Chem 1420.005 / General Chemistry for Science Majors, 2nd semester

Instructor Contact

Name: Stephanie Liu
Pronouns: She/her/hers

Office Hours: Wed. 10 AM – 1 PM, or by appointment, in person @ CHEM 272 or @ Zoom
Email: stephanie.liu@unt.edu

Course Schedule

Lecture: T/Th 9:30 – 10:50 AM @ Sage 230, all material posted in Canvas: Chem 1420.005
Recitation: W 2:00 – 2:50 PM @ CHEM 106, all material posted in Canvas: Chem 1420.005

Due dates at a glance:

- Exam 1 on 2/08, Thur., 9:30 – 10:30 AM
- Exam 2 on 3/07, Thur., 9:30 – 10:30 AM
- Exam 3 on 4/04, Thur., 9:30 – 10:30 AM
- Exam 4 on 5/02, Thur., 9:30 – 10:30 AM
- Final Exam 5/09, Thur., 8:00 - 10:00 AM
- All of the 26 pre-lecture quizzes are due at 9:00 AM on Tue and Thur before lectures start.
- All of the 26 homework quizzes are due on Sat. of the week at 11:59 PM.
- All of the 15 recitation quizzes are due on Sat. of the week at 11:59 PM.
- All of the 14 PLTL quizzes are due on Sat. of the week at 11:59 PM.

Course Description

Chem 1420 is the second semester of general chemistry, applying the second law of thermodynamics to predict spontaneity in physical equilibria and chemical equilibria. In addition, principles in kinetics and topics in nuclear chemistry are introduced.

Course Structure

After spending the first lecture reviewing most relevant information from chem 1, I will spend 25 lectures to cover 8 chapters in chem 2. For each lecture, I provide 1 or 2 or 3 sections of reading posted in Canvas pages, 1 pre-lecture quiz (extra credit), 1 worksheet to be completed during lecture, and 1 homework quiz. In each week, I provide a recitation quiz (extra credit) and a PLTL quiz (extra credit) to review the important topics covered on Tue of the week and on Thur of the previous week. Active learning strategies will be implemented in the course, where students are expected to read the content posted in Canvas before coming to lecture. During lectures, after explaining the key concepts, I will focus on demonstrating how to apply the new concepts to solve problems.
Course Prerequisites

Grade of “C” or better in CHEM 1410 (General Chemistry I) or equivalent.

Course Corequisites

CHEM 1420.251 (recitation)

Course Objectives

Upon successful completion of this course, you will be able to (numbered in order of presentation):

1. Apply the concept of entropy and free energy to predict if a process is spontaneous.
2. Apply the principles of thermodynamics in the first chapter to predict if solution can be formed, and explain/compute colligative properties of solutions.
3. Apply the concept of spontaneity to a reversible process to predict whether and how a reversible process reaches a dynamic equilibrium.
4. Apply the principles of equilibrium to analyze the dissolution process, a physical equilibrium, to calculate solubility and explain the factors that affect solubility.
5. Apply the principles of equilibrium to analyze acid base chemistry in various complex situations.
6. Apply the concept of free energy in the context of redox reactions to explain how electrochemical cells work, reveal the relationship between cell potential and free energy change of a redox reaction, and calculate concentrations in the same approach that equilibrium problems are solved.
7. Model reaction rates as a function of concentration of reactants, time, temperature and presence of catalyst, according to collision theory.
8. Balance nuclear chemical equations and identify nuclear decay processes.

Textbook

Chemistry: Atoms First The textbook is available in web view and PDF for free. The web view is recommended when you are online, because the embedded hyperlinks work seamlessly on any device. The PDF is for you to browse when you are offline.

Course Grade Breakdown

<table>
<thead>
<tr>
<th>Assignment Groups</th>
<th>Group Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Exams (drop the lowest)</td>
<td>45%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Lecture Attendance</td>
<td>10%</td>
</tr>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Pre-lecture Quizzes</td>
<td>1%</td>
</tr>
<tr>
<td>Recitation Quizzes</td>
<td>1%</td>
</tr>
<tr>
<td>PLTL Quizzes</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>103%</td>
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</tbody>
</table>

Lecture Exams

Lecture exams weigh up to 45% of your overall grade. The lowest out of the four lecture exams will be dropped.
### Exams

<table>
<thead>
<tr>
<th>Exams</th>
<th>Scope</th>
<th>Time</th>
<th>Location</th>
<th>Number of questions</th>
<th>Time allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>Lecture 1-7</td>
<td>2/08 Thur, 9:30 – 10:30 AM</td>
<td>Sage 230</td>
<td>20</td>
<td>60 mins</td>
</tr>
<tr>
<td>Exam 2</td>
<td>Lecture 8-13</td>
<td>3/07 Thur, 9:30 – 10:30 AM</td>
<td>Sage 230</td>
<td>20</td>
<td>60 mins</td>
</tr>
<tr>
<td>Exam 3</td>
<td>Lecture 14-19</td>
<td>4/04 Thur, 9:30 – 10:30 AM</td>
<td>Sage 230</td>
<td>20</td>
<td>60 mins</td>
</tr>
<tr>
<td>Exam 4</td>
<td>Lecture 20-26</td>
<td>5/02 Thur, 9:30 – 10:30 AM</td>
<td>Sage 230</td>
<td>20</td>
<td>60 mins</td>
</tr>
<tr>
<td>ACS Final Exam</td>
<td>Lecture 1-26</td>
<td>5/09, 8:00 - 10:00 AM</td>
<td>Sage 230</td>
<td>70</td>
<td>120 mins</td>
</tr>
</tbody>
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### Final Exam

The final exam is an ACS exam. It is cumulative. The final exam CANNOT be dropped. Final exam weighs up to 25% of your overall grade.

### Pre-lecture Quizzes

Active learning strategies will be implemented in the course, where students are expected to read the material posted in Canvas before coming to lecture. A pre-lecture quiz with 1 or 2 questions is provided on the reading. All the pre-lecture quizzes are due at 9 AM before its lecture, awarded as extra credit. You have 2 attempts with no time limit on either attempt. The key is shown after the last attempt. Recitation quizzes are extra credit assignments for up to 1% of your overall grade.

### Lecture Attendance

During lectures, I will spend most of my time demonstrating how to apply the new concepts to solve problems. I will solve one problem, then ask the students to work in groups and solve a similar problem and keep alternating. Attendance in lectures weighs up to 10% in the overall grade. Merely showing up in class does not count as attendance, submitting answers through iClicker does. Your answers do not have to be correct. Attendance merits 1 point per lecture. You get either 0 or 1 point on each lecture. Please send me written proof for excused absences. Everyone can have up to 2 unexcused absences.

### Homework

One homework quiz is provided for each of the 26 lectures. Three attempts are given and there is no time limit on any attempt. Each homework is due at the end of Sat. of the week. Homework weighs up to 20% of your overall grade.

Some homework quizzes contain different questions in each attempt, while others contain the same questions in each attempt. If a homework quiz contains the same questions in each attempt. The key is revealed after
the last attempt. If a homework quiz contains different questions in each attempt. The key is revealed after each attempt.

Recitation Quizzes

Recitation quizzes are extra credit assignments for up to 1% of your overall grade. Each recitation quiz reviews the material covered on Tue of the week and Thur of the previous week. Each quiz is due at the end of the week, but a recitation session is offered in the middle of the week by PLTL leaders to answer your questions. During the recitation sessions, you are highly encouraged to work in groups and reach out to the PLTL leaders when you have questions.

You have only one attempt on each quiz. The key will only be shown 10 minutes after the quizzes are due. When you see the key, an explanation of the key is provided for some of the questions.

PLTL Quizzes

PLTL quizzes are extra credit assignments for up to 1% of your overall grade. Each PLTL quiz reviews the material covered on Tue of the week and Thur of the previous week. You have only one attempt on each quiz. The key will only be shown 10 minutes after the quizzes are due. When you see the key, an explanation of the key is provided for some of the questions.

Each quiz is due at the end of the week, but multiple PLTL sessions are offered in the middle of the week by PLTL leaders to answer your questions. The schedule of PLTL sessions will be posted on Canvas by the end of the first week. You must participate in-person. The Zoom option is provided only for the online section. During the PLTL sessions, you are to work in groups on the PLTL quiz of the week and the PLTL leaders will assist your group discussion.

Grading

- A = 90% - 100%
- B = 80% - 89%
- C = 70% - 79%
- D = 60% - 69%
- F = 0% - 59%

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. For example, in the following series of numbers, the natural break is at 89.79/89.49. Hence, in this example 89.79 and above gets an A. To be fair to everyone, I won't reply to email requests to bump up grades.

90.00, 89.99, 89.89, 89.79, 89.49, 89.39, 89.29

UNT policies

Academic Integrity Policy

Academic Integrity Standards and Consequences. According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.
ADA Policy
UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one’s specific course needs. Students may request accommodations at any time, however, ODA notices of 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 accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website (https://disability.unt.edu/).

Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)
The University of North Texas (UNT) prohibits discrimination and harassment because of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

Emergency Notification & Procedures
UNT uses a system called Eagle Alert to quickly notify students 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). In the event of a university closure, please refer to Canvas 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. Students have the right to view their individual record; however, information about student’s records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University’s policy. See UNT Policy 10.10, Records Management and Retention for additional information.

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. Visit UNT’s Code of Student Conduct (https://deanofstudents.unt.edu/conduct) to learn more.

Access to Information - Eagle Connect
Students’ access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student’s Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail Eagle Connect (https://it.unt.edu/eagleconnect).

Student Evaluation Administration Dates
Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during weeks 13, 14 and 15 of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link.
Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the SPOT website (http://spot.unt.edu/) or email spot@unt.edu.

Survivor Advocacy
UNT is committed to providing a safe learning environment free of all forms of sexual misconduct. Federal laws and UNT policies prohibit discrimination on the basis of sex as well as sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking and/or sexual assault, there are campus resources available to provide support and assistance. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-5652648.

Important Notice for F-1 Students taking Distance Education Courses

Federal Regulation
To read detailed Immigration and Customs Enforcement regulations for F-1 students taking online courses, please go to the Electronic Code of Federal Regulations website (http://www.ecfr.gov/). The specific portion concerning distance education courses is located at Title 8 CFR 214.2 Paragraph (f)(6)(i)(G).

The paragraph reads:

(G) For F-1 students enrolled in classes for credit or classroom hours, no more than the equivalent of one class or three credits per session, term, semester, trimester, or quarter may be counted toward the full course of study requirement if the class is taken on-line or through distance education and does not require the student's physical attendance for classes, examination or other purposes integral to completion of the class. An on-line or distance education course is a course that is offered principally through the use of television, audio, or computer transmission including open broadcast, closed circuit, cable, microwave, or satellite, audio conferencing, or computer conferencing. If the F-1 student's course of study is in a language study program, no on-line or distance education classes may be considered to count toward a student's full course of study requirement.

University of North Texas Compliance
To comply with immigration regulations, an F-1 visa holder within the United States may need to engage in an on-campus experiential component for this course. This component (which must be approved in advance by the instructor) can include activities such as taking an on-campus exam, participating in an on-campus lecture or lab activity, or other on-campus experience integral to the completion of this course.

If such an on-campus activity is required, it is the student’s responsibility to do the following:

(1) Submit a written request to the instructor for an on-campus experiential component within one week of the start of the course.

(2) Ensure that the activity on campus takes place and the instructor documents it in writing with a notice sent to the International Student and Scholar Services Office. ISSS has a form available that you may use for this purpose.

Because the decision may have serious immigration consequences, if an F-1 student is unsure about his or her need to participate in an on-campus experiential component for this course, s/he should contact the UNT International Student and Scholar Services Office (telephone 940-565-2195 or email internationaladvising@unt.edu) to get clarification before the one-week deadline.

Student Verification
UNT takes measures to protect the integrity of educational credentials awarded to students enrolled in distance education courses by verifying student identity, protecting student privacy, and notifying students of any special meeting times/locations or additional charges associated with student identity verification in distance education courses.

See UNT Policy 07-002 Student Identity Verification, Privacy, and Notification and Distance Education Courses (https://policy.unt.edu/policy/07-002).

Use of Student Work
A student owns the copyright for all work (e.g. software, photographs, reports, presentations, and email postings) he or she creates within a class and the University is not entitled to use any student work without the student’s permission unless all of the following criteria are met:

The work is used only once.

The work is not used in its entirety.

Use of the work does not affect any potential profits from the work.

The student is not identified.

The work is identified as student work.

If the use of the work does not meet all of the above criteria, then the University office or department using the work must obtain the student’s written permission.

Download the UNT System Permission, Waiver and Release Form

Transmission and Recording of Student Images in Electronically-Delivered Courses

No permission is needed from a student for his or her image or voice to be transmitted live via videoconference or streaming media, but all students should be informed when courses are to be conducted using either method of delivery.

In the event an instructor records student presentations, he or she must obtain permission from the student using a signed release in order to use the recording for future classes in accordance with the Use of Student-Created Work guidelines above.

Instructors who video-record their class lectures with the intention of re-using some or all of recordings for future class offerings must notify students on the course syllabus if students' images may appear on video. Instructors are also advised to provide accommodation for students who do not wish to appear in class recordings.

Example: This course employs lecture capture technology to record class sessions. Students may occasionally appear on video. The lecture recordings will be available to you for study purposes and may also be reused in future course offerings.

No notification is needed if only audio and slide capture is used or if the video only records the instructor's image. However, the instructor is encouraged to let students know the recordings will be available to them for study purposes.

Pre-recorded lectures

Pre-recorded lectures are the intellectual property of the university or instructor and are reserved for use only by students in this class and only for educational purposes. Students may not post or otherwise share the recordings outside the class, or outside the Canvas Learning Management System, in any form. Failing to follow this restriction is a violation of the UNT Code of Student Conduct and could lead to disciplinary action.