

# CH 221 : GENERAL CHEMISTRY I

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## Transcript title

General Chemistry I

## Credits

5

## Grade mode

Standard letter grades

## Contact hours total

70

## Lecture hours

40

## Lab hours

30

## Prerequisites

MTH 111, 112, 113, or 251 or higher, or minimum placement into MTH 112.

## Description

Explores experimental and theoretical principles of chemistry including matter, measurement, atomic structure, periodicity, stoichiometry, solutions, molecular structure, bonding, oxidation/reduction and thermochemistry. The course is algebra-based and includes supporting laboratory work. This course is appropriate for science and engineering majors. High school chemistry is recommended.

## Learning outcomes

1. Interpret and communicate results of chemistry experiments in scientific terms with an emphasis on the precision, accuracy, and shorthand notations generally accepted by the discipline of chemistry. Locate and critically evaluate the results of the chemical investigations of others from the primary literature.
2. Show, in writing, their reasoning and methods for successfully performing the following linear conversions: time, length, area, volume, density, mass, moles, energy, and solution concentration. These conversions may be from English or metric units and may be related by moles via a chemical equation. Interpret these same efforts of another student or scientist.
3. Given the chemical formulas for reagents and products, predict the amounts of each involved in the reaction by balancing the appropriate resulting chemical equation. Interpret equations to predict the observable properties of the system and quantities of compounds that will be consumed or produced.
4. Using a Periodic table, estimate the relative intensity of the following characteristics based exclusively on the name or the formula for a given compound or element: ionic size, atomic size, ionization potential, electron affinity, electronegativity. Classify a compound as ionic, covalent, acid, base, given either the name or the chemical formula for that compound.

5. Given the chemical formulas for a compound, predict whether it is molecular, ionic or metallic. Produce and interpret an appropriate structural model of the compound based on the Lewis system.
6. Predict and/or interpret the experimental results of an experiment based on a given model. By taking into account the precision limitations of the experimental set up, make appropriate suggestions for improving the accuracy of the results.
7. Interpret and follow written instructions to reach a successful outcome. This may involve periodic self- assessment of progress toward the goal, or external checks of effectiveness and a change of approach appropriate to that information to ensure success.
8. Perform laboratory work safely, accurately, and cooperatively, in a timely fashion with a partner. Operate traditional laboratory equipment responsibly and reliably to generate reasonable experimental results. Prepare and submit reports of laboratory experiments that reflect the accuracy, precision, methodology, and interpretation of those results using language, voice and notation appropriate for the discipline.
9. Demonstrate cooperative and collaborative skills essential for working for authorities both alone and in groups on scientific problems. Qualities indicative of a good team member are promptness, reliability, thoroughness, topical focus, personal responsibility, ethical behavior, collegial treatment of differing views, and the ability to resolve personal differences in a constructive way.

## General education/Related instruction lists

- Discipline Studies/Science Lab