THE FOLLOWING SCHEDULE IS SUBJECT TO CHANGE AT THE TEACHER'S DISCRETION

Semester II Q3

MODULE VI Reaction Rates and Equilibrium

1. **Factors Affecting Reaction Rates** ***Chem 8a, 8b, 8c, 8d, 9a, 9b***
   The effect of temperature, pressure, surface area and concentration on reaction rates. Catalysts and their effects. Le Chatelier's Principle.

2. **Direction of Reactions** ***Chem 9b***
   Reversible reactions. Shifting equilibrium positions.

3. **Equilibrium Constants** ***Chem 9c***
   The K_{eq} and how it determines if a reaction will "go."

4. ***LAB 11: Factors Affecting Reaction Rates***

5. ***QUIZ 15: Equilibrium and Rates of Reaction***

MODULE VII Heat Energy In Reactions

1. **Endothermic & Exothermic Reactions** ***Chem 7a, 7b, 7c***
   Plotting the flow of ENERGY in reactions. Spontaneous reactions. Activation energy—when reactions need a "kickstart."

2. **Calculating Heat Transfer** ***Chem 7d, 7e***
   How different substances require different amounts of energy to change temperature. Thermal Expansion. Measuring energy—the CALORIE & the JOULE. Calorimetry. Enthalpy. Heats of formation and Hess' Law.

3. ***LAB 12: Calculating Food Calories Through Calorimetry***

4. ***QUIZ 16: Energy in Reactions***

MODULE VIII A Detailed Look at Acids & Bases

1. **Physical Properties of Acids & Bases.** ***Chem 5a***
   Identifying features of Acids. Common acids. Features of Bases. Common Bases. Neutralization Reactions.

2. **The pH Scale.** ***Chem 5d, 5f***
   Identifying acids & bases by their pH. Equilibrium constants and pH. Common pH Indicators. Titration.

3. ***LAB 13: Indicators***

4. **Defining Acids & Bases** ***Chem 5b, 5c, 5e, 5g***
   Dissociation. Weak vs. Strong acids & bases. Brønsted-Lowry, Lewis, Arrhenius definitions. An introduction to Buffers.

3. ***LAB 14: Titration***

5. ***QUIZ 17: Acids & Bases***

MODULE IX The Chemistry Of Life

1. **Organic Molecules** ***Chem 10b, 10d***
   The importance of Carbon in Living Systems. Carbon bonds and simple carbon based molecules.

2. **Polymers** ***Chem 10a, 10b, 10c***
   How simple molecules can build repeating patterns. Monomers found in life and the Polymers they create. Amino Acids and Proteins. Fatty Acids and Fats. Sugars and Carbohydrates.

3. ***LAB 15: Polymers***

4. **DNA** ***Chem 10b, 10e***
   The structure and function of DNA. Related nucleic acids.

5. ***QUIZ 18: Organic Molecules & Polymers***

MODULE X Testing Your Skills

The instructor will formulate a scenario that requires your team's general knowledge of chemistry. This will be a lab-based module that will incorporate research and computer technologies.

FINAL REVIEW

FINAL EXAM