Tamanawis Secondary
Chemistry 12
Course Outline

1. **Getting Started**
   a) Safety
   b) Review of Chem 11

2. **Reaction Kinetics**
   a) Measuring the Rate of a reaction
   b) Factors affecting reaction rates
   c) Collision theory
   d) Total energy= Kinetic energy + potential energy
   e) Activation energy, ΔH, Potential energy diagrams
   f) Reaction mechanisms
   g) Catalysis
   h) Unit Test

3. **Equilibrium**
   a) Reversibility of reactions
   b) Dynamic equilibrium
   c) characteristics of equilibrium
   d) Entropy and enthalpy considerations
   e) Factors affecting equilibrium
   f) Le chatlier's principle
   g) Mathematical relationships at equilibrium
   h) Equilibrium constant expressions
   i) Interpreting K values
   j) Dependence of K on T
   k) Mathematical applications of K
   l) Equilibrium Applications
   m) Unit test

4. **Solubility of Ionic Substances**
   a) Concept of solubility
   b) Equilibrium of a saturated aqueous solution
   c) Solubility and precipitation
   d) Predicting whether precipitates will form
   e) Developing a qualitative analysis scheme
   f) Quantitative aspects of solubility equilibrium
   g) Predicting changes in solubility on the addition of a common ion
   h) Unit test

5. **Acids, Bases and Salts**
   a) General properties of Acids and Bases
   b) Definitions of acids and bases
   c) Conjugate acid/base pairs
   d) Strong and weak acids and bases
   e) Amphiprotic substances
   f) K_w, pH, pOH
   g) K_a and K_b problem solving
   h) Hydrolysis of salts
   i) Indicators
   j) Neutralization of acids and bases
   k) Buffer chemistry
   l) Applications of acid/base chemistry
   m) Unit test

6. **Oxidation-Reduction**
   a) Definitions
   b) Developing a reactivity series of half reactions
   c) Predicting spontaneity and balancing half reactions
   d) Oxidation numbers
   e) Balancing redox equations by oxidation number or half cell method
   f) Redox titrations
   g) Electrochemical cells
   h) Applications of electrochemical cell concepts
   i) Electrolytic cells and non-spontaneous redox reactions
   j) Applications of electrolytic cells
   k) Redox applications
   l) Unit test

In addition to the unit tests there will also be two cumulative Tests

Evaluation:

1) Class Work represents 75% of your final grade.

Tests	55%
Quizzes	15%
Labs and Assignments	25%
Homework	5%

2) An in-class Final represents 25% of your final grade.

Keys to Success in Chemistry 12:

The following excerpt from your textbook <u>Chemistry 12: A workbook for Students </u>by Hebden sums up how to be successful perfectly.

In order to be successful in Chemistry 12, you should be prepared for the following.

a) Chemistry 12 expects you to have a much deeper understanding of the material than you might have been able to get away with in Chemistry 11. There is much less in Chemistry 12 which is straight memorization; you are expected to think deeply about many topics. Rather than simply memorizing notes, you will be dealing with questions which ask you to APPLY your knowledge to new situations.

b) Chemistry 12 has a substantial emphasis on applying mathematics to problem situations. If you love math you are going to LOVE this course (but it you never did like math then ......). It will be virtually impossible to simply memorize all the types of problems you could be asked. Instead, you will be shown how to analyze problems and modify procedures according to the information given.

Chemistry 12 often serves as a prerequisite to further studies in the sciences at the college or university level. Chemistry is not an easy subject to master, but your studies should repay your efforts handsomely. Many other fields besides Chemistry require a sound chemistry background, including engineering, medicine, animal health technology, art restoration, forensics, biology, environmental studies, and so on. I hope you find your work this year to be personally rewarding; Chemistry is a fascinating subject.

What You Should Bring to Every Class:

- Course Textbook
- Pens (blue & red) and pencils
- Ruler, eraser and whiteout

- 3- ring binder with paper and dividers
- graph paper
- scientific calculator