



CHE101: INTRODUCTION TO CHEMISTRY

Credit Hours: 4

Contact Hours: This is a 4-credit course, offered in accelerated format. This means that 16 weeks of material is covered in 8 weeks. The exact number of hours per week that you can expect to spend on each course will vary based upon the weekly coursework, as well as your study style and preferences. You should plan to spend 14-20 hours per week in each course reading material, interacting on the discussion boards, writing papers, completing projects, and doing research.

COURSE DESCRIPTION AND OUTCOMES

Course Description:

This course will provide an introduction to chemistry. There will be a broad range of topics covered from chemistry in our lives to matter, energy, atoms and elements, nuclear chemistry, compounds, reactions and solution chemistry. This course fulfills a chemistry for nursing requirement. This course fulfills a general education Natural and Physical Science requirement. This is not an approved Colorado GT Pathways course.

Course Overview:

This course will provide you with an introduction to chemistry and how it can be utilized in the health-related profession. The topics covered range from chemistry in our lives to matter, energy, atoms and elements, nuclear chemistry, compounds, reactions, and solution chemistry. This course will utilize the MasteringChemistry site for the Opening Exercises, Check Your Understanding, Mastery Exercises, Midterm and Final Exams. It also serves to offer great tutorials for areas where you need additional help. There will also be virtual laboratory experiments and assignments in LateNiteLabs, to go along with the material being covered in the class during five modules.

Course Learning Outcomes:

1. Apply the SI units used in chemistry for measurements by using prefixes and significant figures as well as using conversion factors to solve problems.
2. Identify and classify states of matter and energy, including changes of state and conversion between units of energy.
3. Classify elements found in the Periodic Table and describe atoms through atomic number, mass number, and isotopic information.
4. Describe radioactivity, the detection and measurement of it, medical applications, and the concepts of nuclear reactions, fission, and fusion.
5. Write names and formulas for ionic and molecular compounds, use electronegativity to determine polarity of a bond, predict the 3-D shape of a molecule, and describe the attractive forces in compounds.
6. Calculate molar mass and use the concept in balancing equations and chemical reactions.
7. Describe the properties and concepts of pH, acids, bases, and buffers, including explaining acid-base equilibrium and acid-base reaction equations.
8. Describe the properties and concepts involved in solutions, including concentrations and dilutions.

COLORADO GT PATHWAYS COURSE

Colorado Guaranteed Transfer (GT) Pathways Course: The Colorado Commission on Higher Education has approved [CHE101: Introduction to Chemistry](#) for inclusion in the Guaranteed Transfer (GT) Pathways program in the **GT-SC1** category. For transferring students, successful completion with a minimum C- grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to <http://highered.colorado.gov/academics/transfers/gtpathways/curriculum.html>

The table in **Appendix A** details the specific alignment of Course Learning Outcomes and Assessments to gtPathways Content and Criteria requirements.

PARTICIPATION & ATTENDANCE

Prompt and consistent attendance in your online courses is essential for your success at CSU-Global Campus. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact your advisor.

Online classes have deadlines, assignments, and participation requirements just like on-campus classes. Budget your time carefully and keep an open line of communication with your instructor. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

COURSE MATERIALS

Textbook Information is located in the CSU-Global Booklist on the Student Portal.

COURSE SCHEDULE

Due Dates

The Academic Week at CSU-Global begins on Monday and ends the following Sunday.

- **Discussion Boards:** The original post must be completed by Thursday at 11:59 p.m. MT and Peer Responses posted by Sunday 11:59 p.m. MT. Late posts may not be awarded points.
- **Opening Exercises:** Take the opening exercise before reading each week's content to see which areas you will need to focus on. You may take these exercises as many times as you need. The opening exercises will not affect your final grade.
- **Mastery Exercises:** Students may access and retake mastery exercises through the last day of class until they achieve the scores they desire.
- **Critical Thinking:** Assignments are due Sunday at 11:59 p.m. MT.

WEEKLY READING AND ASSIGNMENT DETAILS

Module 1

Readings

- Chapters 1 & 2 in *Chemistry: An Introduction to General, Organic, and Biological Chemistry* Reading 2

Opening Exercise (0 points)

Complete the Opening Exercise in MasteringChemistry (MC) for Module 1.

Discussion (25 points)

Lab Assignment (20 points)

Before completing this assignment, you must complete the experiments in LateNiteLabs for Module 1: Density—A Characteristic Property.

Download the document attached to this assignment in the Module 1 folder, complete the assignment, and upload your results, including any required Excel spreadsheets, tables, or graphs.

Critical Thinking (50 points)

Option #1: Approximation of the Scientific Method

As we learned from the module reading this week, at its core science is simply a method for investigating the world around us. Making observations, forming hypotheses, and testing them – it's something we do all the time without even realizing we're doing it.

For this week's assignment, think of a situation in your life where you used an approximation of scientific methods. This can be major or minor, from home, work, school or any other relevant circumstance.

Describe the process you went through and explain the following:

1. What question were you trying to address?
2. What hypothesis did you formulate?
3. How did you test it—what was your “experiment”?
4. What was the result?
5. If you were trying to make this a more formal experiment, what is something you could do differently to test your ideas even better?

Now look back at this experience and review your methods. Did you use a control? Did you repeat the test? What other variables could you investigate or eliminate? Have you ever done something similar again, and, if so, how do your results compare?

Write a paper in conformity with the CSU-Global Guide to Writing and APA. Your paper should be between 2 to 3 pages long. Items that should be included, at a minimum, are a title page, an introduction, a body (which answers the questions posed in the problem), and a conclusion paragraph (which addresses your findings and what you have determined from the data and your analysis). As with all written assignments, you should have in-text citations and a reference page too. Please include any tables of calculations, calculated values, and graphs associated with this problem in the body of your assignment response. Your reference section should include at least one peer-reviewed, scholarly reference.

Option #2: Scientific Method Application

As we learned from the module reading this week, at its core science is simply a method for investigating the world around us: making observations, forming hypotheses, and testing them.

For this week's assignment, think of a situation where someone used the scientific method. This can be major or minor, in a business, at school or in society.

Describe the process you went through and explain the following:

1. What question were they trying to address?
2. What hypothesis did they formulate?
3. How did they test it—what was their “experiment”?
4. What was the result?
5. If they were trying to make this a more formal experiment, what is something that they could do differently to test their ideas even more effectively?
6. Did they use a control? Did they repeat the test? What other variables could you investigate or eliminate?

Write a paper in conformity with the CSU-Global Guide to Writing and APA. Your paper should be between 2 to 3 pages long. Items that should be included, at a minimum, are a title page, an introduction, a body (which answers the questions posed in the problem), and a conclusion paragraph (that addresses your findings and what you have determined from the data and your analysis). As with all written assignments, you should have in-text citations and a reference page too. In the body of your assignment response, please include any tables of calculations, calculated values, and graphs associated with this problem. Your reference section should include at least one peer-reviewed, scholarly reference.

Mastery Exercise (10 points)

Unlike in your other courses, you are only allowed to attempt this exercise once. Therefore, it is best to attempt this only once you feel you have a solid understanding of the chapter content for this week. In order to avoid a grade penalty, the Mastery Exercise must be completed by the assigned due date. Your instructor will transfer your grade from MasteringChemistry to Schoology, so you may see a delay in the score showing in Schoology.

Complete the Mastery Exercise in MasteringChemistry for Module 1.

Module 2

Readings

- Chapter 3 in *Chemistry: An Introduction to General, Organic, and Biological Chemistry* Reading 2

Opening Exercise (0 points)

Complete the Opening Exercise in MasteringChemistry (MC) for Module 2.

Discussion (25 points)

Critical Thinking (50 points)

Option #1: Gasoline Usage

On a trip through China, you decide to rent a motorcycle that has a fuel tank capacity of 22 L and gets 5.7 L/100km for the fuel economy. Complete the following calculations and write a 2- to 3-page report discussing the data and the calculations performed.

1. How far can you go on one full tank of gasoline, in miles?
2. If the price of gasoline is \$4.73/gal, what would be the cost to refill the tank?
3. If you average 60 km/h, how many hours will it take to use the tank of gasoline?
4. If the density of gasoline is 0.74 g/mL, what is the mass, in grams, of the fuel in the tank?
5. When 1.00 g of gasoline burns, 47 kJ of energy is released. How many kilojoules are produced when the whole tank of fuel is burned?

Write a report in conformity with the CSU-Global Guide to Writing and APA. Items that should be included, at a minimum, are a title page, an introduction, a body (which answers the questions posed in the problem), and a conclusion paragraph (which addresses your findings and what you have determined from the data and your analysis). As with all written assignments, you should have in-text citations and a reference page too. Please include any tables of calculations, calculated values, and graphs associated with this problem in the body of your assignment response.

Option #2: Energy Bar Consumption

After two hours of cross-country skiing, you grab an energy bar with a mass of 67 g. The nutrition facts are listed as 39 g of carbohydrates, 5 g of fat, and 10 g of protein. Complete the following calculations and write a 2- to 3-page report discussing the data and the calculations performed.

1. What are the total kilocalories (calories) for this energy bar based on the energy values for carbohydrates, fat, and protein? Round your answer to the ones place.
2. How many kilojoules are in the energy bar? Round your answer to the ones place.
3. If you eat 227 kJ, how many grams of the energy bar did you consume? Round to the nearest tenth.
4. If you skied moderately and were using energy at a rate of 3316 kJ/h, how many energy bars can you eat to balance the kJ burned and the kJ consumed over a period of 30 minutes of skiing? Round to the nearest tenth.

Write a report in conformity with the CSU-Global Guide to Writing and APA. Items that should be included, at a minimum, are a title page, an introduction, a body (which answers the questions posed in the problem), and a conclusion paragraph (which addresses your findings and what you have determined from the data and your analysis). As with all written assignments, you should have in-text citations and a reference page too. Please include any tables of calculations, calculated values, and graphs associated with this problem in the body of your assignment response.

Lab Assignment (25 points)

Before completing this assignment, you must complete the experiments in LateNiteLabs for Module 2: Enthalpy Change for the Decomposition of Ammonium Chloride.

Download the document attached to this assignment in the Module 2 folder, complete the assignment, and upload your results, including any Excel spreadsheets, tables, or graphs required.

Mastery Exercise (10 points)

Unlike in your other courses, you are only allowed to attempt this exercise once. Therefore, it is best to attempt this only once you feel you have a solid understanding of the chapter content for this week. In order to avoid a grade penalty, the Mastery Exercise must be completed by the assigned due date. Your instructor will transfer your grade from MasteringChemistry to Schoology, so you may see a delay in the score showing in Schoology.

Complete the Mastery Exercise in MasteringChemistry for Module 2.

Module 3

Readings

- Chapter 4 in *Chemistry: An Introduction to General, Organic, and Biological Chemistry* Reading 2

Opening Exercise (0 points)

Complete the Opening Exercise in MasteringChemistry (MC) for Module 3.

Discussion (25 points)**Lab Assignment (25 points)**

Before completing this assignment, you must complete the experiments in LateNiteLabs for Module 3: Identifying Halide Ions.

Download the document attached to this assignment in the Module 3 folder, complete the assignment, and upload your results, including any Excel spreadsheets, tables, or graphs required.

Critical Thinking (50 points)**Option #1: Element Identification from Percentage of Abundance**

When a sample is vaporized and injected into a mass spectrometer, the following results are obtained.

Mass of Atom (amu)	% Abundance
143.911995	3.07
146.914893	14.99
147.914818	11.24
148.917180	13.82
149.917271	7.38
151.919728	26.75
153.922205	22.75

Calculate the atomic mass using the weighted average mass method and identify the element. Write a 2-3 page report discussing the data and the calculations performed.

Write a report in conformity with the CSU-Global Guide to Writing and APA. Your paper should be between 2 to 3 pages long. Items that should be included, at a minimum, are a title page, an introduction, a body which answers the questions posed in the problem, and a conclusion paragraph that addresses your findings and what you have determined from the data and your analysis. As with all written assignments, you should have in-text citations and a reference page too. Please include any tables of calculations, calculated values and graphs associated with this problem in the body of your assignment response. Your reference section should include at least one peer-reviewed, scholarly reference.

Option #2: Element Identification from Percentage of Isotope

An element consists of 0.09% of an isotope with a mass of 119.904020 amu, 2.55% of an isotope with a mass of 121.903047 amu, 0.89% of an isotope with a mass of 122.904273 amu, 4.74% of an isotope with a mass of 123.902819 amu, 7.07% of an isotope with a mass of 124.904425 amu, 18.84% of an isotope with a mass of 125.903306 amu, 31.74% of an isotope with a mass of 127.904461 amu, and 34.08% of an isotope with mass of 129.906223 amu.

Calculate the atomic mass using the weighted average mass method and identify the element. Write a 2-3 page report discussing the data and the calculations performed.

Write a report in conformity with the CSU-Global Guide to Writing and APA. Your paper should be between 2 to 3 pages long. Items that should be included, at a minimum, are a title page, an introduction, a body which answers the questions posed in the problem, and a conclusion paragraph

that addresses your findings and what you have determined from the data and your analysis. As with all written assignments, you should have in-text citations and a reference page too. Please include any tables of calculations, calculated values and graphs associated with this problem in the body of your assignment response. Your reference section should include at least one peer-reviewed, scholarly reference.

Mastery Exercise (10 points)

Unlike in your other courses, you are only allowed to attempt this exercise once. Therefore, it is best to attempt this only once you feel you have a solid understanding of the chapter content for this week. In order to avoid a grade penalty, the Mastery Exercise must be completed by the assigned due date. Your instructor will transfer your grade from MasteringChemistry to Schoology, so you may see a delay in the score showing in Schoology.

Complete the Mastery Exercise in MasteringChemistry for Module 3.

Module 4

Readings

- Chapter 5 in *Chemistry: An Introduction to General, Organic, and Biological Chemistry* Reading 2

Opening Exercise (0 points)

Complete the Opening Exercise in MasteringChemistry (MC) for Module 4.

Discussion (25 points)

Lab Assignment (25 points)

Before completing this assignment, you must complete the experiments in LateNiteLabs for Module 4: Radiation.

Download the document attached to this assignment in the Module 4 folder, complete the assignment, and upload your results, including any Excel spreadsheets, tables, or graphs required.

Midterm (150 points)

This course requires that you complete a Midterm Exam that covers the material represented in the first four modules of the course. To best prepare for the Midterm, complete the Midterm review and other example questions/activities in MasteringChemistry (MC). You have only one shot at the Midterm Exam. Here is the suggested strategy:

1. Review the mastery exercises you missed and the adaptive follow-ups for each module. Make sure you understand where you went wrong.
2. Take the midterm review, treating it just like the exam.
3. Review the questions that you missed on the review. Make sure you understand where you went wrong. Take the adaptive follow-up for the midterm review.
4. Refer to Your Study Area for extra practice.
5. Continue reviewing the problems that you are missing.
6. Take notes.
7. Contact your instructor for help as you practice.
8. Now that you are ready and confident, open MC, and take the Midterm Exam.

Mastery Exercise (10 points)

Unlike in your other courses, you are only allowed to attempt this exercise once. Therefore, it is best to attempt this only once you feel you have a solid understanding of the chapter content for this week. In order to avoid a grade penalty, the Mastery Exercise must be completed by the assigned due date. Your instructor will transfer your grade from MasteringChemistry to Schoology, so you may see a delay in the score showing in Schoology.

Complete the Mastery Exercise in MasteringChemistry for Module 4.

Module 5

Readings

- Chapter 6 in *Chemistry: An Introduction to General, Organic, and Biological Chemistry* Reading 2

Opening Exercise (0 points)

Complete the Opening Exercise in MasteringChemistry (MC) for Module 5.

Discussion (25 points)

Critical Thinking (50 points)

Option #1: Cations and Anions

Given the following list of cations and anions: name each of the cations, name each of the anions, and then name the compound that forms between each pair of anions and cations (there will be 12 total). After you name the compound, determine a common use for this compound.

Cations	Anions
Ca ²⁺	BrO ₃ ⁻
Co ²⁺	CrO ₄ ²⁻
Ag ⁺	PO ₄ ³⁻

Write a 2-to-3-page report, in conformity with the CSU-Global Guide to Writing and APA, discussing the data and the calculations performed. Items that should be included, at a minimum, are a title page, an introduction, a body (which answers the questions posed in the problem), and a conclusion paragraph (which addresses your findings and what you have determined from the data and your analysis). As with all written assignments, you should have in-text citations and a reference page too. Please include any tables of calculations, calculated values, and graphs associated with this problem in the body of your assignment response.

Option #2: Electron Arrangements

Given the following electron arrangements, give the formula of the cation and name it, give the formula of the anion and name it, and then determine the formula of the compound they form and name it.

After you name the compounds, determine a common use for this compound.

Electron Arrangements	
2,8,3	2,8,7
2,8,8,1	2,8,7

2,4	2,6
2,4	2,8,7
1	2,7
2,8,5	2,8,7
2,8,1	2,7
2,1	2,6
2,8,3	2,8,6
2,8,8,2	2,5
2,8,1	2,5
2,2	2,3

Write a 2-to-3-page report, in conformity with the CSU-Global Guide to Writing and APA, discussing the data and the calculations performed. Items that should be included, at a minimum, are a title page, an introduction, a body (which answers the questions posed in the problem), and a conclusion paragraph (which addresses your findings and what you have determined from the data and your analysis). As with all written assignments, you should have in-text citations and a reference page too. Please include any tables of calculations, calculated values, and graphs associated with this problem in the body of your assignment response.

Lab Assignment (25 points)

Before completing this assignment, you must complete the experiments in LateNiteLabs for Module 5: Qualitative Analysis of Group I Cations.

Download the document attached to this assignment in the Module 5 folder, complete the assignment, and upload your results, including any Excel spreadsheets, tables, or graphs required.

Mastery Exercise (10 points)

Unlike in your other courses, you are only allowed to attempt this exercise once. Therefore, it is best to attempt this only once you feel you have a solid understanding of the chapter content for this week. In order to avoid a grade penalty, the Mastery Exercise must be completed by the assigned due date. Your instructor will transfer your grade from MasteringChemistry to Schoology, so you may see a delay in the score showing in Schoology.

Complete the Mastery Exercise in MasteringChemistry for Module 5.

Module 6

Readings

- Chapter 7 in *Chemistry: An Introduction to General, Organic, and Biological Chemistry* Reading 2

Opening Exercise (0 points)

Complete the Opening Exercise in MasteringChemistry (MC) for Module 6.

Discussion (25 points)

Lab Assignment (25 points)

Before completing this assignment, you must complete the experiments in LateNiteLabs for Module 6: Mole to Mole Relationship between Cu and Ag.

Download the document attached to this assignment in the Module 6 folder, complete the assignment, and upload your results, including any Excel spreadsheets, tables, or graphs required.

Mastery Exercise (10 points)

Unlike in your other courses, you are only allowed to attempt this exercise once. Therefore, it is best to attempt this only once you feel you have a solid understanding of the chapter content for this week. In order to avoid a grade penalty, the Mastery Exercise must be completed by the assigned due date. Your instructor will transfer your grade from MasteringChemistry to Schoology, so you may see a delay in the score showing in Schoology.

Complete the Mastery Exercise in MasteringChemistry for Module 6.

Module 7

Readings

- Chapter 10 in *Chemistry: An Introduction to General, Organic, and Biological Chemistry* Reading 2

Opening Exercise (0 points)

Complete the Opening Exercise in MasteringChemistry (MC) for Module 7.

Discussion (25 points)

Lab Assignment (25 points)

Before completing this assignment, you must complete the experiments in LateNiteLabs for Module 7: Titration of Strong and Weak Acids.

Download the document attached to this assignment in the Module 7 folder, complete the assignment, and upload your results, including any Excel spreadsheets, tables, or graphs required.

Mastery Exercise (10 points)

Unlike in your other courses, you are only allowed to attempt this exercise once. Therefore, it is best to attempt this only once you feel you have a solid understanding of the chapter content for this week. In order to avoid a grade penalty, the Mastery Exercise must be completed by the assigned due date. Your instructor will transfer your grade from MasteringChemistry to Schoology, so you may see a delay in the score showing in Schoology.

Complete the Mastery Exercise in MasteringChemistry for Module 7.

Module 8

Readings

- Chapter 9 in *Chemistry: An Introduction to General, Organic, and Biological Chemistry* Reading 2

Opening Exercise (0 points)

Complete the Opening Exercise in MasteringChemistry (MC) for Module 8.

Discussion (25 points)

Mastery Exercise (10 points)

Unlike in your other courses, you are only allowed to attempt this exercise once. Therefore, it is best to attempt this only once you feel you have a solid understanding of the chapter content for this week. In order to avoid a grade penalty, the Mastery Exercise must be completed by the assigned due date. Your instructor will transfer your grade from MasteringChemistry to Schoology, so you may see a delay in the score showing in Schoology.

Complete the Mastery Exercise in MasteringChemistry for Module 8.

Final Exam (200 points)

This course requires that you complete a Final Exam that covers the material represented in the entire course. To best prepare for the Final Exam, complete the Final review and other example questions/activities in MasteringChemistry (MC). You have only one shot at the Final Exam. Here is the suggested strategy:

1. Review the mastery exercises you missed and the adaptive follow-ups for each module. Make sure you understand where you went wrong.
2. Review the questions that you missed on the midterm. Make sure you understand where you went wrong.
3. Take the final review, treating it just like the exam.
4. Review the questions that you missed on the review. Make sure you understand where you went wrong. Take the adaptive follow-up for the final review.
5. Refer to Your Study Area for extra practice.
6. Continue reviewing the problems that you are missing.
7. Take notes.
8. Contact your instructor for help as you practice.
9. Now that you are ready and confident, open MC, and take the Final Exam.

COURSE POLICIES

Grading Scale	
A	95.0 – 100
A-	90.0 – 94.9
B+	86.7 – 89.9
B	83.3 – 86.6
B-	80.0 – 83.2
C+	75.0 – 79.9
C	70.0 – 74.9
D	60.0 – 69.9
F	59.9 or below

Course Grading

20% Discussion Participation
0% Opening Exercises
8% Mastery Exercises
17% Lab Assignments
20% Critical Thinking Assignments
35% Exams

IN-CLASSROOM POLICIES

For information on late work and incomplete grade policies, please refer to our [In-Classroom Student Policies and Guidelines](#) or the Academic Catalog for comprehensive documentation of CSU-Global institutional policies.

Academic Integrity

Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing /re-purposing your own work (see *CSU-Global Guide to Writing and APA Requirements* for percentage of repurposed work that can be used in an assignment), unauthorized possession of academic materials, and unauthorized collaboration. The CSU-Global Library provides information on how students can avoid plagiarism by understanding what it is and how to use the Library and Internet resources.

Citing Sources with APA Style

All students are expected to follow the *CSU-Global Guide to Writing and APA Requirements* when citing in APA (based on the APA Style Manual, 6th edition) for all assignments. For details on CSU-Global APA style, please review the APA resources within the CSU-Global Library under the “APA Guide & Resources” link. A link to this document should also be provided within most assignment descriptions in your course.

Disability Services Statement

CSU-Global is committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Disability Resource Coordinator at 720-279-0650 and/or email ada@CSUGlobal.edu for additional information to coordinate reasonable accommodations for students with documented disabilities.

Netiquette

Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom. If you have concerns about something that has been said, please let your instructor know.