**Electrochemistry Unit Outline**

1. Define the terms oxidation, reduction, oxidizing agent, reducing agent, oxidation state, oxidation number and redox reaction, voltage, electrolyte, salt bridge, spontaneous and nonspontaneous electrochemical change.

2. Describe the significance of the activity series as it relates to oxidation / reduction.

3. Rank oxidizing and reducing agents in order of their strength given a table of standard reduction potentials.

4. Write half reactions and balance redox reactions.

5. Assemble electrochemical cells (a.k.a voltaic cells), measure their voltages and identify and draw all aspects of the cell (anode, cathode, electron flow, salt bridge and half cell reactions at the eletrodes etc.. - 8 steps)

6. Given the two half cell reactions, use standard reduction potentials to predict the spontaneity of the redox reaction, write the overall equation for the reaction and determine the total potential difference of the cell (a.k.a. voltage or electromotive force).

7. Describe some commercial uses for electrochemical cells.

8. Solve stoichiometric calculations dealing with redox reactions.

9. Balance redox reactions in acidic / basic solutions using the half reaction method (a.k.a. ion electron method).

10. Know and use the rules for determining the oxidation number of an element in a compound or a complex ion.

11. Balance redox equations using oxidation numbers.

12. List the conditions necessary for corrosion to occur and explain how corrosion can be minimized.

13. Differentiate between an electrochemical cell and an electrolytic cell.

14. Assemble an electrolytic cell, label all parts of the cell and describe the chemical reactions that are occuring.

15. Estimate the minimum voltage needed to perform various electroplating experiments.

16. Define Faraday's law and use this concept to solve calculations using these two equations q = I x t and ne = I x t / F.

17.Describe commercial applications of electrolysis.

18.List some of the redox reactions which play a role in everyday life. Report on the industrial benefits of, and societal concerns about redox chemical processes.