



General Chemistry I

The University of Toledo
Department of Chemistry and Biochemistry
CHEM1230, CRN 24168, Section 13

Instructor: Amy Toole

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Office Hours: MTWF 11-12; W 4-5 PM; and by appointment. Talking to students is the best part of my job!

Office Location: Remote through Blackboard – [Course Room](#)

Instructor Phone: 419-530-1503

Offered: Spring 2021

Course Website: [Blackboard Learn](#)

Class Location: Remote through Blackboard – [Classroom & Office](#)

Class Day/Time: MWF 2:30-3:25

Recitation Location: Varies (see your schedule)

Recitation Day/Time: Tuesday (see your schedule)

Credit Hours: 4

CATALOG/COURSE DESCRIPTION

An introduction to atomic structure, chemical bonding, kinetic-molecular theory, energy relationships and structural concepts. This sequence is for students who major in science, engineering or other fields which require chemistry as a prerequisite subject. Three hours lecture and one-hour discussion (recitation) per week.

COURSE OVERVIEW

CHEM 1230 General Chemistry I and CHEM 1240 General Chemistry II are the lecture courses in the general chemistry sequence. The parallel lab courses are CHEM 1280 and CHEM 1290, which you may be taking with the lecture. General Chemistry is appropriate for students who are majoring in the natural sciences, science education, pharmacy, engineering and some allied health fields. Chemistry is sometimes called the “central science” because application of chemical principles is key to understanding many other sciences. In CHEM 1230 you will study the atomic level structure of matter and how this structure determines the physical properties and reactions of substances. You will become familiar with the language and symbolism of chemistry as well as sharpen your critical thinking and problem-solving abilities.

STUDENT LEARNING OUTCOMES

At the conclusion of the course students will be able to:

1. Demonstrate the use of equations and dimensional analysis to solve problems in chemistry and justify the number of significant figures in the result.
2. Explain the underlying principles for their calculations.
3. Explain fundamental chemical terms and concepts.
4. Convert between atomic level representations, symbols and names of atoms, isotopes, ions and molecules (including Lewis structures and geometric descriptions).
5. Describe the modern model of the atom and explain how it compares to earlier models.
6. Describe and compare bonding in different types of substances.
7. Identify and describe intermolecular forces in given substances, then predict relative physical properties based on intermolecular forces.
8. Qualitatively and quantitatively describe the behavior of real and ideal gases.
9. Describe the interconnectedness between periodic trends, atomic properties and element reactivity.
10. Predict, complete and balance reactions (double replacement, combustion and single replacement).

11. Describe and calculate work, enthalpy and internal energy changes in reactions and phase changes.
12. Identify and describe societal applications of chemistry.

PREREQUISITES AND COREQUISITES

Because your success in CHEM 1230 is important to me and the other General Chemistry instructors, we require that you meet one of these course prerequisites:

- A score of 50% or higher on the ALEKS chemistry placement exam (earned on the *initial* assessment or after learning in ALEKS and a subsequent assessment), **OR**
- A grade of C or above in CHEM 1090.

If your ALEKS *initial* assessment is below 50% you are required to take CHEM 1200 with CHEM 1230. If your grade in CHEM 1090 was below a B, you are strongly encouraged to take CHEM 1200 with CHEM 1230. Taking CHEM 1200 with CHEM 1230 can benefit ALL students – especially this semester, when connecting with other students may be more challenging.

TEXTS AND ANCILLARY MATERIALS

Required Materials:

- Access to a properly functioning computer with internet access in order to login to Blackboard (<https://blackboard.utdl.edu/webapps/login/>). If you have difficulties with properly functioning internet, let me know as soon as you can during the semester and together we can think through options for finding you better connections. Because this course is part of the inclusive access program, you have already paid for access to the following items which can be accessed directly through Blackboard:
 - An electronic copy of the textbook, *Chemistry* by Julia Burdge 5th edition
 - ALEKS practice
 - Connect quizzes
- Access to a computer with Lockdown Browser installed, and a working webcam for online exams.
 - The library has such computers which you may borrow.
 - The webcam may be built into your computer or plugged in with a USB cable.
 - This video link provides a basic understanding of LockDown Browser and the webcam feature: <https://www.respondus.com/products/lockdown-browser/student-movie.shtml>
 - Download and install LockDown Browser on your computer from this link now: <https://download.respondus.com/lockdown/download.php?id=213815819>
 - If you do not know how to meet this requirement, please contact me as soon as possible to arrange for alternate proctoring during exams.
- A non-programmable calculator. Only non-programmable calculators are allowed when you take exams in this course. Examples of non-programmable calculators include: TI-30XIIS, TI-30Xa, TI-30XS Multiview, TI-32, TI-34 II, TI-34 Multiview, TI-36, TI-36X Solar, Casio FX-77, Casio FX-260, Casio FX-65. Many of these can be purchased for about \$10. A calculator that has any of the following functions is not permitted for use on General Chemistry exams: solver, integration, differentiation, unit conversions, or a calculator that allows you to type an equation. If you are not sure whether your calculator is acceptable, contact me and ask.

Optional Materials:

- Hard copy of *Chemistry* by Julia Burdge 5th edition (a 3-ring hole-punch version is in the bookstore).
- Updated versions of plug-ins, recent software and the necessary tools to be kept free of viruses and spyware (<https://www.utoledo.edu/dl/main/downloads.html>).

ACADEMIC POLICIES

The University of Toledo maintains academic policies intended to promote fairness and equity among students. These are wide ranging and include policies on adding and dropping a course, dual degree requirements, graduation with honors, academic dishonesty, confidentiality of student records and veteran assistance to name just a few. Please use the following URL to read a comprehensive list of academic policies that may pertain to you in this class and throughout your academic journey: <http://www.utoledo.edu/policies/academic/undergraduate/>. If you have any questions after reading through the policies, let me know.

TEACHING METHODOLOGY

Students entering general chemistry are often nervous and unsure about whether they can do well. Being successful *will* require time and effort. However, if you have met the pre-requisites for this course, you belong here and are in the position to learn, grow and meet the challenge. The following are used to facilitate learning in this course.

Assignments in advance of class: Before participating in class sessions, watch the **Foundational presentation** (10-15 min) or read the relevant textbook sections. At a minimum, use these resources to help you fill in portions of the **Guided Note-Taking** sheets on which we will build in class. In doing this preparation, you cover the “easy” material (primarily definitions) on your own so that we can use class time to work on more challenging applications and problem solving.

Class sessions: Class sessions will be held through Blackboard at our scheduled class time: 2:30 - 3:25 PM (i.e., we will meet synchronously). You will be actively involved in the sessions by working through problems and calculations with my guidance, answering questions posed through a classroom polling system, writing on the white board, and chatting with your peers. A recording will be available if you cannot attend a class at the scheduled time or want to review our class session.

ALEKS practice: ALEKS is an online homework system that adapts to the different paces of learning and understanding among different students. Weekly ALEKS assignments are due every Sunday at 11:59 PM. There are two aspects to ALEKS; learning mode and assessment mode. During learning mode, you may ask questions of me, your TAs, tutors or your peers, but all answers should reflect your understanding of the material. During assessments (Knowledge Checks), you are expected to do the work on your own with only a pencil, paper and calculator. Do not look things up or get help in this mode as that will lead to future assignments that are too difficult.

Connect Quizzes: Weekly quizzes using an online system called Connect will help you evaluate how well you understand and can apply each week's content. These quizzes should be taken after you have completed all the problems from class, those assigned from within the text, and your ALEKS assignment. You will have two attempts:

- First attempt (due Sunday at 11:59 PM): Open book, but you are encouraged to do as much as you can without consulting your notes as you will not have notes available to you during exams. You may not consult others.
- Second attempt (due Tuesday at 11:59 PM): Open book, and you will have the opportunity to collaborate with peers as well as the teaching assistant in Tuesday recitation to improve your score.

Other quizzes are given on these topics: Getting Started, Practice Using Lockdown Browser, Lewis & VSPER.

Recitation sessions: Your goal in weekly recitation sessions (Tuesdays - check your schedule for time and location) will be to ask questions that further your understanding of the previous week's chemistry content. During these sessions you will work collaboratively with a smaller group of students and a graduate teaching assistant (TA). To earn points for recitation you will upload written work for the Connect Quiz questions (your thought process is ultimately more important than the correct answer), participate in discussion of those quiz questions, and analyze your own thinking and learning processes (practice *metacognition*).

Exams: On two mid-term exams and a cumulative final you will demonstrate what you have learned. See course schedule for dates and times.

You will take all exams using LockDown Browser and a webcam during our regularly scheduled class time. To take each exam you must show a photo identification card and the environment in which you are working. You are not allowed to use any outside sources for the exams. That is, you are not allowed to consult other people, the internet, your textbook, or any notes. You will, however, be given a periodic table and the values of constants and, you may use a non-programmable calculator; NOT a programmable calculator or phone.

If you cannot take an exam at the scheduled time due to an irresolvable conflict, you must provide **written documentation** to verify the conflict before the exam date and obtain my **approval before the exam**. If the documentation is approved, you will be given an opportunity to take the exam at an arranged time before the scheduled test date.

Make-up exams will not be given for any circumstance. If you unexpectedly miss a midterm exam due to illness, car accident or similar **extreme** circumstance you should inform me of your difficulty by email as soon as possible. If you do not have access to email, you should leave a message on my office phone (see contact info above). If your excuse is acceptable and verified, your final course grade will be computed with the score on the missed exam equal to the average of the other midterm exam and final. In all other circumstances a missed exam will result in a grade of 0.

Final Exam: The final exam cannot be excused.

Summary of Resources allowed on ALEKS, Connect Quizzes and Exams

Type of Assessment	Allowable resources*	NOT Allowed
ALEKS	Learning Mode: <ul style="list-style-type: none"> • collaboration with other individuals • textbook and your notes • internet sources • calculator** 	
	Assessment Mode (Knowledge Checks): <ul style="list-style-type: none"> • calculator** 	Assessment Mode (Knowledge Checks): <ul style="list-style-type: none"> • internet sources • collaboration with other individuals • textbook and your notes
Connect Quizzes	First attempt: <ul style="list-style-type: none"> • textbook and your notes • calculator** 	First attempt: <ul style="list-style-type: none"> • internet sources • collaboration with other individuals
	Second attempt: <ul style="list-style-type: none"> • collaboration with other individuals • textbook and your notes • calculator** 	Second attempt: <ul style="list-style-type: none"> • internet sources
Mid-term Exams and Final Exam	All: <ul style="list-style-type: none"> • calculator (non-programable) ** • periodic table and constants <u>provided</u> with the exam 	All: <ul style="list-style-type: none"> • internet sources • collaboration with other individuals • textbook and your notes

*In all cases, all work you submit should ultimately reflect your own thinking, understanding of the material, and effort.

** Only non-programable calculators are allowed on General Chemistry exams so I recommend you practice with the same one throughout the course.

Communication: As your instructor, I am here to help. The best way to contact me is through email and will do my best to respond to you within 24 to 48 hours (often I will do so more quickly). My office hours are given at the beginning of the syllabus. I will be online during those times for you to “drop in” but you are always welcome to make an appointment outside of those hours.

OVERVIEW OF COURSE GRADE ASSIGNMENT

Course Points: The following is the distribution of possible points in the course.

Course Aspect	Max. Points	Percentage of Total Points
ALEKS <ul style="list-style-type: none"> 50 pts on-time completion 50 pts pie completion at semester end 	100	13.4%
Quizzes <ul style="list-style-type: none"> Weekly Connect quizzes - 15 pts each (you earn the higher of two attempt scores) Getting Started quiz – 2 pts Practice Using Lockdown Browser – 2 pts Lewis + VSEPR Quiz – 6 pts <i>220 pts offered. No one can earn more than 200 pts– extra points cover technical difficulties</i> 	200	26.7%
Recitation Participation <ul style="list-style-type: none"> 4 pts each <i>56 pts offered. No one can earn more than 50 pts – extra points cover technical & other difficulties</i> 	50	6.5%
Mid-term exams - 100 points each	200	26.7%
Final exam	200	26.7%
TOTAL	750	100%

Midterm Grading: Midterm grades are assigned the 8th week of class and are used to assist students with determining their academic standing. Your midterm grade will be assigned based on your quiz average up through Week 5, and your first exam score. Letter ranges corresponding to percentages of points earned, are given under Final Grading.

Attendance is also recorded during the 8th week to meet state and federal laws regarding financial aid disbursement. Please note, if you are not attending class and completing assignments it could affect your financial aid (scholarships, grants, loans or Federal Work Study). If you decide you are not going to attend this class (or any other class you have registered for), you must formally withdraw (drop) from the course. You can do this by logging onto the myUT portal, clicking on the “Student” tab, and then under “My Toolkit” click on Register/Drop/Withdraw.

Final Grading: Below are the minimum percentages of total points needed to receive the indicated grade.

	A	93%	A-	90%	
B+	87%	B	83%	B-	80%
C+	77%	C	73%	C-	70%
D+	67%	D	63%	D-	60%

Drop, Withdrawal and Incomplete Grades: Dropped courses do not appear on your transcript. The deadline for dropping is February 2nd. You may withdraw from the course and receive a grade of W. The

deadline for withdrawal is March 26th. W's do not affect your GPA but do appear on your transcript. A student, registered for both this course and the laboratory (CHEM1280), who is intending to drop/withdraw from the lecture course by mid-semester (in first 8 weeks) must also drop/withdraw the associated lab course.

A student withdrawing from the lecture during the last weeks of allowed withdrawal (weeks 9-10) may be allowed to finish the lab course *if they have a grade of C or better in the lab and permission of the lab instructor*. In this case, the student must complete the required paperwork for the registrar and obtain the signature of the lab instructor to certify they meet the criteria for remaining in the lab.

A course grade of Incomplete is given only to those who have completed all but a small percentage of course requirements for an acceptable reason. The Incomplete must be removed before you take CHEM 1240.

UNIVERSITY POLICIES

Policy Statement on Non-Discrimination on the Basis of Disability (ADA)

The University is an equal opportunity educational institution. Please read [The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance](#).

Academic Accommodations

The University of Toledo embraces the inclusion of students with disabilities. We are committed to ensuring equal opportunity and seamless access for full participation in all courses. For students who have an accommodations memo from Student Disability Services, I invite you to correspond with me as soon as possible so that we can communicate confidentially about implementing accommodations in this course. For students who have not established affiliation with Student Disability Services and are experiencing disability access barriers or are interested in a referral to healthcare resources for a potential disability or would like information regarding eligibility for academic accommodations, please contact the Student Disability Services Office (<http://www.utoledo.edu/offices/student-disability-services/>) by calling 419.530.4981 or sending an email to StudentDisability@utoledo.edu.

Additional Policy Statements

Students can find other university policies listed by audience on the University Policy webpage (<http://www.utoledo.edu/policies/audience.html/#students>).

ACADEMIC AND SUPPORT SERVICES

The university provides a variety of academic and support services on campus to help you succeed and reach your fullest potential. Whether you need to ask a question, get help with an assignment, seek advice from a counselor, find a job or join a club, UToledo is there for you! You may contact me, or use the following resources to find the academic support or service you need:

Chemistry Department Help from Teaching Assistants: Virtual/online help will be available. The link for the Chemistry Department Help Center is <https://us.bbcollab.com/guest/80670d8c3ff9469dbb520091a0612503>

Help Center will be staffed starting January 25, MW 9-12, 1-4, 5-8; TR 9-8 and F 9-4, until the end of classes.

Tutoring through the Learning Enhancement Center located in the Carlson Library is available for all students in a variety of courses, including chemistry: <http://www.utoledo.edu/success/lec/>

CHEM 1200 – Problem Solving in General Chemistry: CHEM 1200 is a supplemental course to CHEM 1230 and I encourage you to add it to your schedule if it is not there now. It is a workshop-based, pass/no credit course designed to help you master the CHEM 1230 material. You will work in small groups under the guidance of an advanced student. It is scheduled for 1 hour 50 minutes on Thursdays.

Success Coaching: <https://www.utoledo.edu/successcoach/>

Student Affairs: <http://www.utoledo.edu/studentaffairs/>

Office of Student Advocacy: <https://www.utoledo.edu/studentaffairs/student-advocacy/> (help with the non-academic challenges)

Library: <http://www.utoledo.edu/library/>

Career Services: <http://www.utoledo.edu/success/career/>

Course scheduling assistance: the Chemistry Department Secretary, Ms. Samples can assist you with scheduling changes for chemistry courses (Room BO2022; email: pamela.samples@utoledo.edu ; phone: 419-530-2698).

SPECIAL COURSE EXPECTATIONS DURING COVID-19

This is an unprecedented time for our Rockets community at the University of Toledo. In times of challenge, such as this, we come together to support each other and help keep the more vulnerable members of our community safe during the COVID-19 pandemic. If we all do our part, we will help to minimize the spread of infection and maintain engaging face to face class environments this spring. That is why we are asking all faculty, staff and students to adhere to the special course expectations described below. Please review these policies described below.

Recitation Attendance: In order to ensure that we self-quarantine if symptomatic, students, faculty and staff must perform a daily health assessment, based on based on [CDC guidelines](#), before coming to campus each day, which includes taking your temperature. Students who are symptomatic/sick should not come to class and should contact the Main Campus Health Center at 419-530-3451. The University of Toledo has a [missed class policy](#). It is important that you understand the attendance requirements for this course. Please engage with me if you have any questions about these requirements. *Absences due to COVID-19 quarantine or isolation requirements **are** considered excused absences **from face to face classes**.* You should notify me if you are in quarantine or isolation and these absences may not require written notice.

Face Coverings: To help keep each other safe, everyone must wear face coverings while on campus, except while eating, alone in an enclosed space, or outdoors practicing social distancing. Students will not be permitted in class without a face covering. If you have a medical reason that prevents you from wearing a face covering due to a health condition deemed high-risk for COVID-19 by the Centers for Disease Control and Prevention (CDC), you should submit a request for accommodation through the Student Disability Services Office (SDS) by completing this [online application](#). You will need to provide documentation that verifies your health condition or disability and supports the need for accommodations. If you are already affiliated with SDS and would like to request additional accommodations due to the impact of COVID-19, please contact their accessibility specialist to discuss your specific needs.

Social Distancing: As further efforts to keep everyone safe, students should practice social distancing inside and outside the classroom, including when you enter and exit. Please maintain at least 6 feet of

distance between yourself and others, follow posted signage, and pay attention to the seating arrangements in the classroom. It's important that you do not remove stickers or tape from seats and/or tables, as they are there to provide guidance on the appropriate classroom capacity based on recommended social distancing between individuals. Please be conscious of your personal space and respectful of the space of others in the class.

Desks and Workspaces: An important part of keeping our classroom spaces safe involves keeping them sanitized. We ask all students to sanitize their desk and/or workspace before class begins, with the sanitizing spray and paper towels provided in the classroom.

Special Note: Although there is a rigorous and evidence-based plan for keeping each other safe during COVID-19, it's important to note that, based on the unpredictability of the virus, things can change at any time. So, please be patient and understanding as we move through the semester. If at any point you have any concerns about class, completing course work/assignments, and/or health concerns related to COVID, let me know.

Please also know that we recognize the COVID-19 situation has placed additional burdens on many of our students. If, at any point in the semester, you experience difficulties meeting your basic needs, managing your different responsibilities, or maintaining your physical or mental health, we have a variety of resources that can help. Review and utilize our [Student Success resources](#) and contact me if you have any questions.

COURSE SCHEDULE

A summary of the weekly topics and anticipated course schedule are provided below. **Note the Exam dates and that you must take these exams during your scheduled class time.** As instructor, I reserve the right to modify the schedule of topics if I believe it to be in the best interest of the class, however, Exam dates/times will NOT change.

Be Sure That Any of Potential Travel or Employment Plans Do Not Conflict with the Exam Schedule.

Week	Dates	Chapter Sections and Topics	Assignments*	SLOs
1	Jan 19-22	Welcome 1 Matter and Measurements 2 Atoms, Molecules and Ions	Guided Note-Taking ALEKS Practice Connect Quiz	1,2,3,4
2	Jan 25-29	3 Stoichiometry Ratios of Combinations	Guided Note-Taking ALEKS Practice Connect Quiz <i>Getting Started Quiz</i>	1,2,3,4,10
3	Feb 1-5	3 Stoichiometry Ratios of Combinations (cont'd) 4 Reactions in Aqueous Solution	Guided Note-Taking ALEKS Practice Connect Quiz	1,2,3,4,10,12
4	Feb 8-12	4 Reactions in Aqueous Solution (cont'd)	Guided Note-Taking ALEKS Practice Connect Quiz <i>Practice Using Lockdown Browser Quiz</i>	1,2,3,4,10,12
5	Feb 15-19 (No Class Feb 16)	4 Reactions in Aqueous Solution (cont'd) 5 Thermochemistry	Guided Note-Taking ALEKS Practice Connect Quiz	1,2,3,4,10,11,12
6	Feb 22-26	5 Thermochemistry (cont'd)	Midterm Exam 1: Wed. Feb 24 Chapters 1 to 5.3 Guided Note-Taking ALEKS Practice Connect Quiz	1,2,3,4,11,12
7	Mar 1-5	5 Thermochemistry (cont'd) 6 Quantum Theory & Electronic Structure of Atoms	Guided Note-Taking ALEKS Practice Connect Quiz	1,2,3,4,11,12
8	Mar 8-12 (No Class Mar 10)	6 Quantum Theory & Electronic Structure of Atoms (cont'd)	Guided Note-Taking ALEKS Practice Connect Quiz	3,4,5,9

* Guided-Note Taking sections should be completed before the start of each class and continued during class. ALEKS, Connect Quiz Attempt 1 and other quizzes are due every Sunday by 11:59 PM. Connect Quiz Attempt 2 is due after Tuesday recitation by 11:59 PM. See Blackboard for details.

Week	Dates	Chapter Sections and Topics	Assignments*	SLOs
9	Mar 15-19	7 Electron Configurations & The Periodic Table 8 Chemical Bonding I	Guided Note-Taking ALEKS Practice Connect Quiz	3,4,5,6,9
10	Mar 22-26	8 Chemical Bonding I (cont'd) 9 Chemical Bonding II	Guided Note-Taking ALEKS Practice Connect Quiz <i>Lewis Quiz</i>	3,4,6
11	Mar 29- Apr 2 (No Class Mar 29)	9 Chemical Bonding II (cont'd)	Guided Note-Taking ALEKS Practice Connect Quiz <i>VSEPR Quiz</i>	3,4,6
12	Apr 5-9	9 Chemical Bonding II (cont'd)	Guided Note-Taking ALEKS Practice Connect Quiz	1,2,3,4,5,9,11,12
13	Apr 12-16	11.1 Intermolecular Forces 10 Gases	Midterm Exam 2: Mon. Apr 12 Chapters 5.2 (calorimetry) to 9 Guided Note-Taking ALEKS Practice Connect Quiz	1,2,3,8
14	Apr 19-23	10 Gases (cont'd)	Guided Note-Taking ALEKS Practice Connect Quiz	3,4,7,12
15	Apr 26 -30 (No Class Apr 30)	11.6 Phase Changes 21. Environmental Chemistry	Guided Note-Taking ALEKS Practice Connect Quiz	8, 12
Finals Week	May 3-7	<p style="text-align: center;">***** Comprehensive Final Exam ***** Monday, May 3rd 2:45-4:45 PM You Must Take the Final at This Time.</p>		

* Guided-Note Taking sections should be completed before the start of each class and continued during class. ALEKS, Connect Quiz Attempt 1 and other quizzes are due every Sunday by 11:59 PM. Connect Quiz Attempt 2 is due after Tuesday recitation by 11:59 PM. See Blackboard for details.