General Chemistry I for Science Majors (CHEM 1410.007)

Instructor: Aida Yahagh ([AidaYahagh@my.unt.edu](mailto:AidaYahagh@my.unt.edu))

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| **Session** | **Days** | **Time** | **Location** |
| CHEM 1410.007 (in-person) | Tu/Th | 11:00 am – 12:20 pm | LIFE A 106 |
| CHEM 1410.207 (in-person) | Tu | 2:00 pm – 2:50 pm | LIFE A 106 |
| Office Hour  (other time by appointment) |  | | |
| Tu/Th | 1:00 pm – 2:00 pm | CHEM 361 |

**Pre-requisite**: MATH 1100 or equivalent.

**Co-requisite**: CHEM 1410.207 (recitation)

Ideally, students will also enroll in CHEM 1430 (laboratory)

**Course Description**: This course is the first semester of the two-semester General Chemistry sequence. The goal is to provide students with a solid knowledge of the basic concepts in general chemistry. The course focuses on the following: the structure of atoms, the nature of bonding, the composition and properties of compounds, chemical reactions, thermochemistry; the mole concept and its applications, and the properties of solids, liquids and gases. Basic problem solving skills and critical thinking are emphasized.

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

1. describe the basic relationships between electronic structure of atoms and the formation of chemical bonds between atoms in molecules.
2. describe how chemical bonds in molecules determine chemical behavior in such important areas as energy, the environment, and biology.
3. use periodic trends and chemical composition to predict physical properties.
4. understand the relationships between atomic structure and trends in chemical properties across the periodic table.
5. balance chemical reactions and describe the commonly encountered reaction types.
6. understand and apply fundamental concepts in thermodynamics (ie: enthalpy) to predict certain aspects of chemical behavior.
7. describe chemical reactions in terms of the amount of product and the associated energy change.
8. relate a theory on molecular behavior in the gas phase to the Ideal Gas Law.
9. interpret mathematical equations to make predictions on the relationships among variables

# Course Materials

1. Textbook: Chemistry: Atoms First, 2nd Ed., Openstax,

<https://openstax.org/details/books/chemistry-atoms-first-2e>

1. A scientific non-graphing calculator
2. Canvas is your single log-on to access lecture notes, assignments, grades.
   * Canvas technical assistance: UNT Help Desk <http://www.unt.edu/helpdesk/index.htm> [Email: helpdesk@unt.edu](mailto:Email:%20helpdesk@unt.edu) Phone: 940.565-2324
3. An electronic device (phone, iPad, computer, etc.) that could run iClicker app for classroom responses

**Course Schedule** (Subject to Change)

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Day** | **Date** | **Topic** |
| **1** | Tu/Th | Aug 19, 21 | Chapter 1: Measurement and dimensional analysis |
| Tu | Aug 19 |  |
| **2** | Tu/Th | Aug 26, 28 | Chapter 2: Atomic structure; Chapter 3: Energy and waves |
| Tu | Aug 26 | Recitation #1 |
| **3** | Tu/Th | Sept 2, 4 | Chapter 3: Bohr’s theory, quantum numbers and orbitals |
| Tu | Sept 2 | Recitation #2 |
| **4** | Tu/Th | Sept 9, 11 | Chapter 3: Electron configuration and periodic trends |
| Tu | Sept 9 | ***Exam 1: Chapters 1 ~ 3 (part of Chapter 3)*** |
| **5** | Tu/Th | Sept 16, 18 | Chapter 3: Ions and compounds |
| Tu | Sept 16 | Recitation #3 |
| **6** | Tu/Th | Sept 23 and 25 | Chapter 4: Chemical bonds, octet rule and Lewis structure |
| Tu | Sept 23 | Recitation #4 |
| **7** | Tu/Th | Sept 30, Oct 2 | Chapter 4: Resonance and geometry |
| Tu | Sept 30 | Recitation #5 |
| **8** | Tu/Th | Oct 7, 9 | Chapter 4: Polarity; Chapter 5: valence bond theory and hybridization |
| Tu | Oct 7 | ***Exam 2: Chapters 3 ~ 4*** |
| **9** | Tu/Th | Oct 14, 16 | Chapter 6: Composition of compounds, solution and molarity |
| Tu | Oct 14 | Recitation #6 |
| **10** | Tu/Th | Oct 21, 23 | Chapter 6: Concentration; Chapter 7: Balancing equations, aqueous chemical reactions |
| Tu | Oct 21 | Recitation #7 |
| **11** | Tu/Th | Oct 28, 30 | Chapter 7: Limiting reactants and quantitative analysis |
| Tu | Oct 28 | ***Exam 3: Chapters 5 ~ 7 (part of Chapter 7)*** |
| **12** | Tu/Th | Nov 4, 6 | Chapter 8: Ideal gas, gas mixture and KMT |
| Tu | Nov 4 | Recitation #8 |
| **13** | Tu/Th | Nov 11, 13 | Chapter 8: Gas mixtures; Chapter 9: Energy |
| Tu | Nov 11 | Recitation #9 |
| **14** | Tu/Th | Nov 18, 20 | Chapter 9: Enthalpy |
| Tu | Nov 18 | ***Exam 4: Chapters 7 ~ 9 (part of Chapter 9)*** |
| ***No Classes or Recitations, Thanksgiving Holiday!*** | | | |
| **15** | Tu/Th | Dec 2 and 4 | Chapter 9: Bond energies; |
| Tu | Dec 2 | Recitation #10 |

\*Class dates for topics are tentative and may change without notice. Any change in Exam dates will be announced in class and posted on the course website.

**Grading**

Your grade is determined by your performance in seven categories. **Questions about any posted score must be submitted within seven days of the posted score; questions submitted afterwards may be declined.**

***Four In-Term Exams 400 points***

There are four 50-minute in-term exams held during recitation sessions on the dates specified on Page 2. Each exam has 100 possible points. Your average will be calculated after dropping the lowest in-term exam score. If a student receives a “0” because of cheating, that grade cannot be used as the dropped grade.

**No Make‐up exams will be given**. If you have an acceptable, documented reason for missing an exam (examples include documented illness, auto accident, participation in UNT-sponsored event, observance of religious holiday), we can discuss alternatives. You need to bring the document to me within 3 days after the exam.

***Final Exam 200 points***

Your final exam will be held between 10 am and 12 am on Tuesday, Dec 9th in our lecture room, LIFE 106. Final exam is a coordinated exam by the university, and your score will be out of 200 possible points. The final exam is mandatory. Students who do not take the final exam will necessarily receive a failing grade in the class, regardless of other scores earned in the class.

***In-class Clickers 100 points***

In-class clickers will be used to determine participation during class. Your performance in this category will count toward 100 total possible points. Your score in this category cannot exceed 100 points, and cannot exceed the points listed below for each interval. Points cannot be transferred from one interval to another.

\*\* 20 points by Exam 1 \*\* 30 points between Exam 1 and Exam 2

\*\* 25 points between Exam 2 and Exam 3 \*\* 25 points between Exam 3 and Exam 4

Correct answer = 2 pts; Incorrect answer = 1 pt

***Recitation Attendance and Clickers 100 points***

Recitations will be held each Tuesday (see page 2 for the dates) from 2:00 pm to 2:50 pm. Students will be assigned to small groups to work on a set of problems that are related to the class content. There are 10 recitation sessions. In-class clickers will be used to determine your attendance and participation during recitation sessions. Your score in this category is capped at 100 points and cannot exceed the points listed below for each interval. Points cannot be transferred from one interval to another.

\*\* 20 points by Exam 1 \*\* 30 points between Exam 1 and Exam 2

\*\* 20 points between Exam 2 and Exam 3 \*\* 30 points between Exam 3 and Exam 4

Correct answer = 2 pts; Incorrect answer = 1 pt

***Canvas Homework 100 points***

You will have a weekly homework assignment on Canvas. All assignments are due on Thursdays at 11:59 pm. There are 14 assignments with 10 points each. At the end of the semester, the total will be capped at 100 points. The deadlines for the homework assignments are firm and cannot be extended. It is recommended that you attempt the assignments well before the deadline.

***Canvas Quizzes 100 points***

There are 4 Canvas quizzes throughout the semester, with 25 points each. They are given and due before each in-term test.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Types of Assignments** | **Points per Item** | **Number of Assignments** | **Capped Total points** | **Percentage** |
| In-term exams | 100 | 4 | 400 | 40% |
| Final Exam (cumulative) | 200 | 1 | 200 | 20% |
| In-Lecture Clicker | / | / | 100 | 10% |
| Recitation Clicker | / | / | 100 | 10% |
| Canvas Weekly Homework | 10 | 14 | 100 | 10% |
| Canvas Quizzes | 25 | 4 | 100 | 10% |
| **Course Total Points** | | | **1000** | **100%** |

**Total Points /Grading Scale**

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

***PLTL Sessions***

# A Peer-led Team Learning (PLTL) program is available for our section. You sign up and agree to attend 90-minute weekly meetings with a group of students from your class. During each PLTL meeting, a peer leader will guide you to finish a worksheet. It gives students a chance to share ideas and thinking on how to solve problems. Please note, it is not a tutoring session. More information about this program will be given in class and Canvas announcements.

## **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](mailto: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) (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](file:///C:\Users\jdl0126\AppData\Local\Temp\OneNote\16.0\NT\0\Registrar) (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](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fchemistry.unt.edu%2Fundergraduate-program%2Finstructional-resources&data=02%7C01%7Crongzhang%40usf.edu%7C1b411aa2f7ea4f52e6a008d8444fa23a%7C741bf7dee2e546df8d6782607df9deaa%7C0%7C0%7C637334456381902250&sdata=Xth1rZRP7k6cWDR5Rgvzfv%2BgYR1M2vY6hac0ZfxH%2FSA%3D&reserved=0)).

# 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](https://policy.unt.edu/policy/06-039).  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 Blackboard 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>