

## CH/CHE/CHEM 223Z General Chemistry III

For more detailed information, see CCN Reports & Memos on the [Educator Resources—Common Course Numbering](#) webpage.

### CCN Course/Course Information

#### Chemistry

**Course Number and Prefix:** CH/CHE/CHEM 223Z

**Course Title:** General Chemistry III

**Course Credits:** 5 for lecture and lab. (Institutions will divide these credits between lecture and lab so that the total credits for both courses equals 5 credits.)

**Course Description:** Builds upon the principles presented in CH/CHE/CHEM 222Z, explores thermodynamics and chemical equilibrium, and applies them to the study of aqueous acid-base reactions, solubility, and electrochemistry. CH/CHE/CHEM 223Z is a lecture course; CH/CHE/CHEM 229Z is the laboratory component.

#### Course Learning Outcomes:

Students will be able to

1. Apply concepts of thermodynamics to explain the favorability of chemical reactions.
2. Apply the principles of spontaneity, entropy, free energy, and the laws of thermodynamics to predict and rationalize the behavior of chemical reactions.
3. Interpret the behavior and relative strengths of acids and bases, buffers, and the hydrolysis of salts.
4. Analyze and evaluate equilibrium reactions including solubility, acids and bases, and other equilibria.
5. Predict responses of various chemical systems to changing conditions using equilibrium calculations and Le Chatelier's Principle.
6. Use redox reactions and electrochemical principles to determine cell potentials and to analyze the relationship between voltage, free energy, and equilibrium.
7. Identify or formulate and apply the appropriate equations related to electrochemistry, thermodynamics, equilibrium reactions, acids, bases, and buffers.

#### Teachout Recommendation:

The committee recommends that the 2025-2026 academic year be designated as a teachout year for students that began the general chemistry series prior to Fall 2025. As the topics in the newly aligned CH/CHE/CHEM 221Z/227Z, 222Z/228Z, 223Z/229Z differ from those taught in the unaligned courses, students could miss topics by switching mid series. Several institutions currently offer delayed “trailer” sections of each course. This proposed teachout would facilitate completion of the sequence by students already on that schedule.

All schools should be allowed to offer the pre-Z CH 222 and CH 223 alongside the CCN aligned courses for the **first** academic year of offering the newly aligned courses. This minimizes the negative impact on students who need to finish the series if they completed CH 221 before Fall 2025. CH 221 (pre-Z) does not need to be included in the teachout plan as students entering the series would begin in CH/CHE/CHEM 221Z and CH/CHE/CHEM 227Z in the Fall of 2025.

