

# CHM - CHEMISTRY

## CHM 101 4 credit hours (lecture: 3 | lab: 3)

### Introductory Chemistry

Course introduces the basic concepts and language of chemistry; includes lectures and weekly hands-on laboratory. Content includes classification, properties and states of matter; measurements; atomic structure and bonding; properties of gases; chemical reactions and stoichiometry.

Similar to CHM 105, but more in-depth coverage of fewer topics. Credit toward graduation cannot be received for both CHM 101 and CHM 105.

**Prerequisite:** Successful completion of MAT 065 or higher, except MAT 111, or MAT 114 with a minimum grade of C; or appropriate Math placement; or consent of instructor.

**Recommended:** COL 101.

*IAI General Education: P1 902L*

*Instruction Type: In-Person | Online | Hybrid* Fee: \$40

*Term Typically Offered: Fall | Spring | Summer*

## CHM 105 4 credit hours (lecture: 3 | lab: 3)

### Elements of Chemistry

Course is one-semester survey of concepts of general, organic and biochemistry. Content includes classification, properties and states of matter; atomic structure and bonding; reactions of some inorganic compounds; a survey of functional groups, structure and properties of organic and biochemical compounds. Intended for students preparing for nursing and certain other health career programs. Credit toward graduation cannot be received for both CHM 101 and CHM 105.

**Prerequisite:** Successful completion of MAT 065 or higher, except MAT 111, or MAT 114 with a minimum grade of C; or appropriate Math placement; or consent of instructor.

**Recommended:** COL 101.

*IAI General Education: P1 902L*

*Instruction Type: In-Person | Online | Hybrid* Fee: \$40

*Term Typically Offered: Fall | Spring | Summer*

## CHM 121 4 credit hours (lecture: 3 | lab: 3)

### General College Chemistry I

Course is first of two semester sequence (CHM 121 and CHM 122). Content includes the periodic table of elements, atomic structure, basic concepts of quantum theory, stoichiometry of compounds and reactions, thermochemistry, molecular structure, bonding, intermolecular interactions, the gaseous state, and solutions. Weekly hands-on lab activities. Intended for students enrolled in science and/or pre-professional curricula.

**Prerequisite:** MAT 095 (formerly MAT 110) or MAT 092 with a minimum grade of C or appropriate score on the Mathematics Placement Test, and one year of high school chemistry or CHM 101 or CHM 105 with a minimum grade of C, or consent of instructor.

**Recommended:** MAT 140 or MAT 149.

*IAI General Education: P1 902L*

*IAI Major: CHM 911*

*Instruction Type: In-Person | Online | Hybrid* Fee: \$40

*Term Typically Offered: Fall | Spring | Summer*

## CHM 122 4 credit hours (lecture: 3 | lab: 3)

### General College Chemistry II

Course continues CHM 121. Content includes kinetics, chemical equilibrium, acid-base theory and equilibria, solubility equilibria, electrochemistry, thermodynamics, nuclear chemistry, coordination compounds, and an introduction to organic chemistry. Weekly laboratory activities.

**Prerequisite:** CHM 121 with a minimum grade of C, and MAT 140 or MAT 149 with a minimum grade of C, or appropriate score on the mathematics placement test, or consent of instructor.

*IAI Major: CHM 912*

*Instruction Type: In-Person | Online | Hybrid* Fee: \$40

*Term Typically Offered: Fall | Spring | Summer*

## CHM 207 5 credit hours (lecture: 3 | lab: 4)

### Elementary Organic Chemistry

Course is one-semester survey of organic chemistry. Content includes an introduction and overview of the structure, nomenclature, properties, preparation, and reactions of the main organic functional groups; introduces biochemistry, including categories of bio-molecules and pharmaceuticals. Two weekly hands-on lab sessions. Intended for those whose curriculum requires only one semester of organic chemistry.

**Prerequisite:** CHM 101, or CHM 105, or CHM 121, with minimum grade of C in all courses, or consent of instructor.

*Instruction Type: In-Person | Online | Hybrid* Fee: \$45

*Term Typically Offered: Fall | Spring*

## CHM 221 4 credit hours (lecture: 3 | lab: 3)

### Organic Chemistry I

Course is first of two-course sequence (CHM 221 and CHM 222). Content presents theories, structures, and reactions of organic chemistry, including the properties of various functional groups; bonding and structure of organic molecules; properties and reactions of aromatic and aliphatic hydrocarbons and alkyl halides; stereochemistry; spectroscopy, including infrared and nuclear magnetic resonance; reaction intermediates and mechanisms such as nucleophilic substitutions and electrophilic additions; and multi-step organic synthesis. Weekly hands-on lab activities including preparations, separations, and identifications of organic compounds. Identical to CHM 223 except that CHM 221 includes one three-hour laboratory per week, rather than two three-hour laboratory periods per week.

**Prerequisite:** CHM 122 with a minimum grade of C or consent of instructor.

*Instruction Type: In-Person | Hybrid*

Fee: \$40

*Term Typically Offered: Summer*

## CHM 222 4 credit hours (lecture: 3 | lab: 3)

### Organic Chemistry II

Course is second of two-course sequence (CHM 221 and CHM 222). Content includes study of structure, nomenclature, properties and reactions of alcohols and phenols, aldehydes and ketones, carboxylic acids and their derivatives, amines, condensation reactions, polymers, and biomolecules. Weekly hands-on laboratory activities including preparations, separations, and identifications of organic compounds. It is identical to CHM 224 except that CHM 222 includes one three-hour lab per week, rather than the two three-hour labs per week.

**Prerequisite:** CHM 221, or CHM 223, with minimum grade of C in all courses, or consent of instructor.

*Instruction Type: In-Person | Hybrid*

Fee: \$40

*Term Typically Offered: Summer*

- CHM 223** **5 credit hours (lecture: 3 | lab: 6)**  
**Organic Chemistry I**  
 Course is first of two-course sequence (CHM 223 and CHM 224). Content presents theories, structures, and reactions of organic chemistry, including the properties of various functional groups; bonding and structure of organic molecules; properties and reactions of aromatic and aliphatic hydrocarbons and alkyl halides; stereochemistry; spectroscopy, including infrared and nuclear magnetic resonance; reaction intermediates and mechanisms such as nucleophilic substitutions and electrophilic additions; and multi-step organic synthesis. Weekly hands-on lab activities including preparations, separations, and identifications of organic compounds. Identical to CHM 221 except that CHM 223 includes two three-hour labs per week, rather than one three-hour lab per week.  
**Prerequisite:** CHM 122 with minimum grade of C, or consent of instructor.  
*IAI Major: CHM 913*  
*Instruction Type: In-Person | Online | Hybrid* Fee: \$50  
*Term Typically Offered: Fall | Spring*
- CHM 224** **5 credit hours (lecture: 3 | lab: 6)**  
**Organic Chemistry II**  
 Course is second of two-course sequence (CHM 223 and CHM 224). Content includes study of structure, nomenclature, properties and reactions of alcohols and phenols, aldehydes and ketones, carboxylic acids and their derivatives, amines, condensation reactions, polymers, and biomolecules. Weekly hands-on lab activities including preparations, separations, and identifications of organic compounds. Identical to CHM 222 except that CHM 224 includes two three-hour labs per week, rather than one three-hour lab per week.  
**Prerequisite:** CHM 221, or CHM 223, with minimum grade of C, or consent of instructor.  
*IAI Major: CHM 914*  
*Instruction Type: In-Person | Online | Hybrid* Fee: \$50  
*Term Typically Offered: Fall | Spring*
- CHM 225** **4 credit hours (lecture: 4 | lab: 0)**  
**Organic Chemistry I Lecture**  
 Course is first of two-course sequence (CHM 225 and CHM 226). Content presents theories, structures, and reactions of organic chemistry, including the properties of various functional groups; bonding and structure of organic molecules; properties and reactions of aromatic and aliphatic hydrocarbons and alkyl halides; stereochemistry; spectroscopy, including infrared and nuclear magnetic resonance; reaction intermediates and mechanisms such as nucleophilic substitutions and electrophilic additions; and multi-step organic synthesis. Credit toward graduation cannot be received for both CHM 223 and CHM 225. Credit toward graduation cannot be received for both CHM 221 and CHM 225.  
**Prerequisite:** CHM 122 with a minimum grade of C or consent of instructor.  
*Instruction Type: In-Person | Online | Hybrid*
- CHM 226** **4 credit hours (lecture: 4 | lab: 0)**  
**Organic Chemistry II Lecture**  
 Course is second of two-course sequence (CHM 225 and CHM 226). Content includes study of structure, nomenclature, properties and reactions of alcohols and phenols, aldehydes and ketones, carboxylic acids and their derivatives, amines, condensation reactions, polymers, and biomolecules. Credit toward graduation cannot be received for both CHM 222 and CHM 226. Credit toward graduation cannot be received for both CHM 224 and CHM 226.  
**Prerequisite:** CHM 221 or CHM 223 or CHM 225 with minimum grade of C or consent of instructor.  
*Instruction Type: In-Person | Online | Hybrid*
- CHM 227** **2 credit hours (lecture: 1 | lab: 3)**  
**Organic Chemistry I Laboratory**  
 Course introduces organic chemistry laboratory techniques (extraction, distillation, chromatography, crystallization, melting point analysis), instrumentation (infrared spectroscopy, polarimetry, gas-chromatography) and the synthesis of organic compounds (nucleophilic substitution, elimination, electrophilic addition). Credit cannot be received in both CHM 221 and CHM 227. Credit toward graduation cannot be received for both CHM 223 and CHM 227.  
**Prerequisite:** CHM 225 with a minimum grade of C or concurrent enrollment in CHM 225.  
*Instruction Type: In-Person* Fee: \$50
- CHM 228** **2 credit hours (lecture: 1 | lab: 3)**  
**Organic Chemistry II Laboratory**  
 Laboratory focuses on the preparation, separation, purification and identification of organic compounds (alcohols, ketones and aldehydes, carboxylic acids and derivatives, amines, polymers). Properties of biomolecules are investigated (carbohydrates, amino acids, peptides, lipids). Analytical techniques are used to characterize chemical reactions and their products (HPLC, GC, IR, polarimetry). Credit toward graduation cannot be received for both CHM 222 and CHM 228. Credit toward graduation cannot be received for both CHM 224 and CHM 228.  
**Prerequisite:** CHM 226 with a minimum grade of C or concurrent enrollment in CHM 226.  
*Instruction Type: In-Person* Fee: \$50
- CHM 229** **3 credit hours (lecture: 3 | lab: 0)**  
**Biochemistry**  
 Course introduces molecules, macromolecules, and processes found in living organisms. Content includes structures of amino acids, nucleotides, lipids, and sugars; corresponding macromolecular structures, i.e., proteins, nucleic acids, membranes, and polysaccharides as related to their biological functions; kinetics and mechanism of enzymatic reactions, the central metabolic pathways, the genetic code and developments in biotechnology.  
**Prerequisite:** CHM 122 and one of the following courses: CHM 207 or CHM 221 or CHM 223 or CHM 225, each with a minimum grade of C, or consent of instructor.  
**Recommended:** BIO 101 or higher BIO course.  
*Instruction Type: In-Person | Online*  
*Term Typically Offered: Fall | Spring | Summer*
- CHM 240** **3 credit hours (lecture: 1 | lab: 4)**  
**Interdisciplinary Undergraduate Laboratory Research**  
 Course provides undergraduate research experience. Interdisciplinary course co-listed with BIO 240. Team-taught by faculty from several disciplines. Content includes active participation in selected research experiences including: developing an independent research project; designing and performing experiments; collecting data; analyzing results; participating in collaborative research with other students and professors; learning how to discriminate among various types of scientific literature; reading, critiquing and presenting research articles in a selected area of research; and presenting research at end of semester in both written and oral form. This course can be repeated once for credit.  
**Prerequisite:** Honor student status or consent of instructor.  
*Instruction Type: In-Person | Online | Hybrid* Fee: \$50  
*Term Typically Offered: Fall | Spring*

**CHM 290****1-4 credit hours (lecture: 1-4 | lab: 1-4)****Topics in Chemistry**

Course meets special interest needs of CHM students. Special topics offered for variable credit from one to four semester credit hours. Course may be taken for credit up to four times on different topics. Fee Varies.

Prerequisite may vary by topic.

*Instruction Type: In-Person*