

## **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 one-year course is designed to meet the curriculum requirements of Chippewa Valley Technical College's General Chemistry 806-134. THS has an articulation agreement with CVTC that provides transcribed credit for Advanced Chemistry. Thus, this course is considered a CVTC course, as well as a THS course, and you may receive dual credit. Upon successful completion, you will receive one THS credit for Advanced Chemistry and four 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: standards for measurement, elements and compounds, properties of matter, early atomic theory and structure, nomenclature of inorganic compounds, quantitative composition of compounds, chemical equations, calculations from chemical equations, modern atomic theory and the periodic table, chemical bonds, gaseous matter, liquid matter, solutions, acids and bases, salts, 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 Prerequisites.

To be eligible to take this course you should be in grade 11 or 12 AND you should have completed Chemistry and Algebra II with a grade of "B" or better.

## **Course Materials**

### Required Text.

Hein, M. & Arena, S. (2014). *Foundations of College Chemistry*. 14<sup>th</sup> Ed. Hoboken, NJ: John Wiley & Sons, Inc.

### Other Required Items.

School issued Chromebook  
Composition-style notebook  
Scientific Calculator (capable of executing typical mathematical operations, including logarithms, exponential functions, etc. and handling scientific notation)

## **Course Format**

### Direct Interactive Instruction.

This strategic methodology will allow us to outline learning objectives, organize and cover concepts, as well as infuse structured guided and independent practice opportunities. It is highly recommended that you take detailed notes during this time. Use your composition-style notebook for this purpose. Furthermore, it is good academic practice to review all notes for current material daily.

### Daily Coursework.

*Problem Sets.* A list of recommended questions and problems will be assigned and reviewed during each chapter. All students are strongly encouraged to solve all problems. Completing this work will help you think critically and practice your problem solving skills. Use may choose to use your composition-style notebook to complete your homework.

### Laboratory Reports.

*Laboratories.* Laboratories will allow for a hands-on, direct experience of concepts discussed in class. You will gain physical skills (e.g., proper use of laboratory equipment in titrations), as well as communicate procedures, observations, results, and conclusions in words and writing. Furthermore, you will apply experimental techniques to solving chemical problems.

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.

## Tests, Semester/Midterm Exam, and Final Exam.

*Tests.* Tests will be given to cover one to four chapters at a time.

*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.

Per CVTC General Chemistry 806-134 policy, students who do not take their test or exam on the assigned date and period will incur a 10% reduction in their grade for each day. Special consideration may be given if a doctor note is provided.

## **Grading**

Coursework must be turned in on assigned due dates. Late coursework will be issued a 30% deduction.

### THS GRADING

A quarter grade will be determined through a weighted system.

- 35% Laboratory Reports (LAB)
- 65% Tests (TEST)

Per school policy, the semester grade will be determined through the weighted system below and grading scale listed below will be utilized in determining all grades.

#### Semester Grade Weighted System

- 45% Quarter Grade
- 45% Quarter Grade
- 10% Comprehensive Exam

#### Grading Scale

|                 |              |                |               |              |
|-----------------|--------------|----------------|---------------|--------------|
| 100-97 ..... A+ | 89-87.....B+ | 79-77 ..... C+ | 69-67 .....D+ | 59-↓ ..... F |
| 96-93 ..... A   | 86-83.....B  | 76-73 ..... C  | 66-63 .....D  |              |
| 92-90 ..... A-  | 82-80.....B- | 72-70 ..... C- | 62-60 .....D- |              |

Skyward Grading Note: Zeros will appear when coursework has not been handed in. Asterisks will appear when coursework is in the process of being graded.

### CVTC GRADING

A quarter grade will be determined through a weighted system.

- 35% Laboratory Reports (LAB)
- 65% Tests (TEST)

#### Final Grade Weighted System

- 20% Quarter 1 Grade
- 20% Quarter 2 Grade
- 5% Comprehensive Midterm Exam
- 20% Quarter 3 Grade
- 20% Quarter 4 Grade
- 15% Comprehensive Final Exam

## **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.

## **Academic Integrity**

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. Depending on the severity of the infraction, consequences will include loss of credit/failure of assignment or failing grade for the course.

## Tentative Lesson Schedule, Semester I

| Week   | Lesson Topics  | Readings          | Laboratories  | Assessments                             |
|--|--|-------------------|---|---|
| <b>UNIT 1...Laboratory Safety and Procedures</b>                                   |  |                   |   |   |
| Aug 25 (1 period week)   | Chemistry Exam   |                   |   |   |
| <b>UNIT 2...Basic Tools of Chemistry: Matter, Measurement, Atoms, and Elements</b> |  |                   |   |   |
| Aug 28   | Laboratory Safety, Intro to Chemistry, & Standards for Measurement | 1.1-1.4 & 2.1-2.8 |   |   |
| Sep 5 (4 period week)  | Standards for Measurement  | 2.1-2.8           | Identification of an Unknown Based on Physical Properties: What Type of Solution Is the Unknown Liquid?                                 | ADI Lab                                 |
| Sep 11   | Elements and Compounds & Properties of Matter                      | 3.1-3.3 & 4.1-4.6 |   |   |
| Sep 18   | Properties of Matter   | 4.1-4.6           | Classification of Changes in Matter: Which Changes Are Examples of a Chemical Change and Which Are Examples of a Physical Change?       | ADI Lab<br>Ch 1-4 Test                  |
| <b>UNIT 3...Basic Tools of Chemistry: Molecules, Ions, and Their Compounds</b>     |  |                   |   |   |
| Sep 25   | Early Atomic Theory and Structure                                  | 5.1-5.6           |   |   |
| Oct 2 (4 period week)  | Nomenclature of Ionic Compounds                                    | 6.1-6.5           |   | Ch 5-6 Test                             |
| <b>UNIT 4...Basic Tools of Chemistry: Chemical Equations and Stoichiometry</b>     |  |                   |   |   |
| Oct 9  | Quantitative Composition of Compounds                              | 7.1-7.5           | Molar Relationships: What are the Identities of the Unknown Compounds?  | ADI Lab                                 |
| Oct 16   | Chemical Equations   | 8.1-8.5           |   |   |
| Oct 23   | Chemical Equations   | 8.1-8.5           | Designing a Cold Pack: Which Salt Should Be Used to Make an Effective but Economical Cold Pack?   | ADI Lab                                 |
| Oct 30   | Calculations from Chemical Equations                               | 9.1-9.5           |   |   |
| Nov 6  | Calculations from Chemical Equations                               | 9.1-9.5           | Stoichiometry and Chemical Reactions: Which Balanced Chemical Equation Best Represents the Thermal Decomposition of Sodium Bicarbonate? | ADI Lab                                 |
| Nov 13   | Calculations from Chemical Equations                               | 9.1-9.5           |   | Ch 7-9 Test                             |
| <b>UNIT 5...The Structure of Atoms and Molecules</b>                               |  |                   |   |   |
| Nov 20 (2 period week)   | Modern Atomic Theory and the Periodic Table                        | 10.1-10.5         |   |   |
| Nov 27   | Modern Atomic Theory and the Periodic Table                        | 10.1-10.5         | Magnetism and Atomic Structure: What Relationships Exist Between the Electrons in a Substance and the Strength of Magnetic Attraction?  | ADI Lab                                 |
| Dec 4  | Chemical Bonds: The Formation of Compounds from Atoms              | 11.1-11.10        |   | Ch 10-11 Test                           |
| Dec 11   | The Gaseous State of Matter  | 12.1-12.9         |   |   |
| Dec 18 (4 ½ period week)   | The Gaseous State of Matter  | 12.1-12.9         | Redox Ornament Making   |   |
| Dec 26   | <i>WINTER BREAK</i>  |                   |   |   |
| <b>UNIT 6...States of Matter</b>   |  |                   |   |   |
| Jan 3 (3 period week)  |  |                   |   | Ch 1-12<br>SEMESTER/<br>MIDTERM<br>EXAM |
| Jan 8 (4 period week)  | Liquids  | 13.1-13.7         |   |   |

**Tentative Lesson Schedule, Semester II**

| Week   | Lesson Topics                         | Readings  | Laboratories  | Major Assessments  |
|--|---------------------------------------|-----------|---|--------------------|
| Jan 15   | Liquids                               | 13.1-13.7 |   |                    |
| Jan 22   | Liquids                               | 13.1-13.7 | Melting and Freezing Points: Why Do Substances Have Specific Melting and Freezing Points?   | ADI LAB            |
| Jan 29   | Solutions                             | 14.1-14.6 |   |                    |
| Feb 5 (4 period week)                              | Solutions                             | 14.1-14.6 |   |                    |
| Feb 12   | Solutions                             | 14.1-14.6 |   |                    |
| Feb 19 (4 period week)                             |                                       |           |   | Ch 12-14 Test      |
| <b>UNIT 7... The Control of Chemical Reactions</b> |                                       |           |   |                    |
| Feb 26   | Acids, Bases, and Salts               | 15.1-15.8 |   |                    |
| Mar 5  | Acids, Bases, and Salts               | 15.1-15.8 | Acid-Base Titration and Neutralization Reactions: What Is the Concentration of Acetic Acid In Each Sample of Vinegar?                             | ADI Lab            |
| Mar 12   | Acids, Bases, and Salts               | 15.1-15.8 |   | Ch 15 Test         |
| Mar 19   | Chemical Equilibrium                  | 16.1-16.8 |   |                    |
| Mar 26   | <i>SPRING BREAK</i>                   |           |   |                    |
| Apr 3 (4 period week)                              | Chemical Equilibrium                  | 16.1-16.8 | Equilibrium Constant and Temperature: How Does the Change In Temperature Affect the Value of the Equilibrium Constant for an Exothermic Reaction? | ADI LAB            |
| Apr 9  | Chemical Equilibrium                  | 16.1-16.8 |   | Ch 16 Test         |
| Apr 16 (4 ½ period week)                           | Oxidation-Reduction                   | 17.1-17.5 |   |                    |
| Apr 23   | Oxidation-Reduction                   | 17.1-17.5 |   |                    |
| Apr 30   | Oxidation-Reduction                   | 17.1-17.5 | Electrochemical Cells   | Ch 17 Test         |
| May 7  | Comprehensive Review of Entire Course |           |   | Ch 1-17 FINAL EXAM |