

CHEM 1980.002 / Mathematical Introduction to General Chemistry

Instructor Information

Name: Stephanie Liu

Office Hours: T/Th 12:30 – 2:00 PM @ CHEM 272

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Course Schedule

Lecture: T/Th 11:00 AM – 12:20 PM @ SAGE 230

Course Prerequisites

TSI math compliant

Course Description

This is a one semester preparation course for General Chemistry. This course not only delivers chemical principles but also focuses on the application of mathematical skills in solving chemistry problems. It is designed for students with little or no chemistry training, or who need extra help with mathematics at the level of College Algebra and thus increases the likelihood of success in General Chemistry. We take a 'chemistry-first' approach, by introducing chemical concepts first and then apply specific mathematics skills to chemical concepts to facilitate deeper understanding, build student self-confidence, and get students engaged in the course.

Course Outcomes

At the end of the course, students will demonstrate the ability to:

1. Solve mathematical calculations with moving decimals, using exponential notation and prefixes.
2. Solving chemical calculations with correct significant figures and conversion factors.
3. Understand and explain atomic structure, and its influence on the periodic properties.
4. Name binary molecular compounds and ionic compounds.
5. Understand moles, mass and molar mass, and know how to balance chemical equations.
6. Perform stoichiometric calculation and identify limiting reactants and theoretical yield.
7. Define molarity and perform molarity calculation.
8. Set up and solve problems in unit dimensional analysis.
9. Relate a theory on molecular behavior in the gas phase to the Ideal Gas Law.
10. Define temperature, pressure, volume, and mole in Ideal Gas Law, and perform calculations using Ideal Gas Law.
11. Comprehend that chemistry topics are cross-linked.

Course Materials

1. Textbook: Calculations in Chemistry: An Introduction, ISBN: 9780393614367
2. Access to *Smartwork5* online Homework platform
Smartwork5 access for 360-day with Ebook costs \$36.95, without Ebook costs \$31.00.
3. A scientific calculator
4. Access to Canvas
5. An electronic device (smartphones, iPads, laptops, etc.) that could run iClicker APP for classroom participation.

Course Schedule (Subject to Change)

Color codes: exams-red, lectures-green, practice-blue, lecture and practice combined-purple

Week	Tue	Wed	Thur	Sat
1	Course Intro and Chap. 1 Lecture		Chap. 1 Lecture and Practice	HW1 due
2	Chap. 2 Lecture & Practice	HW2 due	Exam 1	
3	Chap. 3 Lecture		Chap. 3 Practice	HW3 due
4	Chap. 4 Lecture		Chap. 4 Practice	HW4 due
5	Exam 2		Chap. 6 Lecture (1)	
6	Chap. 6 Lecture (2)		Chap. 6 Practice	HW6 due
7	Chap. 7 Lecture		Chap. 7 Practice	HW7 due
8	Exam 3		Chap. 8 Lecture (1)	
9	Chap. 8 Lecture (2)		Chap. 8 Practice	HW8 due
10	Chap. 9 Lecture		Chap. 9 Practice	HW9 due
11	Exam 4		Chap. 10 Lecture & Practice	HW10 due
12	Chap. 11 Lecture & Practice	HW11 due	Chap. 12 Lecture & Practice	HW12 due
13	Exam 5		Chap. 16 Lecture (1)	
14	Chap. 16 Lecture (2) & Practice	HW16 due	Chap. 17 Lecture	HW17 due
15	Thanksgiving Holiday			
16	Chap. 17 Practice		Exam 6	
17	Final Exam at 10:30 AM – 12:30 PM			

Grading

Types of Assignments	Weight per Item	Number of Assignments	Dropping the lowest	Total Weight
Lecture Exams	10%	6	1	50%
Final Exam (cumulative)	25%	1	none	25%
Smartwork5 Homework	1%	13	1	12%
iClicker Participation	0.2%	17	2	3%
In-class Practice	1%	13	3	10%

How to Calculate Your Overall Grade

Your overall grade is a weighted average of the percentage you get on each assignment. When you multiply the percentage you get on an item by the weight of the item, the result is the percentage points you get on this item. When you sum up the percentage points you get on each item, it is the overall percentage you get on this course.

For example, if Michael received 100%, 90%, 95%, 85%, 90% and 80% on the six lecture exams respectively and each lecture exam weighed 10% of the overall grade, then after dropping the lowest lecture exam (80% on Exam 6), the total percentage points Michael got in lecture exams would be calculated as follows.

$$100\% * 10\% + 90\% * 10\% + 95\% * 10\% + 85\% * 10\% + 90\% * 10\% = 46\%$$

The total weight of all lecture exams is 50% and Michael received 46% out of 50%. In the same way is the percentage points Michael received in all the other types of assignments calculated. Then the overall percentage is the sum of the percentage points Michael received in each type of assignment.

Grading Scale

900 - 1000	=	A
800 - 899	=	B
700 - 799	=	C
600 - 699	=	D
< 600	=	F

Please note, the passing grade of the course is B.

I include two decimal places in the percentage number when I assign letter grades and look for a natural break when I decide on the cut-off value. In the following series of numbers - 90.00, 89.99, 89.89, 89.79, 89.49, 89.39, 89.29 - the natural break is at 89.79/89.49. Hence, in this example 89.79 and above gets an A. Note that these numbers are just given as an example. It does **NOT** mean that the cut off value between A and B for this semester is 89.79. To be fair to everyone, I won't reply to email requests to bump up grades.

Grading Policy on Each Type of Assignment

How to excuse an absence

Excusable absence includes [recognized religious holy days](#), participation in official university functions such as student athlete events, pregnancy and parenting, required military service, and medical or other emergency.

Excused absence at lectures or exams are only granted if it is an **excusable absence** as described above and with **written proof**. You do not need to request extensions on submitting any assignments because there is no late penalty when you submit an assignment after the due date.

Absences at lectures or exams because you forgot about it, remembered the wrong date, overslept, were too tired or too busy to take it **cannot** be excused.

Lecture Exams

Lecture exams cap at 50% of your overall grade. The lowest out of the six lecture exams will be dropped. Make-up exams are only granted for excusable absences with written proof. If you missed an exam because you forgot about it, remembered the wrong date, overslept, or was too tired to take it, make-up exams will not be given. Everyone drops the lowest lecture exam, and this can be your dropped lecture exam.

Final Exam

The final exam is cumulative and weighs up to 25% of your overall grade. The final exam **CANNOT** be dropped. There is **NO** make-up exam for the final.

Exams	Scope	Date	Location	# of questions	Time allowed
Exam 1	Chap. 1-2	8/28 Thur. 11:00 AM – 12:00 PM	Sage 230	20	60 mins
Exam 2	Chap. 3-4	9/16 Tue. 11:00 AM – 12:00 PM	Sage 230	20	60 mins
Exam 3	Chap. 6-7	10/07 Tue. 11:00 AM – 12:00 PM	Sage 230	20	60 mins
Exam 4	Chap. 8-9	10/28 Tue. 11:00 AM – 12:00 PM	Sage 230	20	60 mins
Exam 5	Chap. 10-12	11/11 Tue. 11:00 AM – 12:00 PM	Sage 230	20	60 mins

Exam 6	Chap. 16-17	12/04 Thur. 11:00 AM – 12:00 PM	Sage 230	20	60 mins
Final Exam	Cumulative	12/09 Tue. 10:30 AM – 12:30 PM	Sage 230	50	120 mins

Smartwork5 Homework

Smartwork5 is the homework platform that is combined with the textbook. There is one homework assignment for each chapter, and the lowest one is dropped. Hence, there are 13 Smartwork5 homework assignments in total. You can access all of them through Canvas. Unlimited attempts are given and there is no time limit on any attempt. It is crucial that you keep up with the vigorous pace of the course. I set the due dates of all assignments for you to gauge if you are on schedule. However, there is **no** late penalty if you submit a quiz after the due date, because the due dates are used as a reminder for you to stay on schedule for this course.

iClicker Participation

Of the 30 class meetings, 6 are lecture exams, 11 are lectures, 7 are in-class practice sessions and 6 are lecture and practice combined sessions. During the 17 lectures, each time after I demonstrate how to apply new concepts to solve problems. I will ask students to solve a similar problem and send me answers through iClicker. Class participation is graded upon iClicker responses. Your answers do not have to be correct. As long as you submit an answer through iClicker, you get 1 point per lecture. You get either 0 or 1 point on each lecture. Everyone can have two **unexcused** absence without penalty. iClicker participation caps at 3% of the overall grade.

In-class Practice

Students are to work in groups of four on a chapter worksheet during the in-class practice sessions (the ones in purple color in course calendar on page 2). There are 13 such worksheets. Please bring them out and bring to class. When your group finishes, Dr. Liu will randomly choose a person in the group and grade the answers in his/her worksheet. Everyone in the group receives the same score. Hence, it is in your best interest to work with your group and get the most out of it. As always, during group time, you are most encouraged to raise your hand for Dr. Liu to come to your table and answer your questions!

Getting Help

Technical Assistance

Part of working in the online environment involves dealing with the inconveniences and frustration that can arise when technology breaks down or does not perform as expected. Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues.

UIT Help Desk: [UIT Student Help Desk site](http://www.unt.edu/helpdesk/index.htm) (<http://www.unt.edu/helpdesk/index.htm>)

Email: helpdesk@unt.edu

Phone: 940-565-2324

In Person: Sage Hall, Room 130

Walk-In Availability: 8am-9pm

Telephone Availability:

- Sunday: noon-midnight
- Monday-Thursday: 8am-midnight
- Friday: 8am-8pm
- Saturday: 9am-5pm

Laptop Checkout: 8am-7pm

For additional support, visit [Canvas Technical Help](#)

(<https://community.canvaslms.com/docs/DOC-10554-4212710328>)

Student Support Services

UNT provides mental health resources to students to help ensure there are numerous outlets to turn to that wholeheartedly care for and are there for students in need, regardless of the nature of an issue or its severity. Listed below are several resources on campus that can support your academic success and mental well-being:

- [Student Health and Wellness Center](https://studentaffairs.unt.edu/student-health-and-wellness-center) (<https://studentaffairs.unt.edu/student-health-and-wellness-center>)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (<https://studentaffairs.unt.edu/counseling-and-testing-services>)
- [UNT Care Team](https://studentaffairs.unt.edu/care) (<https://studentaffairs.unt.edu/care>)
- [UNT Psychiatric Services](https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry) (<https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry>)
- [Individual Counseling](https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling) (<https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling>)

Other student support services offered by UNT include

- [Registrar](https://registrar.unt.edu/registration) (<https://registrar.unt.edu/registration>)
- [Financial Aid](https://financialaid.unt.edu/) (<https://financialaid.unt.edu/>)
- [Student Legal Services](https://studentaffairs.unt.edu/student-legal-services) (<https://studentaffairs.unt.edu/student-legal-services>)
- [Career Center](https://studentaffairs.unt.edu/career-center) (<https://studentaffairs.unt.edu/career-center>)
- [Multicultural Center](https://edo.unt.edu/multicultural-center) (<https://edo.unt.edu/multicultural-center>)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (<https://studentaffairs.unt.edu/counseling-and-testing-services>)
- [Pride Alliance](https://edo.unt.edu/pridealliance) (<https://edo.unt.edu/pridealliance>)
- [UNT Food Pantry](https://deanofstudents.unt.edu/resources/food-pantry) (<https://deanofstudents.unt.edu/resources/food-pantry>)

Academic Support Services

- [Academic Resource Center](https://clear.unt.edu/canvas/student-resources) (<https://clear.unt.edu/canvas/student-resources>)

- [Academic Success Center](https://success.unt.edu/asc) (<https://success.unt.edu/asc>)
- [UNT Libraries](https://library.unt.edu/) (<https://library.unt.edu/>)
- [Writing Lab](http://writingcenter.unt.edu/) (<http://writingcenter.unt.edu/>)
- [MathLab](https://math.unt.edu/mathlab) (<https://math.unt.edu/mathlab>)

Chemistry Resources

- **Chemistry Resource Center (CRC):** It a dedicated Chemistry tutoring lab, staffed by chemistry graduate students.
- **The Computational Chemistry Instructional Laboratory (CCIL):** CCIL provides computer access to all undergraduate and graduate students enrolled in UNT chemistry courses. Computers are to be used only for chemistry related work and instruction. The CCIL is staffed by chemistry graduate students knowledgeable in the area of computational chemistry.

More information about CRC and CCIL can be found at this website

(<https://chemistry.unt.edu/undergraduate-program/instructional-resources>).

UNT POLICIES

COVID-19

If you test positive for COVID, I would like to refer you to the current CDC Guidelines (<https://www.cdc.gov/coronavirus/2019-ncov/index.html>). You will need to provide documentation of a positive test and/or medical treatment in order to meet [UNT's Student Attendance & Authorized Absence policy](#). Please visit the Dean of Students if you need assistance documenting authorized absences due to COVID or any other allowed reason.

Class Recordings & Student Likenesses

My lectures and notes are protected by state common law and federal copyright law. You are authorized to take notes in class thereby creating a derivative work from my lecture, but you are not authorized to make those notes available to anyone outside of your section. You may record my lectures, but you are not authorized to share that recoding with anyone outside of your section.

Academic Dishonesty

Students caught cheating or plagiarizing will receive a "0" for that particular assignment or exam. Additionally, the incident will be reported to the Office of Academic Integrity, who may impose further penalty. According to the UNT catalog, the term "cheating" includes, but is not limited to: (a) use of any unauthorized assistance in taking quizzes, tests, or examinations; (b) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (c) the acquisition, without permission, of tests or other academic material belonging to a faculty or staff member of the university; (d) dual submission of a paper or project, or resubmission of a paper or project to a different class without express permission from the instructor(s); or (e) any other act designed to give a student an unfair advantage. The term "plagiarism" includes,

but is not limited to: (a) the knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; and (b) the knowing or negligent unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

Acceptable Student Behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at <http://deanofstudents.unt.edu>.

ODA Statement

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time, however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the Office of Disability Access website at <http://www.unt.edu/oda>. You may also contact ODA by phone at (940) 565-4323.

Emergency Notification and Procedures

UNT uses a system called Eagle Alert to quickly notify you with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). The system sends voice messages (and text messages upon permission) to the phones of all active faculty staff, and students. Please make certain to update your phone numbers at <http://www.my.unt.edu>. Some helpful emergency preparedness actions include: 1) know the evacuation routes and severe weather shelter areas in the buildings where your classes are held, 2) determine how you will contact family and friends if phones are temporarily unavailable, and 3) identify where you will go if you need to evacuate the Denton area suddenly. In the event of a university closure, please refer to Blackboard for contingency plans for covering course materials.

Retention of Student Records

Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Course work completed via the Canvas online system, including grading information and comments, is also stored in a safe electronic environment for one year. You have a right to view your individual record; however, information about your records will not be divulged to other individuals without the proper written consent. You are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the university's policy in accordance with those mandates at the following link:

<http://essc.unt.edu/registrar/ferpa.html>