

CHEM Courses (Chemistry)

The first number is course level (1 = freshman, 2 = sophomore, 3 = junior, 4 = senior, 5 = graduate).

The middle two numbers are identifiers specific to the course

The last number is the number of credit hours

CHEM 1023 Introductory Chemistry

A.C.T.S. Equivalent Course # CHEM 1004 when combined with CHEM 1031 Introductory Chemistry Lab

3 credits: 3 hours lecture

Corequisites: ENGL 1013 and MATH 183, or equivalent

Introduction to the structure of matter, its classification, and the physical, chemical, and nuclear changes it undergoes.

CHEM 1031 Introductory Chemistry Laboratory

A.C.T.S. Equivalent Course # CHEM 1004 when combined with CHEM 1023 Introductory Chemistry

1 credit: 2 hours laboratory

Corequisite: CHEM 1023

Basic studies in chemical experimentation including measurements, properties of elements and compounds, and reactions of matter.

CHEM 1103 General Chemistry I

A.C.T.S. Equivalent Course # CHEM 1404 when combined with CHEM 1121 General Chemistry I Laboratory

3 credits: 3 hours lecture

Corequisites: CHEM 1121, ENGL 1013 and MATH 1043

The study of measurement systems, significant figures, atomic and molecular structure, gas laws, thermochemistry, solutions, states of matter, chemical bonding, chemical reactions, and stoichiometry.

CHEM 1113 General Chemistry II

A.C.T.S. Equivalent Course # CHEM 1424 when combined with CHEM 1131 General Chemistry II Laboratory

3 credits: 3 hours lecture

Prerequisites: CHEM 1103 and CHEM 1121

Corequisite: CHEM 1131

The study of kinetics, equilibrium, thermodynamics, electrochemistry, oxidation-reduction, acid-base chemistry, nuclear chemistry, and selected descriptive chemistry. An ACS standardized exam will be given as the final exam.

CHEM 1121 General Chemistry I Laboratory

A.C.T.S. Equivalent Course # CHEM 1404 when combined with CHEM 1103 General Chemistry I

1 credit: 3 hours laboratory

Corequisite: CHEM 1103

Experimentation and theory in the areas of measurement systems, chemical analysis, chemical reactions, stoichiometry, thermochemistry, and molecular structure.

CHEM 1131 General Chemistry II Laboratory

A.C.T.S. Equivalent Course # CHEM 1424 when combined with CHEM 1113 General Chemistry II

1 credit: 3 hours laboratory

Corequisite: CHEM 1113

Experimentation and theory in the areas of qualitative analysis, oxidation-reduction, equilibrium, acid-base chemistry, and thermodynamics.

CHEM 2203 Introduction to Organic and Biochemistry

A.C.T.S. Equivalent Course # CHEM 1224 when combined with CHEM 2211 Introduction to Organic and Biochemistry Laboratory

3 credits: 3 hours lecture

Prerequisite: CHEM 1023 or CHEM 1103

Chemical substances from which life is formed. Designed for those who desire a general overview of organic and biochemistry.

CHEM 2211 Introduction to Organic and Biochemistry Laboratory

A.C.T.S. Equivalent Course # CHEM 1224 when combined with CHEM 2203 Introduction to Organic and Biochemistry

1 credit: 3 hours laboratory

Corequisite: CHEM 2203 or passing grade from CHEM 2203

Experimentation and theory related to the basic concepts in organic and biochemistry. Topics include: study of physical and chemical properties, separation, purification, identification, chemical reactivity, and synthesis of organic compounds.

CHEM 3314 Quantitative Analysis

4 credits: 2 hours lecture, 6 hours laboratory

Prerequisites: CHEM 1113 and CHEM 1131, MATH 1043 or MATH 1175

Analytical chemistry with emphasis on the principles and theories of gravimetric and volumetric analysis. Offered: Fall.

CHEM 3404 Organic Chemistry I

4 credits: 3 hours lecture, 3 hours laboratory

Prerequisites: CHEM 1113 and CHEM 1131

A study of carbon compounds, including an introduction to organic nomenclature, reactions, reaction mechanisms, organic synthesis, and structural and stereochemical problems. Offered: Fall.

CHEM 3414 Organic Chemistry II

4 credits: 3 hours lecture, 3 hours laboratory

Prerequisite: CHEM 3404

A continuation of Organic Chemistry I (3404). A study of organic nomenclature, reactions, reaction mechanisms, organic spectroscopy, and greater emphasis on organic synthesis. An ACS standardized exam will be given as the final exam. Offered: Spring.

CHEM 3424 Elements of Physical Chemistry

4 credits: 3 hours lecture, 3 hours laboratory

Prerequisites: MATH 2255 and a minimum twelve hours CHEM courses

Fundamental concepts of physical chemistry primarily for Biochemistry Option Chemistry majors and pre-professional students. Concepts will be presented utilizing basic calculus with applications to life processes and biochemistry. This course will not fulfill the Physical Chemistry requirements for the traditional Chemistry degree. Offered: Spring.

CHEM 3444 Instrumental Analysis

4 credits: 3 hours lecture, 3 hours laboratory

Prerequisites: CHEM 3314 and PHYS 2203 or PHYS 2213

Theoretical and practical application of instrumental methods to chemical analysis. Offered: Spring, odd-numbered years.

CHEM 3454 Organic Analysis

4 credits: 3 hours lecture, 3 hours laboratory

Prerequisite: CHEM 3414

Systematic separation and identification of organic compounds with emphasis on molecular structure. Use and theory of spectrometric methods and other physical techniques.

CHEM 4503 Special Topics in Chemistry

3 credits: 3 hours lecture

Prerequisites: Completion of at least sixteen hours of chemistry and permission of both the instructor and the School Dean

Selected topics in chemistry chosen by the instructor will be presented. The purpose of this course is to provide the students with specialized training in a specific area of chemistry not covered in other chemistry courses.

May be repeated for a maximum of 9 hours.

CHEM 4511 Special Topics in Chemistry Laboratory

1 credit: 3 hours laboratory

Prerequisites: Completion of at least sixteen hours of chemistry and permission of both the instructor and the School Dean

Selected topics in chemistry chosen by the instructor will be presented. The purpose of this course is to provide the students with specialized training in a specific area of chemistry not covered in other chemistry courses.

May be repeated for a maximum of 3 hours.

CHEM 4603 Structure and Mechanism

3 credits: 3 hours lecture

Prerequisite: CHEM 3404

Structural considerations of organic chemistry including stereochemistry, electronic theory, and mechanisms.

CHEM 4611 Chemistry Seminar

1 credit: 1 hour lecture

Prerequisites: Completion of at least 24 hours of chemistry with a G.P.A. in chemistry of at least 3.00 and instructor's permission

Students give oral presentations on different topics each semester based on laboratory and/or library research.

The course may be repeated for a maximum of 2 credit hours.

CHEM 4623 Advanced Inorganic Chemistry

3 credits: 3 hours lecture

Prerequisites: twelve hours of chemistry

Nuclear chemistry, theories of chemical bonding, acid-base definitions, coordination compounds, or organometallic chemistry, and selected descriptive chemistry. Offered: Fall, even-numbered years.

CHEM 4633 Biochemistry I

3 credits: 3 hours lecture

Prerequisite: CHEM 3414

Introduction to the chemical aspects of living systems: organization and production of cellular macromolecules, production and utilization of energy by the cell, major metabolic pathways and biochemical control mechanisms. Offered: Fall.

CHEM 4643 Biochemistry II

3 credits: 3 hours lecture

Prerequisite: CHEM 4633

Continuation of studies of chemical aspects of living systems: organization and production of cellular macromolecules, production and utilization of energy by the cell, major metabolic pathways and biochemical control mechanisms. Offered: Spring

CHEM 469V Senior Research

Variable credit

Prerequisites: junior or senior standing and approval of a project proposal by the School Dean

NOTE: Open only to chemistry majors. May be repeated for a maximum of 6 hours of credits.

Literature search and laboratory work on individual research problems.

CHEM 4704 Physical Chemistry: Thermodynamics

4 credits: 3 hours lecture, 3 hours laboratory

Prerequisites: MATH 3495, PHYS 2323 and PHYS 2241, and twelve hours of chemistry

Corequisite: MATH 3525

Principles of theoretical chemistry and their mathematical interpretations, emphasizing thermodynamics.

Offered: Spring, odd-numbered years.

CHEM 4714 Physical Chemistry: Kinetic and Quantum Mechanics

4 credits: 3 hours lecture, 3 hours laboratory

Prerequisites: MATH 3495, PHYS 2323 and PHYS 2241, and twelve hours of chemistry

Corequisite: MATH 3525

NOTE: May be taken prior to CHEM 4704.

Principles of theoretical chemistry and their mathematical interpretations, emphasizing kinetics and quantum chemistry. Offered: Spring, even-numbered years.

CHEM 4731 Biochemistry Laboratory

1 credit: 3 hours laboratory

Co/Prerequisite: CHEM 4633

A laboratory course in modern biochemical techniques investigating proteins, nucleic acids, carbohydrates, and lipids.

CHEM 4742 Advanced Laboratory Techniques

2 Credits: 1 hour lecture, 3 hours laboratory

Prerequisite: 11 hours of 3000-4000 level chemistry and instructor's permission

Laboratory techniques including chemical separations, structure determination, reactions in air-free conditions, molecular modeling, use of specialized chemical instrumentation, and use of chemical literature.

CHEM 479V Independent Study in Chemistry

Variable credit

Consult the Independent Study Courses subheading in the Academic Regulations section of this catalog for prerequisites and description.