee:
For more information about our departmental efforts and upcoming activities, see
https://cse.umn.edu/chem/diversity-equity-inclusion

Equation Sheet for Chem 1071 and 1071H

(relevant portions of this equation sheet will be included as the last 2 pages of exams)

1 1A																	18 8A
1 H 1.00794	2 2A											13 3A	14 4A	15 5A	16 6A	17 7A	2 He 4.00260
3 Li 6.941	4 Be 9.01218											5 B 10.811	6 C 12.011	7 N 14.0067	8 O 15.9994	9 F 18.9984	10 Ne 20.1797
11 Na 22.9898	12 Mg 24.3050	Transition elements										13 Al 26.9815	14 Si 28.0855	15 P 30.9738	16 S 32.066	17 Cl 35.4527	18 Ar 39.948
		3 3B	4 4B	5 5B	6 6B	7 7B	8	9 8B	10	11 1B	12 2B						
19 K 39.0983	20 Ca 40.078	21 Sc 44.9559	22 Ti 47.88	23 V 50.9415	24 Cr 51.9961	25 Mn 54.9381	26 Fe 55.847	27 Co 58.9332	28 Ni 58.693	29 Cu 63.546	30 Zn 65.39	31 Ga 69.723	32 Ge 72.61	33 As 74.9216	34 Se 78.96	35 Br 79.904	36 Kr 83.80
37 Rb 85.4678	38 Sr 87.62	39 Y 88.9059	40 Zr 91.224	41 Nb 92.9064	42 Mo 95.94	43 Tc (98)	44 Ru 101.07	45 Rh 102.906	46 Pd 106.42	47 Ag 107.868	48 Cd 112.411	49 In 114.818	50 Sn 118.710	51 Sb 121.76	52 Te 127.60	53 I 126.904	54 Xe 131.29
55 Cs 132.905	56 Ba 137.327	57 *La 138.906	72 Hf 178.49	73 Ta 180.948	74 W 183.84	75 Re 186.207	76 Os 190.23	77 Ir 192.22	78 Pt 195.08	79 Au 196.967	80 Hg 200.59	81 Tl 204.383	82 Pb 207.2	83 Bi 208.980	84 Po (209)	85 At (210)	86 Rn (222)

R = 8.314 J/(mol·K) = 0.0821 (atm·L)/(mol·K)

0° C = 273.15 K

$N_A = 6.022 \times 10^{23}$ /mol

1. atm·L = 101.3 J

1. atm = 760 torr = 1.013×10^5 Pa = 14.7 lb/in^2 (psi)

density 1.00 g / mL for liquid water

1. amu (also called just "u") = 1.661×10^{-27} kg

mass of electron $m_e = 9.11 \times 10^{-31}$ kg

mass of proton $m_p = 1.67 \times 10^{-27}$ kg

Planck's constant $h = 6.63 \times 10^{-34}$ J·s

speed of light in vacuum $c = 3.00 \times 10^8$ m/s

elementary charge 1.60×10^{-19} Coulombs

Molarity (*M*) = mol solute / L solution

molality (*m*) = mol solute / kg solvent

Units:

Energy	Joule	J = kg m^2 / s^2
Force	Newton	N = kg m / s^2
Pressure	Pascal	Pa = N / m^2

SI Unit Prefixes:

kilo	10^3	e.g., 1 kg = 1×10^3 g
centi	10^{-2}	e.g., 1 cm = 1×10^{-2} m
milli	10^{-3}	e.g., 1 mL = 1×10^{-3} L
nano	10^{-9}	e.g., 1 nm = 1×10^{-9} m
pico	10^{-12}	e.g., 1 pm = 1×10^{-12} m

Angstrom (Å) 10^{-10} m

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1 m^3 = 1,000 L

1 cm^3 = 1 cc = 1 mL

Chapter 5 (Gases)

density $d = m / V$ $\quad d = P\mathcal{M} / (R\,T)$

ideal gas law $P\,V = n\,R\,T$

STP $0\ ^{\circ}C$, 1. atm standard molar volume 22.41 L

molar mass $\mathcal{M}$ (g/mol) $= m\,(g)\,R\,T / (P\,V)$

mole fraction $X_A = n_A / n_{TOTAL}$

kinetic energy: $E_K = \frac{1}{2}\ m\,u^2$ $\quad \overline{E}_K = (3/2)\,(R / N_A)\,T$

$u_{rms} = (\overline{u^2})^{1/2}$ $\quad u_{rms} = (3\,R\,T / \mathcal{M})^{1/2}$

$$\frac{\text{rate of effusion of A}}{\text{rate of effusion of B}} = (\mathcal{M}_B / \mathcal{M}_A)^{1/2} \qquad \frac{\text{rate of diffusion of A}}{\text{rate of diffusion of B}} = (\mathcal{M}_B / \mathcal{M}_A)^{1/2}$$

Chapter 6 (Thermochemistry)

work due to expansion or compression $w = -P\Delta V$

definition of enthalpy $H = E + PV$

specific heat capacity $c\ (J/g\,K) = q / (m\,\Delta T)$

$c = 4.184\ J/(g\,K)$ for liquid water

1 cal = 4.184 J

Chapter 7 (Quantum Theory)

$E_{photon} = h\,\nu = h\,c / \lambda$ $\quad \nu = c / \lambda$ $\quad (\lambda$ = wavelength of light, ν = frequency of light)

photoelectric effect $E_{photon} = h\nu = \Phi + \frac{1}{2}\ m_e u^2$ where Φ is the work function of the metal

de Broglie wavelength $\lambda = h / p = h / (m\,u)$

Hydrogen (H) atom emission lines $1 / \lambda = R_H\,(1 / n_1^2 - 1 / n_2^2)$ where $R_H = 1.097 \times 10^7\ m^{-1}$

Bohr formula for H atom energy levels $E = -2.18 \times 10^{-18}\ J / n^2$

uncertainty principle $\Delta x\ \Delta p \geq h / (4\,\pi)$ where we assume $\Delta p = m\ \Delta u$
(where p is the particle's momentum, m is its mass and u is its velocity)

Chapter 9 (Chemical Bonding)

A Few Electronegativity Values (from Fig. 9.20)

H	2.1				
Li	1.0	Na	0.9	K	0.8
Be	1.5	Mg	1.2	Ca	1.0
B	2.0	Al	1.5	Ga	1.6
C	2.5	Si	1.8	Ge	1.8
N	3.0	P	2.1	As	2.0
O	3.5	S	2.5	Se	2.4
F	4.0	Cl	3.0	Br	2.8

Chem 1071 & 1071H Schedule: MWF 9:05 - 9:55 am (Section 1)

See pp. 4 − 5 for a list of the topics to be covered in each chapter.
Below, "Chapter 5 (3)" (e.g.) refers to the 3rd class period on Chapter 5 (*not* to textbook section 5.3).
See p. 28 for a summary of the dates of Exams 1− 4, the Final Exam, and Homeworks.
The Exam and Homework dates are firm, but topics discussed on specific dates are only approximate.
In general, Exams 1 − 4 will include questions on topics covered in lectures through the previous week, Homework topics due the day of the exam or earlier, and reading and problems in the **Study Guides**.
An **Exam Review Sheet** posted the week before each exam will have a detailed list of possible topics.

	Monday	*Wednesday*	*Friday*
Chapters 1-4 Review *See **Study Guide** for selected topics and helpful videos*	***(HW "0" with 40 review problems on Chapters 1-4 is already open)***	W 9/3 Intro to Course	F 9/5 Overview of Review Topics (Chapters 1−4) ***(HW A with 20 problems on Chap. 5 opens)***
Chap. 5 *Gases and Kinetic Molecular Theory*	M 9/8 Chapter 5 (1)	W 9/10 Chapter 5 (2)	F 9/12 Chapter 5 (3) ***(HW B with 20 problems on Chap. 6 opens)***
Chap. 6 *Thermodynamics*	M 9/15 * Chapter 5 (4)	W 9/17 Chapter 6 (1)	F 9/19 Chapter 6 (2)
	M 9/22 Chapter 6 (3)	W 9/24 Catch Up & Review for Exam 1	**F 9/26 Exam 1** ***(HW C with 20 problems on Chap. 7 opens)*** ***(Homeworks 0 & A due, 40 & 20 problems on Chap. 1−4 & 5)***
Chap. 7 *Quantum & Atomic Structure*	M 9/29 Chapter 6 (4)	W 10/1 Chapter 7 (1)	F 10/3 Chapter 7 (2)
	M 10/6 Chapter 7 (3)	W 10/8 Chapter 7 (4)	F 10/10 Chapter 7 (5) ***(HW D with 20 problems on Chap. 8 opens)***
Chap. 8 *Atomic Electron Configurations*	M 10/13 Chapter 8 (1)	W 10/15 Catch Up & Review for Exam 2	**F 10/17 Exam 2** ***(Homeworks B & C due, 20 & 20 problems on Chapters 6 & 7)***

* Mon. Sept. 15, 2025 – Last day to drop a class without a "W" recorded on transcript

Chem 1071 & 1071H Schedule: MWF 9:05 - 9:55 am (Section 1), continued

	Monday	*Wednesday*	*Friday*
	M 10/20 Chapter 8 (2)	W 10/22 Chapter 8 (3)	F 10/24 Chapter 9 (1) *(HW E with 25 problems on Chap. 9 opens)*
Chapter 9 *Models of Chemical Bonding*	M 10/27 Chapter 9 (2)	W 10/29 Chapter 9 (3)	F 10/31 Chapter 10 (1) Halloween ! *(HW F with 30 problems on Chap. 10 opens)*
Chap. 10 *Molecular Shapes*	M 11/3 * Chapter 10 (2)	W 11/5 Catch Up & Review for Exam 3	**F 11/7** **Exam 3** *(Homeworks D & E due, 20 & 25 problems on Chapters 8 & 9)* *(HW G with 30 (= 15 & 15) problems on Ch. 11 & 12 opens)*
Chap. 11 *Covalent Bonds*	M 11/10 * Chapter 10 (3)	W 11/12 Chapter 11 (1)	F 11/14 Chapter 11 (2)
Chap. 12 *Liquids and Solids, Intermolecular Forces (IMFs)*	M 11/17 Chapter 11 (3)	W 11/19 Chapter 12 (1)	F 11/21 Chapter 12 (2) *(HW H with 20 (= 12 & 8) problems on Chapters 13.1 & 15 opens, due 12/10)*
Ch. 13 Section 1 *IMFs in Solutions*	M 11/24 Chapter 12 (3)	W 11/26 Chapter 13 (1)	**F 11/28** **Thanksgiving Break** ☺
Chap. 15 *Intro to Organic Compounds*	M 12/1 Chapter 15 (1)	W 12/3 Catch up & Review for Exam 4	**F 12/5** **Exam 4** *(Homeworks F & G due, 30 problems on Ch. 10 + 30 on Ch. 11 & 12)*
	M 12/8 Catch Up & Review for Final Exam	W 12/10 *Last Class* *(Homework H due, 20 problems on Chap. 13.1, 15)*	***Final Exam for MWF Class*** ***Monday Dec. 15*** ***10:30 am – 12:30 pm*** ***on Chapters 5 – 12 and selected sections of Ch. 1 – 4, 13, & 15***

* Sun. Nov. 2, 2025 – Daylight savings time ends (2 am becomes 1 am, giving an extra hour of sleep!)
* Mon. Nov. 3, 2025 – Earliest day can withdraw from Chem 1071 and remain in lab (Chem 1065)
* Mon. Nov. 10, 2025 – Last day to drop a class without college approval (W will appear on transcript)

Chem 1071 & 1071H Schedule: TTh 11:15 am - 12:30 pm (Section 2)

See pp. 4 − 5 for a list of the topics to be covered in each chapter.
Below, "Chapter 5 (3)" (e.g.) refers to the 3rd class period on Chapter 5 (*not* to textbook section 5.3).
See p. 28 for a summary of the dates of Exams 1− 4, the Final Exam, and Homeworks.
The Exam and Homework dates are firm, but topics discussed on specific dates are only approximate.
In general, Exams 1 − 4 will include questions on topics covered in lectures through the previous week, Homework topics due the day after the exam or earlier, and reading and problems in the **Study Guides**.
An **Exam Review Sheet** posted the week before each exam will have a detailed list of possible topics.

	Tues. & Thurs. *Lectures*	*Thursday* *Exams*	*Fridays* *ALEKS Homework*
Chapters 1-4 Review *See **Study Guide** for selected topics and helpful videos*	9/2 Intro to Course, 9/4 Overview of Review Topics (Chapters 1− 4)		F 9/5 ***(HW A with 20 problems on Chapter 5 opens)*** ***(HW "0" with 40 review problems on Chapters 1-4 is already open)***
Chap. 5 *Gases and Kinetic Molecular Theory*	T 9/9, Th 9/11 Chapter 5		F 9/12 ***(HW B with 20 problems on Chapter 6 opens)***
Chap. 6 *Thermodynamics*	T 9/16 * Chapter 5 Th 9/18 Chapter 6		F 9/19
	T 9/23 Chapter 6, Catch up & Review for Exam 1	**Thurs. 9/25** **Exam 1**	**F 9/26** ***Homeworks 0 & A due, 40 & 20 problems on Chapters 1−4 & 5*** ***(HW C with 20 problems on Chapter 7 opens)***
Chap. 7 *Quantum & Atomic Structure*	T 9/30 Chapter 6 Th 10/2 Chapter 7		F 10/3
	T 10/7 & Th 10/9 Chapter 7		F 10/10 ***(HW D with 20 problems on Chap. 8 opens)***
Chap. 8 *Atomic Electron Configurations*	T 10/14 Chapter 8 Catch Up & Review for Exam 2	**Thurs. 10/16** **Exam 2**	**F 10/17** ***Homeworks B & C due, 20 & 20 problems on Chapters 6 & 7)***

* Mon. Sept. 15, 2025 – Last day to drop a class without a "W" recorded on transcript

Chem 1071 & 1071H Schedule: T Th 11:15 am - 12:30 pm (Section 2), continued

	Tues. & Thurs. Lectures	*Thursday Exams*	*Fridays ALEKS Homework*
	T 10/21, Th 10/23 Chapter 8		F 10/24 *(HW E with 25 problems on Chapter 9 opens)*
Chapter 9 *Models of Chemical Bonding*	T 10/28, Th 10/30 Chapter 9		F 10/31 *(HW F with 30 problems on Chapter 10 opens)* Halloween !
Chap. 10 *Molecular Shapes*	T 11/4 * Chapter 10 Catch Up & Review for Exam 3	**Thurs. 11/6** **Exam 3**	**F 11/7** ***Homeworks D & E due, 20 & 25 problems on Chapters 8 & 9*** ***(HW G with 30 (= 15 & 15) problems on Chapters 11 & 12 opens)***
Chap. 11 *Covalent Bonds*	T 11/11 * Chap. 10 Th 11/13 Chap. 11		F 11/14
Chap. 12 *Liquids and Solids, Intermolecular Forces (IMFs)*	T 11/18 Chap. 11 Th 11/20 Chap. 12		F 11/21 ***(HW H with 20 (12 & 8) problems on Chapters 13.1 & 15 opens, due Wed. 12/10)***
	T 11/25 Chapter 12	**Thurs. 11/27** **Thanksgiving** 	**F 11/28** **Thanksgiving Break**
Ch. 13 Section 1 *IMFs in Solutions* **Chap. 15** *Intro to Organic Compounds*	T 12/2 Chapter 13.1 Chapter 15	**Thurs. 12/4** **Exam 4**	**F 12/5** ***Homeworks F & G due, 30 problems on Ch. 10 and 30 problems on Ch. 11 & 12***
	T 12/9 (our last class) Chapter 15 Catch Up & Review for Final	**Wed. 12/10** (last day of classes) ***Homework H due, 12 problems on Chap. 13.1, 8 on Chapter 15***	***Final Exam for T/Th Class*** ***Saturday Dec. 13*** ***1:30 – 3:30 pm*** ***on Chapters 5 – 12 and selected sections of Ch. 1 – 4, 13, & 15***

* Sun. Nov. 2, 2025 – Daylight savings time ends (2 am becomes 1 am, giving an extra hour of sleep!)
* Mon. Nov. 3, 2025 – Earliest day can withdraw from Chem 1071 and remain in lab (Chem 1065)
* Mon. Nov. 10, 2025 – Last day to drop a class without college approval (W will appear on transcript)

Summary of Exam Dates, Homework Dates, and Honors Project Meetings

Midterm and Final Exam Days/Times:

- **For the MWF 9:05 am Chem 1071 and 1071H classes (Sections 1):**
  - **4 Midterms** **Fridays at 9:05 – 9:55 am:** **Sept. 26, Oct. 17, Nov. 7, Dec. 5**
    in Bruininks 230 and Bruininks 412
  - **Final Exam** **Mon. Dec. 15 at 10:30 am – 12:30 pm**
    Final Exam rooms to be announced (probably Bruininks 230 + a 2nd room)

- **For the T/Th 11:15 am Chem 1071 and 1071H classes (Sections 2):**
  - **4 Midterms** **Thursdays at 11:15 am (ends 50 min. after start of exam)**:
    Sept. 25, Oct. 16, Nov. 6, Dec. 4
    in Smith 100 and Anderson 210
  - **Final Exam** **Sat. Dec. 13 at 1:30 – 3:30 pm**
    Final Exam rooms to be announced (probably Smith 100 and a 2nd room)

Online Homework Assignments: See pp. 8 –9 for more information on the ALEKS Homeworks.
Homework assignments and are due by 11:59 pm on Fridays (except H which is due Wed. 12/10)
The Homeworks 0 – G due dates are each followed by a 1-week late submission period.

Weeks	HW	Opens	Due	# ?s	Points	Chapters
1–4	**0**	Aug. 21	**Sept. 26**	40	2.0	Chap. 1-4 (selected topics only; see Study Guide)
1–4	**A**	Sept. 5	**Sept. 26**	20	2.0	Chap. 5
2–7	**B**	Sept. 12	**Oct. 17**	20	2.0	Chap. 6
4–7	**C**	Sept. 26	**Oct. 17**	20	2.0	Chap. 7
6–10	**D**	Oct. 10	**Nov. 7**	20	2.0	Chap. 8
8–10	**E**	Oct. 24	**Nov. 7**	25	2.5	Chap. 9
9–14	**F**	Oct. 31	**Dec. 5**	30	3.0	Chap. 10
10–14	**G**	Nov. 7	**Dec. 5**	30	3.0	Chap. 11, 12
12–15	**H**	Nov. 21	**Dec. 10**	20	2.0	Chap. 13.1, 15 (selected topics only)
				225	20.5	

Chem 1071H Honors Project Meetings (both Sections 1 and 2)

- **7 meetings** **Fridays at 4:00 – 5:00** on the following (non-Nova) afternoons:
  Sept. 12, Sept. 26, Oct. 10, Oct. 24, Oct. 31, Nov. 14, Dec. 5
  The Sept. 12 meeting will be in Bruininks 230 and the others in Smith 100.

More times for Honors Project presentations will be scheduled for Nov. & Dec., as needed.