ALL COURSES

CHEMISTRY

CHEM 4XXX: CHEMISTRY TRANSFER ELECTIVE
Credit transfered from another institution and articulated for chemistry upper division elective.

CHEM 3XXX: CHEMISTRY TRANSFER ELECTIVE
Credit transfered from another institution and articulated for chemistry upper division elective.

CHEM 2XXX: CHEMISTRY TRANSFER ELECTIVE
Credit transfered from another institution and articulated for chemistry lower division elective.

CHEM 1XXX: CHEMISTRY TRANSFER ELECTIVE
Credit transfered from another institution and articulated for chemistry lower division elective.

CHEM 1111: Survey of Chemistry Laboratory
ACTS Common Course - CHEM 1214 (taken with CHEM 1113 A Survey of Chemistry)
Co-requisite: CHEM 1113 A Survey of Chemistry.
An introduction to laboratory experiences in chemistry.
$40 laboratory fee

CHEM 1113: A Survey of Chemistry
ACTS Common Course - CHEM 1214 (taken with CHEM 1111 Survey of Chemistry Laboratory)
Prerequisite: A score of 19 or above on the mathematics section of the ACTE exam, or completion of MATH 0903 Beginning and Intermediate Algebra, Intermediate Algebra, with a grade of C or better.
Co-requisite: CHEM 1111 Survey of Chemistry Laboratory
A survey of selected topics in chemistry for life science majors. A brief introduction to fundamental concepts, atomic structure, chemical bonding, and periodic law as applied in the life sciences and allied areas.
May not be taken for credit after completion of CHEM 2124 General Chemistry I or 2134.

CHEM 2111: Environmental Seminar
Cross-listed: BIOL 2111 Environmental Seminar, GEOL 2111 Environmental Seminar
A seminar for students pursuing the environmental option of chemistry, biology, or geology and other students interested in environmental sciences.

CHEM 2120: General Chemistry I Lab
Co-requisite for CHEM 2124 General Chemistry I General Chemistry I.

CHEM 2124: General Chemistry I
ACTS Common Course - CHEM 1414
Prerequisite: Score of 21 or higher on the math portion of the ACTE; or MATH 1113 College Algebra or equivalent; or a "C" or better in CHEM 1113 A Survey of Chemistry and CHEM 1111 Survey of Chemistry Laboratory; or approval of the instructor.
Co-requisite: CHEM 2120 General Chemistry I Lab
The first of a two semester sequence designed for science and engineering majors. Topics include qualitative and quantitative, applied and theoretical analyses of the interactions of matter; atoms, molecules, ions, the mole concept, chemical equations, gases, solutions, intermolecular forces, thermochemistry, quantum theory, periodic law, ionic and covalent bonding, molecular geometry.
Lecture three hours, laboratory three hours. $40 laboratory fee.

CHEM 2130: General Chemistry II Lab
Co-requisite for CHEM 2134 General Chemistry II, General Chemistry II.

CHEM 2134: General Chemistry II
ACTS Common Course - CHEM 1424
Prerequisite: A grade of C or better in CHEM 2124 General Chemistry I or equivalent.
Co-requisite: CHEM 2130 General Chemistry II Lab
A continuation of CHEM 2124 General Chemistry I, encompassing chemical kinetics, equilibrium, acid/base systems, atmospheric chemistry, thermodynamics, electrochemistry, descriptive inorganic chemistry and nuclear chemistry.
Lecture three hours, laboratory three hours. $40 laboratory fee.

CHEM 2204: Organic Physiological Chemistry
ACTS Common Course - CHEM 1224

Offered: Fall
Prerequisite: A grade of C or better in CHEM 1113 A Survey of Chemistry and CHEM 1111 Survey of Chemistry Laboratory or CHEM 2124 General Chemistry I.
For students who desire only one semester of organic/physiologic chemistry, such as wildlife biology and various allied health programs. A brief introduction to organic and physiological chemistry. The structures, reactions and biological aspects of organic compounds will be stressed.
Note: Will not be counted for chemistry credit toward the ACS approved BS in chemistry.
Lecture three hours, laboratory three hours. $40 laboratory fee.

CHEM 2991: Special Problems in Chemistry
Prerequisite: Permission of instructor
One to three credits, depending on the nature and extent of the problem. This course is designed to encourage creative, independent scientific activity on the part of advanced students. Problems will be designed to fit the future aspirations of individual students and will be supervised by a faculty mentor. $40 laboratory fee.

CHEM 2992: Special Problems in Chemistry
Prerequisite: Permission of instructor
One to three credits, depending on the nature and extent of the problem. This course is designed to encourage creative, independent scientific activity on the part of advanced students. Problems will be designed to fit the future aspirations of individual students and will be supervised by a faculty mentor. $40 laboratory fee.

CHEM 2993: Special Problems in Chemistry
Prerequisite: Permission of instructor
One to three credits, depending on the nature and extent of the problem. This course is designed to encourage creative, independent scientific activity on the part of advanced students. Problems will be designed to fit the future aspirations of individual students and will be supervised by a faculty mentor. $40 laboratory fee.

CHEM 3111: Environmental Seminar
Cross-listed: BIOL 3111 Environmental Seminar, ENVS 3111 Environmental Seminar, and GEOL 3111 Environmental Seminar
A seminar for students pursuing the environmental option of chemistry, biology, or geology and other students interested in environmental sciences.

CHEM 3245: Quantitative Analysis
Offered: Spring
Prerequisite: A grade of C or better in CHEM 2134 General Chemistry II
This is a lab intensive course, that focuses on a variety of experimental techniques that enable the chemist to characterize and quantify many types of samples.
Lecture three hours, laboratory six hours. $40 laboratory fee.

CHEM 3250: Fundamentals of Organic Chemistry Laboratory
Co-requisite: CHEM 3254 Fundamentals of Organic Chemistry.

CHEM 3254: Fundamentals of Organic Chemistry
Prerequisite: CHEM 2134 General Chemistry II
Co-requisite: CHEM 3250 Fundamentals of Organic Chemistry Laboratory.
An introduction to the chemistry of covalently bonded carbon. Special emphasis will be given to descriptive and structural aspects of Organic Chemistry.
Lecture three hours, laboratory three hours. $40 laboratory fee.

CHEM 3260: Mechanistic Organic Chemistry Laboratory
Co-requisite: CHEM 3264 Mechanistic Organic Chemistry.

CHEM 3264: Mechanistic Organic Chemistry
Prerequisite: A grade of C or better in CHEM 3254 Fundamentals of Organic Chemistry or equivalent.
Co-requisite: CHEM 3260 Mechanistic Organic Chemistry Laboratory.
A continuation of CHEM 3254 Fundamentals of Organic Chemistry with special emphasis on theory and mechanisms of organic reactions.
Lecture three hours, laboratory three hours. $40 laboratory fee.

CHEM 3301: Chemistry Seminar
Offered: Fall
Prerequisite: Junior Standing
Participants will prepare written reviews, present oral reports, and defend their reports. Emphasis will be on the use of the library and current chemical research.

CHEM 3313: Environmental Chemistry
Offered: Spring
Prerequisite: A grade of C or better in CHEM 3254 Fundamentals of Organic Chemistry
An examination of the chemistry of the environment including the origins, natural processes, and anthropogenic influences.

CHEM 3324: Physical Chemistry I
Offered: Fall
Prerequisites: A grade of C or better in CHEM 3254 Fundamentals of Organic Chemistry, PHYS 2114 Calculus-Based Physics I, and MATH 2924 Calculus II
A junior-level chemistry course required of all chemistry majors. Course content includes ideal and non-ideal gases, laws of thermodynamics, enthalpy, entropy, heat capacity, free energy, Maxwell's relations, activities, phase and chemical equilibria, electrochemistry, colligative properties, kinetic theory of gases, statistical mechanics, classical kinetics and mechanisms.
Lecture 3 hours, laboratory 3 hours. $40 laboratory fee.

CHEM 3334: Physical Chemistry II
Offered: Spring, alternating years
Prerequisite: A grade of C or better in CHEM 3324 Physical Chemistry I
Continuation of CHEM 3324 Physical Chemistry I. Early and modern quantum theory, wave mechanics and the Schrödinger wave equation, valence bond theory, molecular orbital (MO) theory, computational chemistry, group theory and molecular symmetry, vibrational and rotational spectroscopy.
Lecture 3 hours, laboratory 3 hours. $40 laboratory fee.

CHEM 3340: Principles of Biochemistry Laboratory
Co-requisite: CHEM 3344 Principles of Biochemistry.

CHEM 3344: Principles of Biochemistry
Prerequisites: A grade of C or better in CHEM 3264 Mechanistic Organic Chemistry and BIOL 1014 Introduction to Biological Science or 1114.
Co-requisite: CHEM 3340 Principles of Biochemistry Laboratory.
The chemistry of metabolism of carbohydrates, lipids, and proteins. Basic concepts of the biochemistry of DNA, vitamins, enzymes, biological oxidations, and bioenergetics with introduction to biochemical laboratory techniques.
Lecture three hours, laboratory three hours. $40 laboratory fee.

CHEM 3353: Fundamentals of Toxicology
Cross-listed: BIOL 3353 Fundamentals of Toxicology
Offered: On demand
Prerequisite: CHEM 3254 Fundamentals of Organic Chemistry
An introduction to the science of poisons. Toxicological principles studied include structures, dose/response relationships, metabolism, mechanism of action, and gross effects of chemicals.

CHEM 3363: Metabolic Biochemistry
Offered: Spring
Prerequisite: grade of C or better in CHEM 3344 Principles of Biochemistry
The study of metabolism of carbohydrates, lipids, proteins, and nucleic acids, and the study of biological information flow in organisms. Metabolic pathways and genetic informational flow in plants and animals will be addressed.

CHEM 3423: Descriptive Inorganic Chemistry
Offered: Fall
Prerequisite: A grade of C or better in CHEM 2134 General Chemistry II
Basic descriptive inorganic chemistry dealing in a systematic way with the elements and the structures, properties and reactions of their inorganic compounds. Topics range from coordination chemistry to organometallic chemistry to bioinorganic chemistry.

CHEM 3991: Special Problems in Chemistry
Prerequisite: Permission of instructor
One to three credits, depending on the nature and extent of the problem. This course is designed to encourage creative, independent scientific activity on the part of advanced students. Problems will be designed to fit the future aspirations of individual students and will be supervised by a faculty mentor. $40 laboratory fee.

CHEM 3992: Special Problems in Chemistry
Prerequisite: Permission of instructor
One to three credits, depending on the nature and extent of the problem. This course is designed to encourage creative, independent scientific activity on the part of advanced students. Problems will be designed to fit the future aspirations of individual students and will be supervised by a faculty mentor. $40 laboratory fee.

CHEM 3993: Special Problems in Chemistry
Prerequisite: Permission of instructor
One to three credits, depending on the nature and extent of the problem. This course is designed to encourage creative, independent scientific activity on the part of advanced students. Problems will be designed to fit the future aspirations of individual students and will be supervised by a faculty mentor.
$40 laboratory fee.

CHEM 4111: Environmental Seminar
Cross-listed: BIOL 4111 Environmental Seminar, GEOL 4111 Environmental Seminar
A seminar for students pursuing the environmental option of chemistry, biology, or geology and other students interested in environmental sciences.

CHEM 4401: Chemistry Seminar
Offered: Spring
Prerequisite: A grade of C or better in CHEM 3301 Chemistry Seminar and senior status
Participants will prepare written reviews, present oral reports, and defend their reports. Emphasis will be on the use of the library and current chemical research.

CHEM 4414: Instrumental Analysis
Offered: Fall
Prerequisite: A grade of C or better in CHEM 3245 Quantitative Analysis
This course is designed for chemistry majors. It will focus on the understanding of the instrumental methods used in analytical chemistry. A variety of spectrometric, chromatographic, and electrometric techniques will be covered in the lecture and laboratory.
Lecture three hours, laboratory three hours. $40 laboratory fee.

CHEM 4424: Advanced Inorganic Chemistry
Offered: Spring, alternating years
Prerequisite: A grade of C or better in CHEM 3423 Descriptive Inorganic Chemistry
CHEM 4424 Advanced Inorganic Chemistry is a senior level inorganic chemistry course. The course gives an overview of some of the many advanced areas of study in inorganic chemistry including atomic and molecular structure, acid-base chemistry, symmetry and group theory, coordination chemistry and organometallic chemistry.
Lecture three hours, laboratory three hours. $40 laboratory fee

CHEM 4433: Advanced Topics in Chemistry
Offered: On demand
Prerequisite: Permission of instructor.
Various advanced topics in any specialty area of chemistry, e.g., polymers, coordination chemistry, and nuclear chemistry.
Note: May be taken for duplicate credit if topic varies.

CHEM 4951: Undergraduate Research in Chemistry
Offered: On demand
Prerequisite: Departmental approval
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
$40 laboratory fee.

CHEM 4952: Undergraduate Research in Chemistry
Offered: On demand
Prerequisite: Departmental approval
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
$40 laboratory fee.

CHEM 4953: Undergraduate Research in Chemistry
Offered: On demand
Prerequisite: Departmental approval
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
$40 laboratory fee.

CHEM 4954: Undergraduate Research in Chemistry
Offered: On demand
Prerequisite: Departmental approval
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.

$40 laboratory fee.

CHEM 4991: Special Problems in Chemistry

Prerequisite: Permission of instructor.
One to four credits, depending on the nature and extent of the problem. This course is designed to encourage creative, independent scientific activity on the part of advanced students. Problems will be designed to fit the future aspirations of individual students and will be supervised by a faculty mentor. $40 laboratory fee.

CHEM 4992: Special Problems in Chemistry

Prerequisite: Permission of instructor.
One to four credits, depending on the nature and extent of the problem. This course is designed to encourage creative, independent scientific activity on the part of advanced students. Problems will be designed to fit the future aspirations of individual students and will be supervised by a faculty mentor. $40 laboratory fee.

CHEM 4993: Special Problems in Chemistry

Prerequisite: Permission of instructor.
One to four credits, depending on the nature and extent of the problem. This course is designed to encourage creative, independent scientific activity on the part of advanced students. Problems will be designed to fit the future aspirations of individual students and will be supervised by a faculty mentor. $40 laboratory fee.

CHEM 4994: Special Problems in Chemistry

Prerequisite: Permission of instructor.
One to four credits, depending on the nature and extent of the problem. This course is designed to encourage creative, independent scientific activity on the part of advanced students. Problems will be designed to fit the future aspirations of individual students and will be supervised by a faculty mentor. $40 laboratory fee.