

---

**Chemistry 2 (Online)**

**Time:** Tuesdays, 7:00 - 7:45 p.m. ET

**Teacher:** Elena Zakharova

**Contact Information:**

- Email: zakharova@schoolnova.org
- Phone: 801-864-5346

**Course Materials:**

This class uses materials from the following books:

- A. Auerbach and R. Cador, *Max the Demon vs. Entropy of Doom*
- Manyuilov and Rodionov, *Chemistry for Children and Adults*
- Steve Owen, *Chemistry for the IB Diploma*
- K. C. Timberlake, *General, Organic, and Biological Chemistry: Structures of Life*

**Course Content:**

The course is structured as follows:

- Thermodynamics, including entropy, enthalpy changes, and heat capacity
- Chemical kinetics, covering collision theory, reaction rates, factors affecting reaction rates, and chemical equilibrium
- Organic chemistry, including alkanes, alkenes, alkynes, aromatic compounds, alcohols, carboxylic acids, amines, and organic functional group interconversions
- Amino acids
- Proteins
- Nucleic acids
- Carbohydrates and lipids

**Major Learning Objectives:**

Understand the concept of entropy

- Differentiate between heat and temperature, explain exothermic and endothermic reactions, and calculate enthalpy changes from experimental data. Understand Hess's Law, standard enthalpy change of formation, and bond enthalpy, and use these concepts to calculate enthalpy changes.
- Understand the rate of chemical reactions, describe experimental methods for measuring rates, and analyze numerical and graphical data from rate experiments.
- Describe collision theory, define activation energy, and understand the effects of surface area, temperature, catalysts, and concentration on reaction rates.

- Understand that a reversible reaction can reach a state of equilibrium, comprehend the position of equilibrium, and apply Le Chatelier's Principle.
- Identify characteristic properties of organic compounds.
- Draw structural formulas for alkanes, alkenes, alcohols, and carboxylic acids. Be familiar with the main chemical reactions of organic compounds, including addition reactions of alkenes (halogenation, hydrogenation, hydration, hydrohalogenation, polymerization) and substitution reactions of benzene.
- Learn about amino acids and understand peptide formation.
- Describe the primary, secondary, and tertiary structures of proteins.

### **Classwork and Homework:**

- All announcements, classwork, and homework assignments will be posted in Google Classroom.
- **Homework is mandatory.** You are required to submit your homework in Google Classroom. Please ensure you have your homework available during class meetings.

### **How to Submit Homework:** You have several options:

- If you take handwritten notes, please write clearly, take a picture of your notes, and upload them to Google Classroom.
- If you type your answers, upload your documents or PDF files.
- Do **not** use the Kami app.