Jefferson County High School
Course Syllabus

A. Course Chemistry II

B. Department Science

C. Course Description

Chemistry II is an accelerated course designed for students with a strong background in both science and math. The curriculum will include chemical kinetics, thermochemistry, chemical equilibrium, oxidation – reduction reactions, acids and bases, and solutions. This course will include extended reading assignments, research-based reports, problem solving experiences and laboratory experiments.

D. Grade Term Semester

E. Grading Scale

Range		Honors/ Regular	College-Level	A.P.
93-100	A	4.0	4.5	5.0
85-92	B	3.0	3.5	4.0
75-84	C	2.0	2.5	3.0
70-74	D	1.0	1.5	2.0

F. Term Dates

a. 1st 9 Weeks August 5, 2016 – October 7, 2016
b. 2nd 9 Weeks October 8, 2016 – December 16, 2016
c. 3rd 9 Weeks January 5, 2017 – March 15, 2017
d. 4th 9 Weeks March 16, 2017 – May 25, 2017

G. Textbook Chemistry: Matter and Change – Glencoe Science

H. Other Required Reading

None

I. Other Resources

a. Odysseyware

J. Major Assignments

None

K. Procedures for Parental Access to Instructional Materials

a. Aspen Parent Portal
b. Instructor's Website

c. Email Instructor
d. Parent Teacher Conference
    a. There are two designated conference dates during the school year. Parents who would like to request additional meetings may make appointments for conferences with the teachers (during their planning periods), counselors, or a principal by telephoning the school office.

L. Field Trips

a. Any scheduled fieldtrip will have a definite educational purpose and will reflect careful planning. Signed permission forms will be obtained when an off campus trip is planned.

M. Standards & Objectives

First Nine Weeks

Standard 2 – States of Matter

CLE 3224.1 Explain the kinetic-molecular theory.

I can correlate the kinetic-molecular theory with the motion of particles within a substance.

I can explain the effect of heat on temperature in terms of the motion of the particles within the substance.

I can explain how the motion of gas molecules affects the pressure.

I can explain the effects of temperature changes on the pressure of a gas.

I can explain the effects of pressure changes on the volume of a gas.

I can solve complex combined and ideal gas law problems to quantitatively explain the behavior of gases.

I can determine the rates of effusion of gas molecules using Graham's Law of Effusion.

I can describe conditions that cause real gases to deviate from their ideal behavior.

CLE 3224.2 Determine the intermolecular forces that exist between ions and molecules.

I can determine the types of intermolecular interactions that occur in a pure substance or between the components of a mixture.

I can compare the strengths of intermolecular forces between ions, molecules, and ion-molecule mixtures.

CLE 3224.3 Explain how the physical characteristics of matter are governed by kinetic molecular theory and intermolecular forces.

I can correlate the strength of intermolecular force with the viscosity, surface tension and physical state of the substance at a given temperature.

I can explain the role of intermolecular forces in determining the vapor pressure, volatility and boiling point of a substance.

I can use a phase diagram to identify the tripe-point, critical temperature, and pressure of a substance.

I can apply a phase diagram to interpret the effects of temperature and pressure on the phase of a substance.

I can calculate the freezing point depression and boiling point elevation of a solution based on appropriate constants, quantities of solute and solvent, and type of solute.

Standard 3 - Reactions

CLE 3224.3.1 Use the reactants of a chemical reaction to predict the products.

I can apply an activity series to predict products and write net ionic reactions that identify spectator ions.

I can use a solubility chart to predict products and write net ionic reactions that identify spectator ions in a double-replacement reaction.

CLE 3224.3.3 Analyze the kinetics of a chemical reaction.

I can calculate the rate of a chemical reaction based on elapsed time and amount of remaining reactant or product.

I can use the rate law and rate of reaction to calculate and interpret the rate constant of a chemical reaction.

I can calculate and interpret the reaction order based on the rate constant and concentration of reactants or products at various times during the reaction.

I can draw energy profiles for catalyzed and uncatalyzed chemical reactions in terms of activation energy.

Second Nine Weeks

CLE 3224.3.5 Explain the thermodynamics of a chemical reaction.

I can apply thermodynamic data to calculate the change in enthalpy, entropy, and Gibb's free energy of a chemical reaction.

I can interpret the magnitude of the enthalpy and entropy change of a chemical reaction in terms of heat changes and order of the reaction components.

I can interpret the magnitude of free energy change in terms of spontaneity of the chemical reaction.

CLE 3224.3.2 Fully analyze the quantitative aspects of a chemical reaction in terms of the amounts of products and reactants.

I can identify the oxidation states of ions in an oxidation-reduction reaction.

I can balance an oxidation-reduction reaction.

I can use reduction potentials to determine the anode and cathode reactions in an electrochemical cell, and calculate its standard reduction potential.

I can apply reduction potentials to identify oxidizing and reducing agents and determine their relative strengths.

CLE 3224.3.4 Describe parameters of chemical equilibria.

I can write and equilibrium expression and calculate the equilibrium constant based on the concentration of reactants and products at equilibrium.

I can interpret the magnitude of the equilibrium constant to determine equilibrium concentrations and direction of a chemical reaction that has yet to reach equilibrium.

I can apply LeChatelier's Principle to predict shifts in the direction of a chemical reaction in response to changes in temperature, pressure and concentration of reactants or products.

I can characterize the strength of acids and bases by exploring their chemical structures.

I can calculate the solubility product constant based on the concentration of soluble ions.

I can interpret the magnitude of the solubility product constant in terms of the solubility of the substance.