To satisfy the minimum requirements for this course, you should be able to:

1. Discuss the general properties of Brønsted acids and bases by
   - identifying Brønsted-Lowry acids and bases.
   - identifying the conjugate base associated with a given Brønsted acid.
   - identifying the conjugate acid associated with a given Brønsted base.

2. Explain what is meant by the autoionization of water and write the $K_w$ expression for the process.

3. Define $\text{pH}$, $\text{pOH}$, $[\text{H}^+]$, and $[\text{OH}^-]$ and given one variable, be able to calculate the other three variables.

4. Explain the difference between weak and strong acids/bases and
   - be able to give the names and formulas of common strong acids and bases. (see Chemistry Reference Sheet)
   - calculate the pH of aqueous solutions of strong acids and strong bases given their concentrations.
   - write chemical equations to show how amines act as weak bases and how carboxylic acids act as weak acids in aqueous solution.
   - rank a series of weak acids or weak bases by acid or base strength given their $K_a$ or $K_b$ values.

5. Determine the relationship between the strength of an acid and that of its conjugate base and be able to calculate $K_b$ using a given $K_a$ and vice-versa.

6. Generate an ICE table and:
   - calculate the pH for a weak acid solution in water, given the initial acid concentration and $K_a$.
   - calculate $K_a$ given the initial acid concentration and pH.
   - calculate the pH for a weak base solution in water, given the initial base concentration and $K_b$.
   - calculate $K_b$ given the initial base concentration and pH.

7. Write stepwise ionization equations and the corresponding equilibrium-constant expressions for polyprotic acids.

8. Predict whether a salt solution will be acidic, basic, or neutral and be able to calculate its pH.

9. Use molecular structure to determine the relative acid strength of
   - hydrogen halides
   - oxoacids

10. NavApp: Boiler Water
    - understand the effect of varying pH on corrosion
    - Note: This NavApp is covered, for the most part, in Experiment 14