

After completing CHEM 220, students will be able to:

- Write rate laws and determine rate order.
- Draw qualitative energy diagrams to represent activation energy.
- Predict reaction mechanism.
- Define chemical equilibrium and perform calculations using equilibrium constants.
- Describe acid-base equilibrium reactions.
- Apply  $K_a$ ,  $K_b$ ,  $pK_a$ ,  $pK_b$ , and pH concepts on complex equilibrium calculations.
- Create acid-base titration curves.
- Describe the behavior of buffers.
- Predict precipitation reactions from solubility product constant data.
- Describe enthalpy, entropy and free energy as it applies to spontaneous processes.
- Balance redox reactions.
- Construct simple voltaic cells and perform calculations involving reduction potentials.
- Describe the chemistry of the main group elements and of the transition elements.
- Use the band of stability to predict radioactive decay.
- Identify some applications of nuclear chemistry.