CHEMISTRY (CHEM)

CHEM 103 Introduction to Chemistry
For students with limited background in chemistry to prepare them to continue study in chemistry and science. Lab included. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 201 General Chemistry I
Prerequisite: Completion of high school chemistry or CHEM 103 Completion of or concurrent enrollment in a Quantitative Reasoning course.. Beginning course for science and pre-health science students. Chemical calculations, atomic and molecular structure, chemical and physical properties, and chemical bonding theories. Lab involves quantitative chemical relationships. Lab included. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 5

CHEM 202 General Chemistry II
Prerequisite: Completion of CHEM 201
Continuation of 201. Thermochemistry, chemical equilibrium and kinetics, acid-base properties, electrochemistry, etc. Lab involves qualitative chemical analysis. Lab included. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 5

CHEM 230 Analytical Chemistry I
Prerequisite: Completion of CHEM 202
Introduces analytical chemistry by means of gravimetric, volumetric, and instrumental analyses. Lab techniques of analysis and chemical calculations. Lab included. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 280 Topics in Modern Chemistry
Selected topics of current interest in chemistry and biochemistry. Emphasizes problems of social significance, such as antibiotics, pesticides, drugs, food additives, and pollution. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 303 Energy Issues
Introduces energy concepts, resources, technologies, planning, and related environmental and chemical topics. Includes heat and electricity, chemical production, solar energy, photochemical smog, water and waste treatment, recycling, greenhouse effect, and population. Also NASC 303 and PHYS 303. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 311 Organic Chemistry I
Prerequisite: Completion of CHEM 201 and CHEM 202
Synthesis, structure, reactivity, reaction mechanisms, and organic spectroscopy. Lab includes synthesis and organic analysis, using separations. IR, NMR Spectra. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 5

CHEM 312 Organic Chemistry II
Continuation of 311. Includes introductory molecular orbital calculations and Woodward Hoffman rules. Lab included. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 5

CHEM 314 Biochemistry
Prerequisite: Completion of CHEM 311
Introduces biochemical diversity and function, as well as metabolism. Covers all major catabolic and anabolic pathways, including synthesis of major groups of secondary metabolites. Enzymology and control mechanisms are introduced along with signaling pathways, biochemical "machines" and other complexes. A comprehensive lab is included. Also BIOL 314. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 5

CHEM 315 Advanced Biochemistry
Prerequisite: Completion of BIOL 314 or CHEM 314
An in-depth examination of biochemistry, thermodynamics, reaction mechanisms, regulation of gene expression, metabolic pathways, and special topics. Also BIOL 315. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 320 Physical Chemistry for Life Sciences
Prerequisite: Completion of CHEM 202, MATH 201, and PHYS 201 or PHYS 203
This physical chemistry course is designed for students interested in minoring in chemistry or majoring in biology. The topics discussed include thermodynamics, chemical kinetics, electrochemistry, quantum chemistry, chemical bonding, and spectroscopy. The course introduces the basic concepts of physical chemistry within the context of biological systems and emphasizes how physical chemistry provides insight into modern biochemical and biological problems. Letter grade only. Not challengeable.

Semester Hours: 4

CHEM 370 Chemistry Seminar
This course consists of attendance and participation in weekly meetings and seminars. Topics include: research methods, literature review, and career and graduate school opportunities. Students will be guided through the process of selecting a senior project, conducting relevant literature searches and preparing a senior project proposal with research advisors. Students will participate in a journal club in which they find a research article to review and present to the class, so their scientific presentation skills are improved. Credit/No Credit only. May be taken a total of 4 times for credit. Not challengeable.

Semester Hours: 1

CHEM 409 Special Topics in Chemistry
Prerequisite: Completion of CHEM 202 and CHEM 312
Special topics in chemistry is a course that deals with specific topics or special fields of study in chemistry. Letter grade only. Not challengeable.

Semester Hours: 4

CHEM 411 Physical Chemistry I
Prerequisite: Completion of CHEM 202, MATH 201, MATH 202, PHYS 201 and PHYS 202
Laws of thermodynamics as applied to physiochemical systems. Introduces statistical mechanics. Chemical dynamics including molecular kinetic theory and chemical kinetics. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 412 Physical Chemistry II
Prerequisite: Completion of CHEM 411
Introduces quantum mechanics, symmetry, group theory, atomic and molecular structure, and chemical bonding. Lab included. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 420 Environmental Chemistry
Prerequisite: Completion of CHEM 202
Deals with the theory and technology of the environmental chemistry of air, soil, and water. Covers water and waste water treatment and specific technologies for assessing and dealing with heavy metals, organics, and radioactive pollutants. Includes Lab in standard EPA and other methods using GC, GC-MS, HPLC, and societal impact of pollution. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 430 Instrumental Methods of Analysis
Prerequisite: Completion of CHEM 230 and CHEM 311
Surveys modern instrumental methods of analysis. Analytical and spectroscopy labs. Lab included.

Grade Mode: Letter, Credit/No Credit, Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 440 Inorganic Chemistry
Prerequisite: Completion of CHEM 202
Chemistry of the elements and their compounds. Relation of structure and bonding to chemical reactivity. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 441 Materials Chemistry
Prerequisite: CHEM 440
The application of chemical principles to problems in material discovery, design, and characterization. Letter grade only. Not challengeable.

Semester Hours: 4

CHEM 445 Organometallic Chemistry
Prerequisite: Completion of CHEM 440
The course explores the interaction between organic compounds and metals. This course covers the synthesis, structure, and reactivity of organometallic compounds, as well as their applications in organic synthesis, catalysis, and materials science. Letter grade only. Not challengeable.

Grade Mode: Letter, Letter
Semester Hours: 4

CHEM 450 Advanced Organic Chemistry
Prerequisite: Completion of CHEM 311 and CHEM 312
Selected topics, such as physical organic, reaction mechanisms, and stereochemistry. Not challengeable.

Grade Mode: Letter, Credit/No Credit, Audit
Semester Hours: 4

CHEM 498 Chemistry Research
Prerequisite: CHEM 370
In this course, students will start their senior research project guided by a faculty mentor in the chemistry department. Progress reports, project outlines, presentations will be required depending on the research advisor. Letter grade only. Not challengeable.

Semester Hours: 2

CHEM 499 Senior Seminar/Project
Culminating activity required by majors in all departments. Papers/theses/projects researched, prepared, and written under the guidance of a faculty member. Comprehensive exams or recitals required in some departments. Academically, Students must be in Good Standing to enroll in 499. Can be taken for letter grade only. Not challengeable.

Semester Hours: 4