Office Hours: M/W: 1:00-2:30pm
Office hours will be held at the times listed above virtually via Zoom. The navigation bar on the left side of the Canvas course page contains a link to the Zoom meeting room for Chemistry 1010. You can log in during scheduled office hours or request an appointment at a different time if necessary. Please also check out the office hours offered by the undergraduate teaching fellow (UTF) for CHEM 1010.

Required Materials: *Introductory Chemistry*, Utah State University (Available for **FREE** online)
[https://press.rebus.community/introductorychemistry/](https://press.rebus.community/introductorychemistry/)
(Links to printable copies of the course text will be provided in Canvas.)

A basic scientific calculator is required. No cell phone calculators allowed.

It is required that you have a computer with a high speed internet connection and the Google Chrome browser. Your computer must also have a webcam and a microphone if you wish to take your proctored exams with the Proctorio browser extension.

Prerequisite
No prerequisites.

Course Fees
$15 per credit course fee is applied to all online courses to sustain current digital technologies and support services required for engaging and effective online learning.

Course Description
Chemistry 1010 is an introductory chemistry class designed for non-science majors focusing on chemistry conceptually. This class will provide a basic background of fundamental chemistry concepts as well as highlight the importance of chemistry in everyday applications.

Course Communication
Course announcements will be made via the class Canvas page. **You are responsible for checking Canvas at least once a day for new class announcements!**
Please feel free to email me with questions. I try to maintain a 24-hour response time during the week and a 48-hour response time on weekends. Often, I can respond much faster, however you should not plan to send last minute questions regarding quizzes or exams (i.e. at 10pm on the evening that a quiz is due) and expect a rapid response. For academic questions, I would prefer that you post your questions on Piazza (quiz questions are allowed). You will most likely get a quicker response this way. The link to Piazza is located on the Canvas navigation list on the left. Piazza is a free, online system where students can ask and answer questions. Not only will I be able to answer your questions, but TA’s and other students will be able to offer answers as well. (I always double check that answers provided by students are correct and will provide clarification if needed). **Before you send a question, double check that someone else has not already asked it on Piazza, you may have an answer already waiting for you!** You also have the option to post anonymously on Piazza, although please be aware that as an instructor I will be able to see your identity. It is expected that your communication on Piazza will be respectful and considerate, no harassment of any kind will be tolerated. Piazza is not the forum to discuss personal information. If you have personal concerns, please email me directly.
Regular office hours will be held at the hours listed above. You may also email me to set up office hours by appointment.
Information

will be available through Canvas. For questions regarding your Canvas account or password, or any other technical support, please refer to the information below.

- [http://canvas.usu.edu](http://canvas.usu.edu)
  - Your username is your A#, and your password is your global password (the same one you use for Banner or Aggiemail).
- For Canvas, passwords, or any other computer-related technical support, please refer to the information below.
  - 435 797-4357 (797-HELP)
  - 877 878-8325
  - [http://it.usu.edu](http://it.usu.edu)
  - servicedesk@usu.edu

Supplemental Instruction

The UTF for this course will hold weekly office hours via Zoom. Dates/times and contact information will be announced on Canvas.

Amy Rasmuson

Course Navigation

The course is divided into 12 modules. For each module, you should download the provided lecture notes prior to watching the lecture videos. While watching the lecture videos, you should add your own annotations to the notes provided. After watching the lecture videos, you should work the appropriate problem set examples and check your answers with the solutions provided. Reading the appropriate section of the textbook will also help deepen your understanding of the topic, however I do not test on material in the text that I do not cover in lecture.

You are allowed to work ahead in this class. Due dates for lectures are suggested to help keep you on pace. Quizzes for each module pertaining to a specific exam will remain open until 8pm on the due date for that exam. Recommended completion dates are assigned to the modules to help keep you on pace, however **ALL QUIZ AND EXAM DUE DATES ARE FIRM.** There will be a midterm exam after modules 3, 6, and 9, with a comprehensive final exam after module 12.

Quizzes

There is one “pre-test” quiz, and 13 graded quizzes each worth 10 points. The pre-test is worth 10 points, should be completed without any outside resources and is based on completion only. The first graded quiz is on the introductory class information, while each of the remaining 12 pertain to a specific chapter/module. The pre-test and the introductory quiz must be completed within the first two weeks of the course. Quizzes pertaining to each exam will be available anytime during the open window before the exam due date. For example, quizzes for modules 1-3 must be taken before Exam 1, quizzes for modules 4-6 before Exam 2, quizzes for modules 7-9 before Exam 3, and quizzes for modules 10-12 before the final. All of the lectures and homework should be completed for each module before the quizzes are taken. Quizzes have a 30 minute time limit and should be done individually, but are open note and open book. For each quiz you may have four attempts and your best score is the score that will be kept. The questions on each attempt will not be identical, although they will cover the same concepts. Even if you do well on your first attempt, I strongly encourage you to utilize all four attempts, as they will be good practice for your exams. As the quizzes are all available at the beginning of the semester, **late submissions for quizzes will not be accepted.** Please plan accordingly to avoid the potential issues that may occur with waiting until the due date to submit your quiz.

Midterm Exams

There will be a midterm exam after modules 3, 6, and 9 offered during specific testing
windows as indicated in the course schedule and must be submitted by 8pm on the due date. Each midterm exam will contain 33 questions worth 3 points each, plus one freebie point (100 points total per exam). **You will not be allowed to take the midterm exams after their due dates.** Towards the end of the semester, an optional comprehensive make-up exam will be offered. If you elect to take this exam and do better than one of your three midterms, this score will replace your lowest midterm score. If you do worse, this score will not be counted. The make-up exam is not allowed to replace your final exam score.

**Exams must be taken at a proctored location or by using the Proctorio browser extension.** Proctorio requires the use of a computer with Google Chrome, a webcam and a microphone. Please note that if you are taking the exam using Proctorio, you are allowed to have the linked allowed reference sheet, periodic table and blank scratch paper. **YOU WILL NEED TO PRINT THESE OUT AHEAD OF TIME.** For more information please visit testing.usu.edu and see announcements on Canvas.

An additional 5 points can be earned to be added to each exam score by answering the embedded “quiz” questions within each lecture. Answering 70% of the questions correctly will earn you all 5 points. **These questions can only be answered and points can only be earned by accessing the lectures from either the Course Modules or the Assignments page.**

Due dates are suggested for the lectures to help keep you on pace, however, lectures must be completed by the exam due date to earn points for that exam. More information on this will be provided in the course introduction video.

### Final Exam

A final exam (60 questions) worth 200 points must be taken by using the Proctorio browser extension or at a USU testing center. The final exam will contain approximately 50% material from Modules 1-9, and 50% material from Modules 10-12. The final exam can be taken any time during USU finals week.

An additional 5 points can be earned to be added to the final exam score by answering the embedded “quiz” questions within the lectures from Modules 10-12.

### Coursework and Grading

Your grade will be based on the percentage of points earned from the following coursework:

<table>
<thead>
<tr>
<th>Coursework</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Online Quizzes (Best 12 of 14, @ 10 points/each)</td>
<td>120</td>
</tr>
<tr>
<td>Midterm Exam (3 @ 100 points/each)</td>
<td>300</td>
</tr>
<tr>
<td>*Optional Make-Up Exam (1 @ 100 points, allowed to replace lowest midterm exam score)</td>
<td></td>
</tr>
<tr>
<td>Final Exam</td>
<td>200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>620</td>
</tr>
</tbody>
</table>

In terms of final assignment of grades, you are **guaranteed** the following grades if your final class percentage lies within the indicated ranges in the table below. **In an effort to be fair and consistent to all students, grade breaks will not be shifted based on individual student petitions.**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100 % to 92.0%</td>
</tr>
<tr>
<td>A-</td>
<td>&lt; 92.0 % to 88.0%</td>
</tr>
<tr>
<td>B+</td>
<td>&lt; 88.0 % to 85.0%</td>
</tr>
<tr>
<td>B</td>
<td>&lt; 85.0 % to 81.0%</td>
</tr>
<tr>
<td>B-</td>
<td>&lt; 81.0 % to 77.0%</td>
</tr>
<tr>
<td>C+</td>
<td>&lt; 77.0 % to 73.0%</td>
</tr>
<tr>
<td>C</td>
<td>&lt; 73.0 % to 64.0%</td>
</tr>
<tr>
<td>C-</td>
<td>&lt; 64.0 % to 60.0%</td>
</tr>
<tr>
<td>D+</td>
<td>&lt; 60.0 % to 57.0%</td>
</tr>
<tr>
<td>D</td>
<td>&lt; 57.0 % to 50.0%</td>
</tr>
</tbody>
</table>

### Course Flexibility (Life Happens)

Life happens. In order to provide some flexibility, the following course provisions (as detailed in other locations in the syllabus) are available to all students:

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1. Your lowest two quiz scores are dropped and the best 12 of 14 quizzes (1 pre-test quiz, introductory quiz, and 12 module quizzes) count towards your final grade.
2. Your lowest MIDTERM exam score may be dropped and replaced with your score on the comprehensive makeup exam. Your total of three midterms, OR two best midterm exam scores + comprehensive make up exam score count towards your final grade. (Note: You CANNOT drop your final exam score.)
3. Midterm exams are open for an entire week. This is not to encourage procrastination but rather to allow for flexibility in your schedule and to allow you to take your exam on a day/time that works best for you.
4. Extra credit can be earned by completing the embedded “quiz” questions within the recorded lectures. These questions can only be answered and points can only be earned by accessing the lectures from either the Assignments page or from within the Course Modules. If you have issues that prevent you from accessing and streaming the lectures via either of these methods, please email me.

<table>
<thead>
<tr>
<th>Module 1 (Chapter 1)</th>
<th>September 6th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 2 (Chapter 2)</td>
<td>September 13th</td>
</tr>
<tr>
<td>Module 3 (Chapter 3)</td>
<td>September 22nd</td>
</tr>
<tr>
<td>Module 4 (Chapter 4)</td>
<td>October 1st</td>
</tr>
<tr>
<td>Module 5 (Chapter 5)</td>
<td>October 8th</td>
</tr>
<tr>
<td>Module 6 (Chapter 6)</td>
<td>October 14th</td>
</tr>
<tr>
<td>Module 7 (Chapter 7)</td>
<td>October 23rd</td>
</tr>
<tr>
<td>Module 8 (Chapter 9)</td>
<td>November 1st</td>
</tr>
<tr>
<td>Module 9 (Chapter 10)</td>
<td>November 11th</td>
</tr>
<tr>
<td>Module 10 (Chapter 11)</td>
<td>November 21st</td>
</tr>
<tr>
<td>Module 11 (Chapter 12)</td>
<td>December 3rd</td>
</tr>
<tr>
<td>Module 12 (Chapter 13)</td>
<td>December 10th</td>
</tr>
</tbody>
</table>

Each exam and the associated quizzes must be completed by the final date of the availability window as listed below. Note that the final exam must be taken during USU finals week (Monday December 14th -Friday December 18th).

<table>
<thead>
<tr>
<th>Exam 1 (Modules 1-3)</th>
<th>Sept 23rd-Sept 29th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 2 (Modules 4-6)</td>
<td>Oct 14th-Oct 20th</td>
</tr>
<tr>
<td>Exam 3 (Modules 7-9)</td>
<td>Nov 11th-Nov 17th</td>
</tr>
<tr>
<td>Final Exam (50% Modules 1-9, 50% Modules 10-12)</td>
<td>Dec 14th-Dec 18th</td>
</tr>
</tbody>
</table>

The administration of CHEM 1010 will adhere strictly to the academic policies outlined in the most recent USU General Catalog, which can be found here:
IDEA Objectives
1. Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories).
2. Learning to apply course material (to improve thinking, problem solving, and decisions).
3. Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course.

Course Objectives
By the end of this course, you will be able to:
- Explain the nature of science.
- Identify examples of applied research.
- Identify physical quantities and use appropriate units.
- Use metric prefixes and conversion factors to convert from one set of units to another.
- Describe the particulate nature of matter.
- Distinguish between mass, weight and volume.
- Calculate density.
- Distinguish between potential and kinetic energy.
- Relate how the phase of a material depends on the motion of its particles.
- Demonstrate how the phase of a material depends on the motion of its particles.
- Demonstrate a conceptual understanding of gas laws.
- Differentiate between physical and chemical properties.
- Distinguish between physical and chemical changes.
- Distinguish between an element and a compound.
- Determine the number of atoms of each element in a compound.
- Name and determine formulas for chemical compounds.
- Identify whether something is a mixture or a pure substance.
- Describe historical models of the atom.
- Explain the experiments that led to the discovery of the electron and proton.
- Describe the composition of the atomic nucleus.
- Determine the number of protons, electrons and neutrons in an atom of a given element.
- Explain the nature of electromagnetic radiation.
- Explain the quantum model of the electron.
- Diagram the electron configuration for an atom of a given element.
- Explain the arrangement of the periodic table based on electron configuration.
- Explain periodic table trends- ionization energy and atomic radius.
- Identify three major products of radioactivity- alpha, beta and gamma.
- Identify units of radiation and everyday uses of radioisotopes.
- Predict the products of transmutation of a given isotope.
- Perform calculations using the half-life of a radioisotope.
- Describe and differentiate between fission and fusion.
- Explain the relationship between mass and energy.
- Draw electron dot structures and identify paired and unpaired electrons.
- Use the periodic table to predict the type of ion an atom will form.
- Predict formulas for ionic compounds.
- Describe metallic bonding.
- Use the octet rule to describe how atoms combine to form covalent bonds.
• Predict the molecular geometry of small covalent molecules.
• Differentiate between ionic, polar covalent and nonpolar covalent bonds.
• Explain the role of intermolecular forces in determining the physical properties of a material.
• Describe saturated and unsaturated solutions on a molecular level.
• Identify the components of a solution.
• Calculate the concentration of a solution in molarity.
• Describe the effect of temperature on the solubility of a solute.
• Describe the mechanism of how detergents clean.
• Describe how ions can be removed from hard water.
• Describe how water can be purified.
• Balance a chemical reaction.
• Convert between moles, grams and atoms/molecules of a given substance.
• Use stoichiometry to relate the amounts of reactants to products.
• Calculate the amount of energy released or absorbed by a chemical reaction using bond enthalpies.
• Explain the difference between endothermic and exothermic chemical reactions.
• Describe the requirements that must be met in order for a chemical reaction to occur.
• Describe a real-life example of a catalyst in the destruction of stratospheric ozone.
• Identify acids and bases.
• Describe how the strength of an acid or base relates to the number of ions in solution.
• Calculate the pH of a solution.
• Describe the chemical nature of a buffer and how the addition of a buffer allows a solution to resist a change in pH.
• Identify sources of acid rain and explain the environmental impact of these compounds.
• Describe the impact of atmospheric carbon dioxide on the pH of ocean water.
• Assign oxidation numbers to lone elements or elements in a compound.
• Identify when a chemical undergoes oxidation or reduction.
• Describe the relationship between oxidation and reduction and the generation of electricity in a fuel cell.
• Describe examples of electrolysis.
• Compare and contrast the processes of corrosion and combustion.
• Identify the structures of saturated and unsaturated hydrocarbons.
• Identify the functional groups in alcohols, phenols, ethers, esters, amines, amides, aldehydes, ketones, carboxyls, and carbonyls.
• Describe how polymers are synthesized from monomers and the application of this process in the production of plastics.
• Identify the basic components of a cell and the four major classes of biomolecules.
• Recognize the molecular structures of simple and complex carbohydrates.
• Compare and contrast the properties of fats and steroids.
• Classify the structure of a protein based upon the organization of its amino acids and describe how enzymes work.
• Identify nucleic acids as polymers of nucleotides and describe how they code for the building of proteins.
• Distinguish vitamins from minerals and the roles they play in nutrition.
• Classify metabolic reactions as either catabolic or anabolic.