

CHEMISTRY 1423 – HONORS GENERAL CHEMISTRY LECTURE

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Office Hours: I will be available in my office from 10:00 – 11:00 on Monday, Wednesday and Friday. I am on campus most days from 8am to 5pm and will be more than happy to answer questions anytime that I am not busy with someone else.

Textbook: Chemistry: Atoms First, 5th Edition, by Julia Burdge and Jason Overby

Publisher: McGraw Hill Company, Copyright (2021)

Catalog Description

Thermodynamics, reaction rates, equilibrium, electrochemistry, organic chemistry, polymers, radioactivity and nuclear reactions.

Course Objectives

- (1) Upon successful completion of Chem. 1423, students should be able to write rate law expressions and propose reaction mechanisms based on experimental reaction data.
- (2) Upon successful completion of Chem. 1423, students should understand chemical equilibria and be able to calculate the equilibrium concentrations given the initial reactant concentrations and the equilibrium constant.
- (3) Upon successful completion of Chem. 1423, students should be able to apply the scientific method.
- (4) Upon successful completion of Chem. 1423, students should be able to calculate the pH of solutions containing strong and weak acids/bases.
- (5) Upon successful completion of Chem. 1423, students should be able to apply the laws of thermodynamics to determine whether or not a given reaction will be spontaneous under the given set of experimental conditions.
- (6) Upon successful completion of Chem. 1423, students should be able to solve problems related to electrochemistry.

Student Learning Objectives: General Chemistry

1. Students will be able to determine the order of a chemical reaction and calculate the rate constant from initial rate data.
2. Students will be able to perform equilibrium constant calculations for chemical reactions involving gases and for chemical reactions occurring in solution.
3. Students will be able to write reaction mechanisms consistent with the rate law expression.
4. Students will be able to construct pH titration curves for the titration of both monoprotic and polyprotic weak acids.
5. Students will be able to calculate the pH of solutions containing weak acids, weak bases, salts of weak acids.
6. Students will be able to balance oxidation-reduction equations using both the method of half-reactions and method of oxidation numbers.
7. Students will be able to solve basic stoichiometry problems involving acid-base chemical

reactions. Students will be able to determine oxidation numbers of atoms in common compounds.

- 8. Students will be able to apply Le Chatelier's Principle to chemical systems at equilibrium.
- 9. Students will be able to calculate molar and molal concentrations of chemicals in various solutions and mixtures, and to work stoichiometric problems using afore-mentioned concentrations.
- 10. Students will be able to solve thermochemical problems.
- 11. Students will be able to calculate the equilibrium constant based on thermodynamic data.
- 12. Students will be able to apply the laws of thermodynamics to determine whether or a chemical reaction is spontaneous under the given set of experimental conditions.
- 13. Students will be able to calculate the molar mass of an unknown substance based on the colligative properties.
- 14. Students will be able to compute the potential of an electrochemical cell using standard reduction potentials.
- 15. Students will be able to solve numerical problems pertaining to the solubility of ionic salts in water.

TENTATIVE SCHEDULE

WEEK OF:	CHAPTERS TO BE COVERED
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January 12	Begin Chapter 13: Physical Properties of Solution
January 19	No Class on Monday – Finish Chapter 13: Physical Properties of Solution January 29
January 26	Chapter 14 Chemical Kinetics
February 2	Chapter 14: Chemical Kinetics Exam 1 over Chapters 13 and 14 on Thursday
February 9	Chapter 15: Entropy and Gibbs Energy
February 16	Finish Chapter 15 Chapter 16: Chemical Equilibria
February 23	Finish Chapter 16: Exam 2 over Chapter 15 and 16 on Thursday
March 2	Chapter 17: Acid, Bases and Salts
March 9	Spring Break – No Class
March 16	Finish Chapter 17: Acids, Bases and Salts Begin Chapter 18: Acid-Base Equilibria and Solubility Equilibria

March 23	Continue Chapter 18: Acid-Base Equilibria and Solubility Equilibria Exam 3 on Chapter 17 and Chapter 18 (as much as was covered) on Thursday
March 30	Finish Chapter 18: Begin Chapter 19: Electrochemistry
April 6	Continue Chapter 19: Electrochemistry
April 13	Finish Chapter 19: Electrochemistry Begin Chapter 20 Nuclear Chemistry
April 20	Continue Chapter 20: Nuclear Chemistry Exam 4 over Chapters 18, 19 and 20 (as much as was covered) on Thursday
April 27	Pre-Finals Week – Review for Final Exam

Final Exam: **The final exam in the course is scheduled for:**

**CHEM 1423.001 (T, Th) for Tuesday May 5th,
from 10:00-12:00**

as listed online in the Spring 2026 Schedule of Final Exams. Be sure to check the examination schedule to make sure there are no typographical errors.

GRADING POLICY:

Your grade will be determined entirely by your performance on the regular 100-point examinations and a 200-point comprehensive final exam. **There will be no extra credit assignments, reports, papers, etc.** You will be allowed to drop the lowest of the four 100-point examinations. **Examination scores of zero that result from cheating cannot be dropped.**

Should you miss one or more of the 100-point examinations for an excused absence, you will be allowed to take a make-up examination. The excused absences that are listed in UNT Policy 06.039 Student Attendance and Authorized Absences are:

- a. religious holy day, including travel for that purpose;
- b. participation in an official university function;
- c. required military service, including travel for that purpose;

- d. pregnancy and parenting under Title IX; and
- e. when the University is officially closed.

Please note that the student is responsible for requesting in a reasonable time an excused absence in writing, providing satisfactory evidence to the faculty member to substantiate excused absence, and delivering the request personally to the faculty member assigned to the course for which the student will be absent.

If you miss an examination because of an un-excused absence, you will receive a grade of zero for the missed examination. Remember that you are allowed to drop the lowest examination score and the missed examination for an un-excused absence can then serve as your one dropped examination. **The 200-point comprehensive final exam grade will not be dropped.**

Should you have a question concerning the way that your examination was graded, or if you think that there was an error in calculating the exam score, then it is your responsibility to bring the matter to the attention of the Instructor in timely fashion. Except for the last 100-point exam, students have two weeks from when the examination was passed back to the class to bring up grading errors or other such concerns. On the last 100-point examination students have until the day of their Final Examination to bring up grading concerns. It is your responsibility to check your examination for grading errors, and to make sure that the score was correctly calculated.

Grades will be based upon the best three of four 100-point regular examinations and the 200-point comprehensive final examination. Points will be assigned as follows:

Best three 100-point regular examinations	300 Points
200-Point Comprehensive final examination	200 Points

Letter grades will be based upon the following grading scale:

90 – 100 % of the total points	450 – 500 Points	Grade = A
80 – 89 % of the total points	400 – 449 Points	Grade = B
70 – 79 % of the total points	350 – 399 Points	Grade = C
60 – 69 % of the total points	300 – 349 Points	Grade = D
Below 60 %	0 – 299 Points	Grade = F

The University does have very strict rules concerning “Incomplete” grade. The incomplete grade is given only during the last one-fourth of a term/semester, and only if a student: (1) gives notice to the instructor of being required to participate in active military service; or (2) is passing the course and has justifiable reason why the work cannot be completed on schedule. Grades of incomplete are not to be used as a substitute for “F”. The rules governing “Incomplete” are explained in greater detail in the UNT Undergraduate Catalog.

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 accommodation 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.

TEST POLICY

It is important to show up on time for the examination. The only time that one has to work the examination is the allotted class time. Cell phones, cell phone calculators and devices that connect to the internet are not to be used during the examination.

Academic dishonesty and cheating will not be tolerated. The term "cheating" includes, but is not limited to:

- (a) Use of any unauthorized assistance taking quizzes, tests or examinations.
- (b) Acquisition, without permission, of tests, notes or other academic belonging to a faculty member or staff member of the University:
- (c) Any other act designed to give a student an unfair advantage

The UNT Academic Integrity policy is available in pdf format at the following website:

<https://policy.unt.edu/policy/06-003>

Academic dishonesty and cheating are not appropriate, are grounds for dismissal from the course with an "F" and will be referred to the appropriate University official. Cheating on an

exam will result in either: (a) a score of zero on the exam (this exam cannot be dropped); or (b) dismissal from the course with an “F”.

DISRUPTION OF CLASS

Disruption of classes is forbidden by the Student Code of Conduct and will result in dismissal of the student from the classroom. Disruption of classes includes, but is not limited to, horseplay, chatting socially, noisy or other offensive behavior that is disturbing to fellow classmates, and operation of cell phones.

ATTENDANCE POLICY

Students are expected to attend classes regularly and to abide by the attendance policy established for each class. Students are responsible for the material that is covered in the class lecture and during the recitation. Should a student miss a lecture or recitation class, it is the student’s responsibility to get the lecture notes from other students.

CANCELLATION OF CLASSES BY THE UNIVERSITY

During the Spring semester the University is sometimes closed due to bad weather. Should the University be closed during an examination day, then the examination will likely be given on either the first- or second-class day that we are back after the University was closed.

Suggested Homework Problems

Chapter 13: 13, 16-21, 28, 30-33, 36, 51, 54, 56-61, 65-71, 75, 83-85, 95, 98, 102, 111, 129, 137

Chapter 14: 1-3, 8-11, 16, 18-25, 26, 31, 32, 38, 42-48, 55, 56, 63, 64, 71-74, 80, 84, 86, 90, 101, 102, 107-109, 113, 127

Chapter 15: 3, 8, 9, 12-15, 20, 21, 29-35, 41-44, 49, 50, 53, 59, 61, 67

Chapter 16: 6-12, 15-18, 23, 24, 27-29, 33-37, 42, 44-51, 57, 59-63, 65-75, 79, 86, 89, 103-105, 108, 116, 149

Chapter 17: 2, 3, 14-31, 34-37, 48-55, 57-61, 64, 65, 69-74, 82-85, 94-97, 112, 114-116, 125, 126, 130, 133, 134

Chapter 18: 9-16, 17-20, 27-34, 39, 40, 49-55, 61-69, 76, 89-91, 97, 98, 101, 102, 115, 118

Chapter 19: 1, 2, 10-15, 21-25, 30-34, 42-54, 57, 65-71, 79, 81, 88, 89, 93-5, 113, 115

Chapter 20: 5, 6, 14-18, 21-29, 34-37, 52, 65, 66, 77, 92, 93