Chemistry Courses

CHEM 1100 Consumer Chemistry (3 credits)
Chemistry as viewed through illustrations taken from common substances, objects, and processes in the world around us. Topics range from table salt to perception-altering drugs, and from drinking water to nuclear power. Intended for nonscience majors. Liberal Education Goal Area 3.

CHEM 1110 Chemistry for Allied Health (3 credits)
Survey of concepts in general and organic chemistry and biochemistry. Laboratory component introduces techniques, methods, and instrumentation. Intended for students majoring in Nursing and other allied health disciplines.

CHEM 1111 General Chemistry I (4 credits)
A survey of chemistry covering basic concepts including inorganic, organic, and biochemistry. The laboratory component introduces techniques, methods, and instrumentation. Liberal Education Goal Area 3 (LC). If on-campus student must register for CHEM 1111 (Lecture) and CHEM 1171 (Lab).

CHEM 1112 General Chemistry II (4 credits)
A continuation of the survey begun in chemistry 1111 covering basic concepts of inorganic, organic, and biochemistry. The laboratory component introduces techniques, methods, and instrumentation. Prerequisite: CHEM 1111 or CHEM 2211. Liberal Education Goal Area (LC).

CHEM 1921 Directed Group Study (3 credits)
Arranged group study.

CHEM 2130 Chemistry of Drugs (3 credits)
Introduction to the pharmacology of the more common drugs and toxic substances.

CHEM 2210 Criminalistics (3 credits)
Introduction to the theory and practice of physical evidence analysis. Topics include firearms, fingerprints, hairs and fibers, numbers restoration, shoeprints, arson, and paints. Prerequisites: CHEM 1111 or CHEM 2211.

CHEM 2211 Principles of Chemistry I (4 credits)
Principles of inorganic, physical, solution, and gas phase chemistry. The laboratory component introduces techniques, methods, and instrumentation. Intended for chemistry majors and minors, biology majors, preprofessional students, and open to any student meeting the prerequisites wishing to fulfill their Liberal Education requirement. Liberal Education Goal Area 3 (LC). If on-campus student must register for CHEM 2211 (Lecture) and CHEM 2271(Lab).

CHEM 2212 Principles of Chemistry II (4 credits)
Continuation of the development of principles of inorganic, physical, solution, and gas phase chemistry begun in CHEM 1211. The laboratory component introduces techniques, methods, and instrumentation. Intended for chemistry majors and minors, biology majors, preprofessional students, and open to any student meeting the prerequisites wishing to fulfill their Liberal Education requirement. Prerequisite: CHEM 1111 or CHEM 2211. Liberal Education Goal Area 3 (LC). Student must register for CHEM 2212 (Lecture) and CHEM 2272 (Lab).

CHEM 2270 Criminalistics Laboratory (1 credit)
Introduction to the analyses performed in forensic chemistry. Corequisite: CHEM 2210.

CHEM 2925 People of the Environment: Chemistry Perspective (3 credits)
A study of the chemical processes important in maintaining a clean environment. Liberal Education Goal Area 10.

CHEM 3076 Biochemical Techniques (2 credits)
This course is one of two options for completion of the techniques core requirement for the BCMB major. Includes some basic biochemical techniques, but introduces more advanced biochemical laboratory experiments. Prerequisite(s): CHEM 4471 or BCMB 3074 or BIOL 3074.

CHEM 3100 Journal Club (1 credit)
Oral and written presentations of special topics in chemistry. May be repeated with 2 semester credits allowed toward chemistry major. Prerequisite: CHEM 3312.

CHEM 3110 Laboratory Management and Safety (2 credits)
Laboratory management concepts, safety information concerning chemical substances. Prerequisite: Junior or Senior standing.

CHEM 3140 Chemical Toxicology (3 credits)
Chemical principles in toxicology. Design of environmentally safer chemicals; quantitative analysis of the toxicity of various molecules. Prerequisite: CHEM 3311.

CHEM 3150 Standard Methods of Water Analysis (3 credits)
Introduction to techniques of analysis of natural and effluent water samples using standard analytical techniques. Prerequisite: CHEM 1112 or CHEM 2212.

CHEM 3210 Interpretation of Spectral Data (2 credits)
Systematic identification of chemical structures utilizing data from mass spectrometry, infrared spectroscopy, and nuclear magnetic resonance spectroscopy. Prerequisites: CHEM 3312 or CHEM 3372 (may be co-requisite).

CHEM 3311 Organic Chemistry I (3 credits)
A study of the properties of aliphatic and aromatic compounds and the theories and mechanisms to account for those properties. Prerequisite: CHEM 1112 or CHEM 2212.

CHEM 3312 Organic Chemistry II (3 credits)
Continuation of study of the properties of functional groups and the theories and mechanisms to account for those properties. Prerequisite: CHEM 3311.

CHEM 3371 Organic Chemistry Laboratory I (1 credit)
Laboratory study of the reactions of organic compounds. Prerequisites: CHEM 1112 or CHEM 2212; Corequisite CHEM 3311.

CHEM 3372 Organic Chemistry Laboratory II (1 credit)
Laboratory study of the reactions of organic compounds. Prerequisite: CHEM 3371; Corequisite CHEM 3312.

CHEM 3507 Analytical Chemistry (3 credits)
A study of equilibrium processes and the experimental methods and instruments used for quantitative analysis of samples. Prerequisite: CHEM 1112 or CHEM 2212.

CHEM 3570 Analytical Chemistry Laboratory (1 credit)
Laboratory applications of analytical instrumentation to chemical analysis. Prerequisites: CHEM 1112 or CHEM 2212, CHEM 3507 (may be corequisite).

CHEM 3970 Internship (3 credits)
Graded Satisfactory/Unsatisfactory only. Student internships may be either full-time or part-time in a public or private agency appropriate to the degree objective. Internships consist of closely supervised periods of service that are arranged in advance of the course registration. Students should consult their advisor concerning prerequisites.

CHEM 3980 Research (1 credit)
Research carried out by the student that is based on appropriate methodology and scholarship.

CHEM 4110 Environmental Chemistry (3 credits)
Intensive study of biogeochemical cycles of natural and man-made pollutants including transformations, transport, fate and persistence mechanisms. Environmental effects, long-term impacts, and methods of treatment/prevention are discussed. Prerequisites: CHEM 1112 or CHEM 2212 or consent of instructor.

CHEM 4320 Special Topics in Organic Chemistry (1-3 credits)
Selected topics such as advanced synthesis, advanced reaction mechanisms, polymers, and natural products. May be repeated when topic is changed. Prerequisite: CHEM 3312. Might not be offered every year.

CHEM 4411 Biochemistry I (3 credits)
Chemical principles governing metabolic functions and genetics. Prerequisites: CHEM 3312 or consent of instructor.

CHEM 4412 Biochemistry II (3 credits)
Continuation of CHEM 3411. Chemical principles governing metabolic functions and genetic materials. Prerequisite: CHEM 4411.

CHEM 4420 Special Topics in Biochemistry (1-3 credits)
Selected topics such as carbohydrates, lipids, proteins, enzymology, nucleic acids, metabolism, toxicology, and biochemical lab techniques. May be repeated when topic is changed. Prerequisite: CHEM 3312. Might not be offered every year.

CHEM 4471 Biochemistry Laboratory I (1 credit)
Laboratory techniques pertaining to biochemistry. Prerequisites: CHEM 3312 and CHEM 3372, Corequisite: CHEM 4411.

CHEM 4472 Biochemistry Laboratory II (1 credit)
Continuation of laboratory techniques pertaining to biochemistry. Prerequisites: CHEM 4411; Corequisite: CHEM 4412.

CHEM 4510 Instrumental Methods of Analysis (3 credits)
Theory and applications of instrumental methods of chemical analysis. Prerequisite: CHEM 3507 and CHEM 3570.

CHEM 4520 Special Topics in Analytical Chemistry (1-3 credits)
Selected topics such as mass spectrometry, NMR, electrochemistry, chemical separations, and computerized instrument interfaces. Prerequisite: CHEM 3507. Might not be offered every year.

CHEM 4571 Instrumental Analysis Laboratory I (1 credit)
Experimental applications of instrumental methods of chemical analysis. Corequisite: CHEM 4510.

CHEM 4572 Instrumental Analysis Laboratory II (1 credit)
Continuation of CHEM 4571. Experimental applications of instrumental methods of chemical analysis. Prerequisite: CHEM 4510.

CHEM 4614 Medicinal Chemistry: Drug Design (3 credits)
This course focuses on drug design and development, as well as the absorption, distribution, metabolism and excretion of drug molecules. Organic chemistry principles vital to drug synthesis and case studies of clinically relevant drugs will be incorporated. Prerequisite(s): CHEM 3312.

CHEM 4615 Medicinal Chemistry: Drug Action (3 credits)
This course focuses on drug targets such as enzymes, receptors, and nucleic acids and the mechanisms by which pharmaceuticals alter the normal cellular activity. Common classes of pharmaceuticals (antibacterial, antiviral, anticancer, opioids, etc) will be explored. Progress in pharmaceutical development will be highlighted through the incorporation of current literature article and drugs undergoing clinical trials. Prerequisite(s): CHEM 4411.

CHEM 4711 Physical Chemistry I (3 credits)
Fundamental understanding of chemical and physical properties of atoms and molecules through quantum mechanical and classical approaches. Prerequisites: CHEM 2212 and PHYS 2101.

CHEM 4712 Physical Chemistry II (3 credits)
Fundamental understanding of chemical and physical properties of atoms and molecules through quantum mechanical and classical approaches. Prerequisites: CHEM 4711 or consent of instructor.

CHEM 4720 Special Topics in Physical Chemistry (1-3 credits)
Selected topics such as kinetics, thermodynamics, quantum chemistry, and molecular modeling. Prerequisite: CHEM 3312. Might not be offered every year.

CHEM 4771 Physical Chemistry Laboratory I (1 credit)
Physical chemistry laboratory applications. Prerequisites: CHEM 3570; Corequisite: CHEM 4711.

CHEM 4772 Physical Chemistry Laboratory II (1 credit)
Physical chemistry laboratory applications. Continuation of 3771. Prerequisites: CHEM 3570; Corequisite: CHEM 4712.

CHEM 4811 Advanced Inorganic Chemistry I (3 credits)
Theoretical approach to the principles of inorganic chemistry. Integration of theory and descriptive chemistry. Corequisite: CHEM 3312.

CHEM 4812 Advanced Inorganic Chemistry II (3 credits)
Continuation of the study of the theoretical approaches to the principles of inorganic chemistry. Prerequisite: CHEM 4712 and CHEM 4811.

CHEM 4820 Special Topics in Inorganic Chemistry (1-3 credits)
Selected topics such as organometallics, catalysis, bioinorganic chemistry, and materials chemistry. Prerequisite: CHEM 3312. Might not be offered every year.

CHEM 4871 Inorganic Chemistry Laboratory I (1 credit)
Laboratory oriented approach emphasizing techniques and theories of preparative inorganic chemistry. Prerequisite: CHEM 4711.

CHEM 4872 Inorganic Chemistry Laboratory II (1 credit)
Laboratory oriented approach emphasizing techniques and theories of preparative inorganic chemistry. Prerequisite: CHEM 4871.

CHEM 4894 Research I (2 credits)
This research experience in chemistry will develop essential skills needed to be a chemist. Student researchers will formulate questions, utilize concepts and techniques learned in the classroom, and analyze arguments. Presentations and papers will communicate findings. Prerequisite(s): Junior status and consent of instructor.

CHEM 4895 Research II (2 credits)
This second course in a two course research sequence in chemistry will continue to develop essential skills needed to be a chemist. Student researchers will formulate questions, utilize concepts and techniques learned in the classroom, and analyze arguments. Presentations and papers will communicate findings. Prerequisite(s): CHEM 4894, Junior status and consent of instructor.

CHEM 4970 Internship (3-4 credits)
Graded Satisfactory/Unsatisfactory only. Student internships may be either full-time or part-time in a public or private agency appropriate to the degree objective. Internships consist of closely supervised periods of service that are arranged in advance of the course registration. Students should consult their advisor concerning prerequisites.

CHEM 4980 Research (3 credits)
Research carried out by the student that is based on appropriate methodology and scholarship.

All-University Courses

The course numbers listed below, not always included in the semester class schedule, may be registered for by consent of the advisor, instructor, or department chair, or may be assigned by the department when warranted. Individual registration requires previous arrangement by the student and the completion of any required form or planning outline as well as any prerequisites.

1910, 2910, 3910, 4910 DIRECTED INDEPENDENT STUDY
1920, 2920, 3920, 4920 DIRECTED GROUP STUDY
1930, 2930, 3930, 4930 EXPERIMENTAL COURSE
1940, 2940, 3940, 4940 IN-SERVICE COURSE
1950, 2950, 3950, 4950 WORKSHOP, INSTITUTE, TOUR
1960, 2960, 3960, 4960 SPECIAL PURPOSE INSTRUCTION
1970, 2970, 3970, 4970 INTERNSHIP
1980, 2980, 3980, 4980 RESEARCH
1990, 2990, 3990, 4990 THESIS