

**Utica High School
Advanced Chemistry 2**



Instructor: Jeremy Krausz

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Office Hours: Mornings before school 6:45 – 7:15 in room 206 or by appointment

Course Description: This course is designed for students who plan to pursue a career in science, engineering or a medical field. Emphasis is placed on a theoretical, practice, and quantitative approach to chemistry principles with extensive laboratory experimentation. Topics include atomic, kinetic, and acid base theory, thermo chemistry, chemical equilibria, electro-chemistry, and chemical thermodynamics.

Materials needed: Students MUST have all materials, including textbook and iPads, in class every day. Students must have a scientific calculator, a 3-ring binder and paper with sections for notes, labs, and homework/classwork, a pencil, pen, and colored pen. Classwork and homework may only be completed in black or blue ink or pencil.

Grading Scale:

- 90 – 100 = A
- 80 – 89 = B
- 70 – 79 = C
- 60 – 69 = D
- 0 – 59 = F

Grade Weights:

- Tests – 50%
- Quizzes – 15%
- Labs Classwork/Homework – 35%

Major Course Projects and Instructional Activities:

Tests: Test will be given at the end of a unit and represent student knowledge for the topic. There will be 3 or 4 test given per 9 week period.

Quizzes: Quizzes are given frequently over the course content. They often fall in the middle of a unit to check for student understanding.

Labs: Major laboratory experience will include a written lab report that represents students understanding of the lab and the data collected during the lab.

Daily Classwork and Homework: Short assignments done in class and daily homework assignments completed outside of class.

At the end of the 1st 9-weeks, the 9 weeks average will count towards 20% of the grade, and the midterm and final exams counting for the remaining 20% (10% each). The average of four 9-weeks grades will count for 80% of the final course grade and the midterm and final will count for the remaining 20% of the final grade.

Denial of Credit Policy for Full-Year Course:

DENIAL OF CREDIT due to absence

Any student who accrues non-professional absences in excess of four (4) days in a nine week period will be subject to receive zeroes on assignments for every additional day of non-professional absence for the remainder of the 9 weeks for each class that this takes place. Each new nine weeks every student will begin with a clean slate with regard to period attendance. Denial of credits can be appealed in writing only to the building principal.

Class Participation

What you put into this class will be what you get out. Active participation is essential in Chemistry. This class is not meant to be observation. You will be given many opportunities to participate in class discussions, activities, and labs. Your grade will reflect poor participation. Remember, poor participation includes not paying attention to discussions, lectures, or instructions; sleeping; talking; and being generally disruptive.

Test Retakes

Students may retake tests for a maximum score of 80%. Retake will be done during study hall, before/after school, or academic assist. You may only retake one exam per unit of study. **If a test is assigned during remote learning there will not be a retake.**

Classroom Policies:

- ♦ **Everyone is expected to be in their seats preparing to start class before the tardy bell rings.** When the bell rings, students should complete daily bell work in their folders. Homework and other assignments will be due shortly after the bell.
- ♦ **Mutual respect is required at all times.** Everyone's opinions and contributions in class are welcomed. When someone else is talking you must be courteous.
- ♦ **Come to class prepared with all your materials.** You will need to bring your note- book , iPad, textbook and calculator to class everyday.
- ♦ **All students will wait for specific instructions before entering the lab.** No student should use the sinks, gas jets, safety shower or emergency eye wash unless you have permission from the instructor.
- ♦ **Safety rules must be followed at ALL times.** The rules are in place to ensure that every student in the room is as safe as possible in all situations.

Absences/Missed Assignments, Quizzes, Tests:

It is your responsibility to make up any missed work not exceeding one day more than the period of absence. Check the class website. Come see me when you miss a day. I will point you towards anything you missed. If there were any additional notes that were not part of a handout, you are responsible for getting them from a partner. You will also need to get with someone in the class who can give you an overview of the class you missed. You are responsible for keeping up with these things during non-instruction time. **IF YOU MISS A DAY, IT IS YOUR RESPONSIBILITY TO GET CAUGHT UP!**

If you are absent for a quiz or test day, you are expected to take the test/quiz on the day you return to class. Be prepared.

The majority of the work in this course is cumulative. Therefore, keeping up with **your** work will help to insure **your** success.

Recommended/Required Readings: Students are encouraged and may be required to read articles from current science journals and magazines.

Course Calendar / Pacing

Chapter	Main Topics
Foundations	<ul style="list-style-type: none">• Scientific Method / Inquiry• Measurement• Significant Figures• Dimensional Analysis• Classification of Matter
Atoms, Ions, Molecules	<ul style="list-style-type: none">• Atoms and Atomic Structure• Molecules• Ions• Periodic Table• Nomenclature and Formulas
Stoichiometry	<ul style="list-style-type: none">• Moles and Molar Mass• Percent Composition• Empirical Formulas• Balanced Equations• Stoichiometric Calculations• Percent Yield
Reaction Types and Solution Stoichiometry	<ul style="list-style-type: none">• Water• Solutions• Precipitation Reactions• Acid - Base Reactions

	<ul style="list-style-type: none"> • Oxidation Reduction Reaction
Gases	<ul style="list-style-type: none"> • 3 Gas Laws and Combined • Ideal Gas Law • Gas Stoichiometry • Dalton's Law • Effusion and Diffusion • Real Gases
Thermochemistry	<ul style="list-style-type: none"> • Energy • Enthalpy and Calorimetry • Hess' Law • Standard Enthalpies of Formation • Sources of Energy
Atomic Structure Periodicity	<ul style="list-style-type: none"> • Electromagnetic Radiation • Atomic Models • Orbitals • Quantum Mechanics • Aufbau, Pauli, Hund • Periodic Trends

Organic	<ul style="list-style-type: none"> • Hydrocarbons • Functional Groups • Isomers • Polymers • Reactions
Bonding	<ul style="list-style-type: none"> • Types of Bonds • Electronegativity • Ionic Bonds • Covalent Bonds • Metallic Bonds • Lewis Structures • VSEPR Model • Hybridization • Bonding Models
Liquids and Solids	<ul style="list-style-type: none"> • Intermolecular Forces • Structure of Solids • Structure of Metals • Network Atomic Solids • Molecular Solids • Ionic Solids • Vapor Pressure • Phase Diagrams
Solutions	<ul style="list-style-type: none"> • Types of Solutions • Solubility Factors • Concentration • Colligative Properties • Colloids
Kinetics	<ul style="list-style-type: none"> • Intro Rate Laws • Reaction Rates-Factors • Rate Laws • Integrated Rate Law • Reaction Mechanisms • Catalysis

Equilibrium	<ul style="list-style-type: none"> • The Equilibrium Condition • Equilibrium Constant • Equilibrium and Pressure • Heterogeneous Equilibria • Applications of the Equilibrium Constant • Solving Equilibrium Problems • Le Chatlier's Principle
Acids and Bases	<ul style="list-style-type: none"> • Acid-Base Theories • Conjugate Pairs • Concept of pH • Calculations of Strong Acids and Bases • Weak Acids and Bases • Polyprotic Acids
Applications of Aqueous Equilibria	<ul style="list-style-type: none"> • Acid-Base Equilibria • Acid-Base with Common Ions • Buffers • Titrations and pH Curves • pH indicators • Solubility Equilibria • Solubility Product • Selective Precipitation • Qualitative Analysis
Spontaneity, Entropy, and Free Energy	<ul style="list-style-type: none"> • Spontaneity • Entropy • Effect of Temperature • Free Energy • Entropy Changes in Reactions • Free Energy and Pressure • Free Energy and Equilibrium • Free Energy and Work

Electrochemistry	<ul style="list-style-type: none"> • Galvanic Cells • Standard Reduction Potentials • Cell Potential • Concentration Cells • Batteries • Corrosion • Electrolysis