

## Science (CHEM)

### **CHEM133 General Chemistry I with Lab (4 semester hours)**

This is the first course of a two-course general chemistry sequence that introduces students to the principles, terminology, methodology, and worldview of chemistry. Lecture and lab topics are both descriptive and mathematical and include matter, measurement and problem solving; atomic theory and structure; the periodic table; and nomenclature.

Other topics covered in the class are the physical properties of gases, liquids, and solids; molecular bonding and geometry; stoichiometry; thermochemistry; the types of chemical reactions; and solution chemistry. The virtual laboratory exercises in this course are designed to help students to learn how to make qualitative and quantitative observations about physical and chemical phenomena; to make calculations; and to test their own reasoning. Students will also acquire skills in laboratory techniques to reinforce and build upon the concepts presented in class lectures. This is a time- and resource-intensive course. Students intending to use this course to satisfy prerequisites for pre-professional programs should verify that the CHEM133 and CHEM134 course sequence meets the requirements of their intended program prior to enrollment. To be successful in this course, it is recommended that students complete high school chemistry or a basic college equivalent, and they should also be comfortable with basic algebra, including the manipulation of equations.

View the course schedule (<https://www.apus.edu/course-schedule/details.html?c=CHEM133>) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

### **CHEM134 General Chemistry II with Lab (4 semester hours)**

This is the second course of a two-course general chemistry sequence that introduces students to the principles, terminology, methodology, and worldview of chemistry. Lecture and lab topics are both descriptive and mathematical and include solution chemistry; chemical kinetics; chemical equilibrium; acids and bases; aqueous ionic equilibrium; free energy; thermodynamics; electrochemistry; radioactivity; and nuclear chemistry. The virtual laboratory in this course is designed for students to learn how to make qualitative and quantitative observations about physical and chemical phenomena, to make calculations, and to test their own reasoning. Students will also acquire skills in laboratory techniques designed to help reinforce and build upon the concepts presented in the lecture portion of the class. This is a time- and resource-intensive course. Students intending to use this course to satisfy prerequisites for pre-professional programs should verify that the CHEM133 and CHEM134 course sequence meets the requirements of their intended program prior to enrollment. In order to be successful in this course, students must have successfully completed CHEM 133 General Chemistry I with Lab or an equivalent course. (Prerequisite: CHEM133)

View the course schedule (<https://www.apus.edu/course-schedule/details.html?c=CHEM134>) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

### **CHEM180 Introduction to Chemistry (3 semester hours)**

This course introduces students to the principles of basic chemistry; the terminology, methodology, and world view of chemistry; and chemistry's practical application to everyday living. Topics discussed in the course include acids, bases, atomic structure, chemical equations, chemical reactions, and chemical language and nomenclature. Other topics that will be covered in the course include gases, molecular structure, solution chemistry, chemical mathematics, organic chemistry, and biochemistry. Also, students will discuss the process of the scientific method and be required to demonstrate science information literacy skills through the creation of a narrated presentation. Topics covered in this course require some comfort with math. This course is time-intensive, so students should ensure they have the time to fully commit to this course if it is used to fulfill the General Education science course requirement.

View the course schedule (<https://www.apus.edu/course-schedule/details.html?c=CHEM180>) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

**CHEM233 Organic Chemistry I with Lab (4 semester hours)**

Fundamentals of bonding, structure, and reactions of organic compounds, including nomenclature, molecular geometry, polarity, conformation, isomerism, functional groups, stereochemistry, reactions and reaction mechanisms, and spectroscopy. Designed primarily for chemical engineering and the biological sciences majors: premedical, predoctoral, life sciences, and pharmacy. (Prerequisite: CHEM134)  
View the course schedule (<https://www.apus.edu/course-schedule/details.html?c=CHEM233>) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.

**CHEM234 Organic Chemistry II with Lab (4 semester hours)**

Emphasis on organic reactions, reaction mechanisms, synthesis, and spectroscopy building on the foundation of Organic Chemistry I, including functional group reactivity of carbonyl compounds, aromatic compounds, organic acids and bases, polymers, and biomolecules. Designed primarily for chemical engineering and the biological sciences majors: premedical, predoctoral, life sciences, and pharmacy. (Prerequisite: CHEM233)  
View the course schedule (<https://www.apus.edu/course-schedule/details.html?c=CHEM234>) to find out details about each course including prerequisites, course objectives, course materials, a snapshot of the syllabi, and session dates.