

Course Overview

Chemistry is the study of properties and transformations of matter. It provides a central platform to study other disciplines such as biology, geology, material science, physics, medicine, and many branches of engineering. The primary goal of this course will be to help you develop a solid picture of matter and their properties at the atomic and molecular levels.

This yearlong course is designed to meet the curriculum requirements of Chippewa Valley Technical College's General Chemistry 806-134. GHS has an articulation agreement with CVTC that provides transcribed credit for General Chemistry. Thus, this course is considered a CVTC course, as well as a GHS course, and you may choose to receive dual credit. Upon successful completion, you will receive 1.0 GHS credit for General Chemistry and 4.0 CVTC college credits for General Chemistry 806-134. FYI, your CVTC college credits are transferrable to other technical colleges and four-year universities.

Course Topics.

Topics to be covered include: characteristics of matter, periodic relationships of elements, chemical bonding, chemical reactions, chemical equilibrium, analysis of chemical substances, characteristics of aqueous solutions, acids, bases, and gas laws. Additional topics may include chemical equilibrium and oxidation-reduction. These topics will be covered at a rapid pace. This includes learning about the presented concepts, conducting related laboratories, and testing your retention and problem solving skills.

Course Competencies.

1. Perform Safe Laboratory Practices
2. Apply Scientific Method
3. Solve Problems Using Quantitative Data
4. Explain the Characteristics of Matter
5. Analyze the Periodic Relationships of the Elements
6. Describe Chemical Bonding
7. Explain the Behavior of Matter During a Chemical Reaction
8. Calculate Quantities of Substances
9. Analyze Chemical Substance
10. Characterize Aqueous Solutions
11. Analyze Acid-Base Chemistry
12. Characterize the Behavior of Gases

Course Prerequisites.

Chemistry and Algebra II with a grade of "C" or better

Course Materials

- Garoutte, M. P. & Mahoney, A. B. (2015). *Introduction Chemistry: A Guided Inquiry*. Hoboken, NJ: John Wiley & Sons, Inc.
- Hein, M. & Arena, S. (2014). *Foundations of College Chemistry*. 14th Ed. Hoboken, NJ: John Wiley & Sons, Inc.
- Rice University. (2025). *Chemistry*. 2nd Ed. OpenStax. <https://openstax.org/details/books/chemistry-2e>
- School Issued iPad
- Loose-leaf Paper and Binder OR Composition-style Notebook and Binder
- Scientific Calculator (capable of executing typical mathematical operations, including logarithms, exponential functions, etc. and handling scientific notation)

Course Format

Inquiry Instructional Approach.

This strategic methodology will allow us to work as a team to outline learning objectives, organize and cover concepts (e.g., guided inquiry activities, argument driven inquiry investigations), as well as infuse structured guided and independent practice opportunities that offer immediate feedback and opportunity for sensemaking. Such interactive learning tasks will be organized in a binder, which will not only encourage organization and reflective practice, but also serve as a portfolio of your learning.

Daily Coursework.

Readings. College-level textbook and/or scientific article readings will be assigned with each lesson.

Cornell-style Notes. Cornell-style notes will be provided and are strongly encouraged to be taken. This research-based approach to note taking, if followed, will encourage concentration and retention. You may choose to use your loose-leaf paper to complete these notes and then place them in your binder, or you may choose to use your composition-style notebook.

Problem Sets. A list of recommended problems will be assigned from our textbook and/or guided inquiry activities. You are strongly encouraged to solve all problems. Completing this work will help you think critically and practice your problem solving skills. Answer keys will be provided so you can get immediate feedback and seek out any additional assistance when needed. You may choose to use your loose-leaf paper to complete these problem sets and then place them in your binder, or you may choose to use your composition-style notebook.

Daily coursework will not be graded since its primary role in our learning is solidifying sensemaking.

Laboratory Studies/Reports.

Laboratories. Laboratories will allow for a hands-on, direct experience of concepts covered in class. You will gain proper laboratory technique skills, as well as communicate procedures, observations, results, and conclusions in words and writing through the Argument Driven Inquiry model. Furthermore, you will apply experimental techniques to solve chemical problems. To enhance the laboratory experience, some video-based interactives and interactive computer simulations will also be utilized.

Your competency in the lab will be assessed in two ways: via your laboratory log and laboratory reports. A laboratory log will include your pre- through post-lab recordings. Your log will be submitted and serve as formative assessments of your learning. Lab log submissions may be revisited, if you so choose, to show growth in your understanding. Alternatively, laboratory reports are summative assessments and therefore may not be redone, with the exception of your first report. Both must be submitted on time (see syllabus Late Policy section).

Safety in the lab is vital. You will be required to sign and abide by a safety contract, as well as follow laboratory directions in order to participate.

Quizzes, Tests, Midterm Exam, and Final Exam.

Quizzes. Quizzes are formative assessments that will be given approximately weekly, after a lesson or small group of lessons. They will be assigned on Formative, a web-based assessment tool. They must be taken on time (see syllabus Late Policy section) and may not be retaken. Quizzes related to an upcoming test will be closed 48 hours prior to the test date in order to share ideal responses.

Tests. Tests will be given after the completion of each chapter or chapter grouping. Tests are summative assessments that must be taken on time (see syllabus Late Policy section) and may not be retaken.

Midterm and Final Exams. Two comprehensive exams will be given throughout the school year. These exams will take place approximately at the middle and end of the school year. Midterm and final exams are summative assessments that must be taken on time (see syllabus Late Policy section) and may not be retaken.

Grading Scale and Assessment Values

Since this is a dual credit course, you will have two separate grades reported: one according to GHS policy and the other according to CVTC policy.

GHS GRADING

Assessments will be given the following point values.

- Mid-Check for Understanding/Practices (i.e., formative assessments), 30%
- End-Check for Understanding/Practices (i.e., summative assessments), 70%

Quarter will be determined through the weighted grading system described above. Semester grades will be determined through the weighted system below.

- 45% Quarter A
- 45% Quarter B
- 10% Comprehensive Semester Exam*

CVTC GRADING

A final grade will be determined through a weighted system.

- 40% Semester I
- 5% Comprehensive Midterm Exam
- 40% Semester II
- 15% Comprehensive Final Exam

*NOTE: The comprehensive exam will be dropped if it adversely influences the semester grade.

GHS Grading Scale

100-93..... A	89-87B+	79-77 C+	69-67 D+	59-57 F
92-90..... A-	86-83B	76-73..... C	66-63 D	
	82-80B-	72-70..... C-	62-60 D-	

Late Policy.

Coursework must be turned in on the assigned due dates. Late coursework will be limited to a maximum score of 70%. Completed notes and problem sets must be submitted in addition to the missing, closed quiz to receive limited credit. Not taking a test or exam on the assigned date and time will limit your maximum score to no more than 90% if taken within 48 hours of the scheduled test time, or 80% if taken after 48 hours. Special consideration may be given if a doctor or parent note is provided to confirm illness or family emergency. All make-up exams must be completed within 5 days of the originally scheduled exam time.

Grading Feedback from Instructor.

Typically, CVTC instructors will return assignments within one week of the due date, but no more than two weeks. It is my intent to return your tests the next day or as soon as everyone has completed the test, whichever comes first. And, I will return your laboratory reports within one week of the due date or as soon as everyone has completed the report, whichever comes first.

Academic Assistance

If you should have moments of struggle in this course, please see me immediately. I will help you to get to the root of your concerns and establish a plan of action that provides additional scaffolding (e.g., individualized instruction, graphic organizers, targeted problem-solving opportunities, etc.). I will also be monitoring your growth through formative assessment opportunities and will initiate a meeting, plan of action, etc. if necessary. Your academic success is very important to me.

Guidelines for Success

You are starting your career right now. How so? Your classroom performance is likely to be a direct reflection of the type of performer you will be in your job. For example, if you show up to class late, you run the risk of that behavior pouring over into work. Because of this, be sure that you are performing at a level that you believe is the best representation of yourself at all times. Here are some additional guidelines for success:

- **Prepare yourself for learning** before the day of class. Read all the assigned materials and complete the assigned learning tasks. Ask questions about the content. Think about how the content relates to you, and how it might connect to your future career.
- **Engage yourself in our learning community.** Actively participate. The more you do, the more you will learn.
- **Complete tasks on time.** It is disruptive to the learning process when students are arriving at different times or missing deadlines. Notify your instructor if you have a situation or a scheduling conflict.
- **Dress appropriately** when learning on campus or when performing tasks in learning labs.
- **Communicate professionally.** Be respectful to each other and each other's ideas. This means not interrupting others or talking to your neighbor while others are talking. Use positive, inclusive language when addressing someone's comments, even when their opinion is different than your own. Type professional emails that include a salutation and contain a business tone.

CVTC Academic Honesty Statement

Academic misconduct in any portion of the academic work for this course is a serious offense. Therefore, it is expected that all students conduct themselves with honesty, integrity, and professionalism. Since this is a college course, we will follow CVTC's academic dishonesty policy.

The CVTC Student Handbook has details about Academic Honesty, which you should read and understand, so that you can apply Academic Honesty principles to your course work. (To find the most current copy of the handbook online, Google "CVTC WI Student Handbook.") The handbook covers guidelines on plagiarism, cheating, misrepresentation, falsifying, misuse of others materials, fabrication, and other related topics. I will share just a couple of specific examples with you below.

Students are expected to do their own work at all times unless advised that collaboration is acceptable. When you take a test, you are expected to keep your eyes on your own paper and protect your test paper from being copied by a classmate. You may not have someone take an online/hybrid or proctored test for you. Do not buy course work, have others complete any part of your course activities or assessments for you, or share your work with others (even after the course is completed). This would be academically dishonest. Copying from another person's paper or test is academic dishonesty; it will result in a grade of "0" for that assignment. In addition, you will be referred to Student Services for discipline based on college policy.

You may use facts from other sources if you re-write them in your own words. Any time you quote directly from another source or paraphrase substantially, you must cite the source you used. Failure to use proper citation procedure is considered plagiarism. Plagiarism will result in a grade of "0" if it is flagrant and/or deliberate. In addition, you will be referred to Student Services for discipline based on college policy.

CVTC Credit for Prior Learning (CPL) Statement

CVTC Credit for Prior Learning grants college credit for previous knowledge and skills you have mastered through work or volunteer experiences. You might also have previous knowledge from certifications, apprenticeships, military training and professional development. If you are interested in learning more about this opportunity, please contact the Credit for Prior Learning Office.

CVTC Equity, Diversity, Equal Opportunity, and Disabilities Accommodations Statement

CVTC will provide equal access to and opportunity in its programs and facilities, without regard to race, ethnicity, color, creed, religion, national origin, ancestry, sex, disability, age, arrest or conviction record, marital status, parental status, mental health, veteran's status, pregnancy, or sexual orientation.

Tentative Lesson Schedule, Semester I

Week	Lesson Topics	Readings	Laboratory Assessments	Written Assessments
UNIT 1A...Basic Tools of Chemistry: Matter, Measurement, Atoms, and Elements				
Sep 3	Lab Safety, Intro to Chemistry			Gen Chem Pre-Assessment
Sep 8	Intro to Chemistry & Standards for Measurement	1.1-1.4 & 2.1-2.8	Qualitative Analysis of Unknowns & Density is a Periodic Property	C1 (CA2) Quiz & C2 (CA4,5,6) Quiz
Sep 15	Elements and Compounds & Properties of Matter	3.1-3.3 & 4.1-4.6	Periodic Trends and the Properties of Elements	C3 (CA3) Quiz & C4 (CA25) Quiz
Sep 22	Properties of Matter	4.1-4.6		Unit 1A Test
UNIT 1B...Basic Tools of Chemistry: Molecules, Ions, and Their Compounds				
Sep 29	Early Atomic Theory and Structure	5.1-5.6		C5 (CA7) Quiz
Oct 6	Nomenclature of Ionic Compounds	6.1-6.5		C6 (CA11,12,15) Quiz & Unit 1B Test
UNIT 1C...Basic Tools of Chemistry: Chemical Equations and Stoichiometry				
Oct 13	Quantitative Composition of Compounds	7.1-7.5	A Mole of What?	C7 (CA18,29,3) Quiz
Oct 20	Chemical Equations	8.1-8.5	Precipitation Reactions and Solubility Rules	C7 Test & C8 (CA19) Quiz
Oct 27	Chemical Equations	8.1-8.5		C8 (CA21,2) Quiz
Nov 3	Calculations from Chemical Equations	9.1-9.5	Gravimetric Analysis of Calcium and Hard Water	C8 Test & C9 (CA20A,B) Quiz
Nov 10	Calculations from Chemical Equations	9.1-9.5		Unit 1C Test
UNIT 2...The Structure of Atoms and Molecules				
Nov 17	Modern Atomic Theory and the Periodic Table	10.1-10.5	Spectroscopy and Flame Tests	
Nov 24	Modern Atomic Theory and the Periodic Table	10.1-10.5	Magnetism and Atomic Structure	C10 (CA9) Quiz
Dec 1	Modern Atomic Theory and the Periodic Table	10.1-10.5		C10 (CA10A,B) Quiz
Dec 8	Chemical Bonds: The Formation of Compounds from Atoms	10.1-10.5		C10 Test & C11 (CA22) Quiz
Dec 15	Chemical Bonds: The Formation of Compounds from Atoms	11.1-11.10	Molar Shapes and Polarity	C11 (CA21,12) Quiz
Dec 22	Chemical Bonds: The Formation of Compounds from Atoms	11.1-11.10		Unit 2 Test
Dec 29	WINTER BREAK			
Jan 5	Comprehensive Review of Entire Semester			Midterm Exam
UNIT 3...States of Matter				
Jan 12	The Gaseous State of Matter	12.1-12.9		

Tentative Lesson Schedule, Semester II

Week	Lesson Topics	Readings	Laboratory Assessments	Written Assessments
Jan 19	The Gaseous State of Matter	12.1-12.9	Determining the Molar Volume of a Gas	C12 (CA26) Quiz
Jan 26	The Gaseous State of Matter	12.1-12.9		C12 Test
Feb 2	Liquids	13.1-13.7	Toxicity of Road Deicers	C13 (CA24) Quiz
Feb 9	Liquids	13.1-13.7		C13 (CA27) Quiz
Feb 16	Liquids	13.1-13.7		C13 Test
Feb 23	Solutions	14.1-14.6	Designing a Handwarmer	C14 (CA28) Quiz
Mar 2	Solutions	14.1-14.6		C14 (CA29B) Quiz
Mar 9	Solutions	14.1-14.6	Freezing Point Depression	
Mar 16	Solutions	14.1-14.6	Molarity	Unit 3 Test
UNIT 4...The Control of Chemical Reactions				
Mar 23	Acids, Bases, and Salts	15.1-15.8		C15 (CA30A) Quiz
Mar 30	Acids, Bases, and Salts	15.1-15.8	Acid-Base Titration Basics	C15 (CA30B) Quiz
Apr 6	Acids, Bases, and Salts	15.1-15.8	Acid-Base Titration of an Eggshell	C15 (CA32) Quiz
Apr 13	Acids, Bases, and Salts	15.1-15.8		C15 Test
Apr 20	Chemical Equilibrium	16.1-16.8	Introduction to Reaction Rates	C16 (CA23A) Quiz
Apr 27	Chemical Equilibrium	16.1-16.8		C16 (CA23B) Quiz
May 4	Chemical Equilibrium	16.1-16.8	Equilibrium Constant and Temperature	C16 (CA23C) Quiz
May 11	Chemical Equilibrium	16.1-16.8		C16 Test
May 18	Comprehensive Review of Entire Course			Final Exam