

# CHEMISTRY (CHEMI)

## CHEMI 0485

### *Basic Laboratory and Computation Chemistry*

3 Credit Hours

This is a preparatory class for students who plan to enroll in CHEMI 1551, but have not yet satisfied the high school chemistry prerequisite. Topics include the metric system, dimensional analysis, physical and chemical properties of matter, chemical formulas and equations, stoichiometry, solutions, and gas laws. Students will record and analyze qualitative and quantitative measurements in the laboratory. Note: This class does not meet a Physical Science General Education Requirement, nor does it count as college-level credit. (2 lecture hours, 2 lab hours)

## CHEMI 1105 (P1 903L)

### *Contemporary Chemistry*

4 Credit Hours

Introduction to chemical concepts using practical issues and applications to illustrate the principles of chemistry. The language of chemistry, scientific method and measurement, experimentation with data collection, and current issues with application to chemical principles. One year of high school algebra is recommended. This course is not a prerequisite for CHEMI 1212. (3 lecture hours, 3 lab hours)

**Course types:** General Education: Physical Sciences (A.A.S., A.G.S.), General Education: Physical/Life Science (A.A.S., A.G.S.)

## CHEMI 1205 (P1 903L)

### *Intro to Forensic Science & Chemistry*

4 Credit Hours

Basic principles and uses of forensic science in the United States system of justice. Addresses the application of science to the processes of law, and involves the collection, examination, evaluation and interpretation of evidence. Applies chemical concepts to evidence and law. (3 lecture hours, 3 lab hours)

**Course types:** General Education: Physical Sciences (A.A.S., A.G.S.), General Education: Physical/Life Science (A.A.S., A.G.S.)

## CHEMI 1211 (P1 902L)

### *Survey of General Chemistry*

5 Credit Hours

This is a one-semester survey of general inorganic chemistry intended for health science majors. Topics include: formula naming, atomic structure, stoichiometry, gas laws, solutions, equilibria, oxidation-reduction, acid-base theory, and nuclear chemistry. Not intended for science or engineering majors; not intended for pre-professional programs (e.g. pre-med). (4 lecture hours, 3 lab hours)

**Prerequisite:** MATH 0465 or MATH 0481 (or college equivalent) with a grade of C or better, or a qualifying score on the mathematics placement test or a qualifying A.C.T. math score. This course requires Reading Placement Category One.

**Course types:** General Education: Physical Sciences (A.A.S., A.G.S.), General Education: Physical/Life Science (A.A.S., A.G.S.)

## CHEMI 1212

### *Survey of Organic Chemistry*

5 Credit Hours

Introduction to organic chemistry. Nomenclature, structure, physical properties, reactions, and synthesis of major organic functional groups. Intended for health science majors. (4 lecture hours, 3 lab hours)

**Prerequisite:** CHEMI 1211 with a grade of C or better, or equivalent or CHEMI 1551 with a grade of C or better, or equivalent.

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

## CHEMI 1237

### *Scientific Concepts - Sustainable Energy*

4 Credit Hours

Non-mathematical approach in examining a range of sustainable energy sources including wind, solar, ethanol, biodiesel, gasification, geothermal, hydrogen and fuel cells. Fundamental laws governing energy conversion in sustainable energy are introduced. Economic and environmental issues and the role of climate change in sustainable energy will be reviewed. Intended for students interested in a career in the renewable energy industry and non-science majors. Provides experience from theoretical, laboratory and laboratory simulation perspectives. (3 lecture hours, 3 lab hours)

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

## CHEMI 1551 (P1 902L/CHM 911)

### *Principles of Chemistry I*

5 Credit Hours

This is the first course of a two-semester sequence of general chemistry for science and engineering majors. Topics include: measurement, the mole concept, composition and reaction stoichiometry, types of reactions, thermochemistry, atomic theories, chemical periodicity, bonding, molecular geometry, and properties and theories of the gaseous, liquid, and solid states. Laboratory includes both qualitative and quantitative analysis. (4 lecture hours, 3 lab hours)

**Prerequisite:** MATH 1428 (or college equivalent) or MATH 1431 (or college equivalent) with a grade of C or better, or qualifying score on the mathematics placement test or a qualifying A.C.T. math score and one year high school chemistry with a satisfactory grade or CHEMI 0485 (or college equivalent) with a grade of C or better.

**Course types:** General Education: Physical Sciences (A.A.S., A.G.S.), General Education: Physical/Life Science (A.A.S., A.G.S.)

## CHEMI 1552 (CHM 912)

### *Principles of Chemistry II*

5 Credit Hours

This is the second course of a two-semester sequence of general chemistry for science and engineering majors. Topics include: properties of solutions, chemical kinetics, equilibrium, acid-base theory and equilibria, solubility equilibria, electrochemistry, thermodynamics, coordination chemistry, and nuclear chemistry. Laboratory includes both qualitative and quantitative analysis. (4 lecture hours, 3 lab hours)

**Prerequisite:** CHEMI 1551 with a grade of C or better, or equivalent.

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

## CHEMI 1800

### *Special Project*

1-3 Credit Hours

Special project courses in chemistry cover topics not otherwise covered by general education courses and other courses in the catalog for the chemistry discipline while building upon academic knowledge and skills acquired in introductory-level chemistry classes. These courses require direct experience and focused reflection in an in-depth study of a specific chemistry topic and/or the critical analysis of contemporary issues in chemistry. They are targeted to self-selected students with an interest in the subject matter and involve active participation. The course delivery incorporates an experiential component of no less than 30% but not to exceed 70%. This experiential component may include field studies, interdisciplinary learning, and/or the practical application of chemistry concepts, theories, principles and methods with a specific focus. All courses require an orientation session to deliver academic and experiential information (syllabus, academic requirements, field preparation, logistics, etc.)

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEMI 1820*****Selected Topics I***

1-3 Credit Hours

Introductory exploration and analysis of selected topics with a specific theme indicated by course title listed in college class schedule. This course may be taken four times for credit as long as different topics are selected. (1 to 3 lecture hours)

**Prerequisite:** Consent of instructor is required.

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEMI 1821*****Selected Topics II***

3 Credit Hours

Introductory exploration and analysis of selected topics with a specific theme indicated by course title listed in college class schedule. This course may be taken four times for credit as long as different topics are selected. (2 lecture hours, 2 lab hours)

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEMI 1840*****Independent Study***

1-4 Credit Hours

Exploration and analysis of topics within the discipline to meet individual student-defined course description, goals, objectives, topical outline and methods of evaluation in coordination with and approved by the instructor. This course may be taken four times for credit as long as different topics are selected. (1 to 4 lecture hours)

**Prerequisite:** Consent of instructor is required.

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEMI 2203*****Introduction to Biochemistry***

3 Credit Hours

Introduction to the biochemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids. Survey of molecular genetics and the tools and techniques of genetic engineering. This course does not have a laboratory component. Students receive credit for either CHEMI2203 or CHEMI2213. (3 lecture hours)

**Prerequisite:** CHEMI 1212 with a grade of C or better, or equivalent or CHEMI 2551 with a grade of C or better, or equivalent.

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEMI 2213*****Introduction to Biochemistry With Laboratory***

4 Credit Hours

Introduction to the biochemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids. Survey of molecular genetics and the tools and techniques of genetic engineering. Investigation of reactions of carbohydrates, lipids, proteins and nucleic acids in the laboratory. Students receive credit for either CHEMI2213 or CHEMI2203. (3 lecture hours, 3 lab hours)

**Prerequisite:** CHEMI 1212 with a grade of C or better, or equivalent or CHEMI 2551 with a grade of C or better, or equivalent.

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEMI 2551 (CHM 913)*****Organic Chemistry I***

5 Credit Hours

This is the first semester of a one-year course in Organic Chemistry for science and engineering majors. Topics include bonding principles, functional groups and their properties, isomerism, stereochemistry, nomenclature, synthesis and reactions of alkanes and cycloalkanes, alkenes, alkynes, alcohols, alkyl halides, and conjugated dienes. Mechanisms include addition, elimination, rearrangement, and substitution. Laboratory emphasizes small-scale techniques, separations, purifications, syntheses, and infrared and nuclear magnetic resonance spectroscopy. (4 lecture hours, 3 lab hours)

**Prerequisite:** CHEMI 1552 with a grade of C or better, or equivalent.

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEMI 2552 (CHM 914)*****Organic Chemistry II***

5 Credit Hours

This is the second semester of a one-year course in Organic Chemistry for science and engineering majors. Topics include nomenclature, properties, reactions and synthesis of aromatics, organometallics, alcohols and thiols, phenols, ethers and sulfides, aldehydes and ketones, carboxylic acids and their derivatives, amines, carbohydrates, amino acids, proteins, and nucleic acids. Mechanisms include electrophilic aromatic substitution and nucleophilic addition. Laboratory emphasizes single and multi-step syntheses along with mass spectrometry, ultraviolet, and carbon-13 nuclear magnetic resonance spectroscopy with integrated spectral analysis. (4 lecture hours, 3 lab hours)

**Prerequisite:** CHEMI 2551 with a grade of C or better, or equivalent.

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEMI 2800*****Special Project***

1-3 Credit Hours

Special project courses in chemistry cover topics not otherwise covered by general education courses and other courses in the Catalog for the chemistry discipline. These course require direct experience and focused reflection in an in-depth study of a specific chemistry topic and/or the critical analysis of contemporary issue in chemistry. They are targeted to self-selected students with an interest in the subject matter involve active participation. The course delivery incorporates an experimental component of no less than 30 percent but not to exceed 70 percent. This experiential component may include field studies, interdisciplinary learning and/or the practical application of chemistry concepts, theories, principle and methods with a specific focus. All courses require an orientation session to deliver academic and experiential information (syllabus, academic requirements, field preparation, logistics, etc.) (1 to 3 lecture hours, 1 to 3 lab hours)

**Prerequisite:** At least one course in Chemistry or consent of the instructor.

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEMI 2820*****Advanced Selected Topics I***

1-3 Credit Hours

Advanced exploration and analysis of selected topics with a specific theme indicated by course title listed in college class schedule. This course may be taken four times for credit as long as different topics are selected. (1 to 3 lecture hours)

**Prerequisite:** One other course in the discipline and consent of instructor.

**Course types:** General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEM 2860*****Internship (Career & Technical Ed)***

1-4 Credit Hours

Course requires participation in Career and Technical Education work experience with onsite supervision. Internship learning objectives are developed by student and faculty member, with approval of employer, to provide appropriate work-based learning experiences. Credit is earned by working a minimum of 75 clock hours per semester credit hour, up to a maximum of four credits. (5 to 20 lab hours)

**Prerequisite:** Consent of instructor and 2.0 cumulative grade point average; 12 semester credits earned in a related field of study; students work with Career Services staff to obtain approval of the internship by the Dean from the academic discipline where the student is planning to earn credit.

**Course types:** Contemporary Life Skills (A.A., A.S., A.A.S., A.G.S.), General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEM 2865*****Internship Advanced (Career & Tech Ed)***

1-4 Credit Hours

Continuation of Internship (Career and Technical Education). Course requires participation in Career & Technical Education work experience with onsite supervision. Internship learning objectives are developed by student and faculty member, with approval of employer, to provide appropriate work-based learning experiences. Credit is earned by working a minimum of 75 clock hours per semester credit hour, up to a maximum of four credits. (5 to 20 lab hours)

**Prerequisite:** Consent of instructor and 2.0 cumulative grade point average; 12 semester credits earned in a related field of study; students work with Career Services staff to obtain approval of the internship by the Dean from the academic discipline where the student is planning to earn credit.

**Course types:** Contemporary Life Skills (A.A., A.S., A.A.S., A.G.S.), General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEM 2870*****Internship (Transfer)***

1-4 Credit Hours

Course requires participation in work experience with onsite supervision. Internship learning objectives are developed by student and faculty member, with approval of employer, to provide appropriate work-based learning experiences. Credit is earned by working a minimum of 75 clock hours per semester credit hour, up to a maximum of four credits. (5 to 20 lab hours)

**Prerequisite:** Consent of instructor and 2.0 cumulative grade point average; 12 semester credits earned in a related field of study; students work with Career Services staff to obtain approval of the internship by the Dean from the academic discipline where the student is planning to earn credit.

**Course types:** Contemporary Life Skills (A.A., A.S., A.A.S., A.G.S.), General Education: Physical/Life Science (A.A.S., A.G.S.)

**CHEM 2871*****Internship - Advanced (Transfer)***

1-4 Credit Hours

Continuation of Internship (Transfer). Course requires participation in work experience with onsite supervision. Internship learning objectives are developed by student and faculty member, with approval of employer, to provide appropriate work-based learning experiences. Credit is earned by working a minimum of 75 clock hours per semester credit hour, up to a maximum of four credits. (5 to 20 lab hours)

**Prerequisite:** Consent of instructor and 2.0 cumulative grade point average; 12 semester credits earned in a related field of study; students work with Career Services staff to obtain approval of the internship by the Dean from the academic discipline where the student is planning to earn credit.

**Course types:** Contemporary Life Skills (A.A., A.S., A.A.S., A.G.S.), General Education: Physical/Life Science (A.A.S., A.G.S.)