

CHEMISTRY (CHEM)

Courses

CHEM 111 Physical Basis Of Chemistry Credits: 3

An introductory course in the basic principles applicable to chemistry for students who intend to take but are not adequately prepared to take CHEM 211. The emphasis is on quantitative relationships and problem solving. NOTE: This course does not count towards a Chemistry major or minor.

Prerequisites: Departmental consent.

CHEM 115 Elements Of Chemistry I Credits: 4

A one-term course in general chemistry with special emphasis on organic chemistry and biochemistry. A terminal course that does not meet requirements as a prerequisite for any higher level chemistry course. NOTE: This course does not count towards a Chemistry major or minor.

Co-requisites: CHEM 115L.

CHEM 115L Elements Of Chemistry, Laboratory I Credit: 1

A one-term course in general chemistry with special emphasis on organic chemistry and biochemistry. A terminal course that does not meet requirements as a prerequisite for any higher level chemistry course. NOTE: This course does not count towards a Chemistry major or minor.

Co-requisites: CHEM 115.

CHEM 115L - MOTR CHEM 100L: Essentials in Chemistry with Lab



CHEM 160 Chemistry, Society, And The Environment Credits: 3

This course is intended to offer a survey of chemical and scientific concepts surrounding current issues. The emphasis will be on the application of fundamental chemical knowledge to allow a full understanding of these issues in the context of currently known facts and theories. Through classroom discussion and application of the scientific method, the ramifications of the issues will be examined. Topics will include pollution, the importance of the chemical industry, its responsibilities to society, and other items of current scientific and environmental interest. NOTE: This course does not count towards a Chemistry major or minor.

CHEM 160 - MOTR CHEM 100L: Essentials in Chemistry with Lab



CHEM 160L Laboratory For Chemistry, Society, And The Environment Credit: 1

This course is offered in support of CHEM 160. It will consist of field activities, experiments, and demonstrations to reinforce the concepts and ideas presented in that course. NOTE: This course does not count towards a Chemistry major or minor.

CHEM 160L - MOTR CHEM 100L: Essentials in Chemistry with Lab



CHEM 206 Human Nutrition Credits: 3

Introduction to nutrition for health and wellness and the use of chemical energy in the breakdown and synthesis of biomolecules. Nutrition as it applies to a variety of life situations from infancy to older adults. Learning encompasses elements of anatomy and physiology related to nutrition and health. NOTE: This course does not count towards a Chemistry major or minor.

CHEM 206 - MOTR LIFS 100N: Essentials in Human Biology - Nutr



CHEM 211 General Chemistry I Credits: 4

Stoichiometry, gas laws, thermochemistry, atomic structure, molecular shapes and bonding theories. Recommended preparation: working knowledge of College Algebra.

Co-requisites: CHEM 211L.

CHEM 211 - MOTR CHEM 150L: Chemistry I with Lab



CHEM 211L Experimental General Chemistry I Credit: 1

Introduction to the laboratory techniques used in studying the chemical properties of substances. Some quantitative techniques are included.

Co-requisites: CHEM 211.

CHEM 211L - MOTR CHEM 150L: Chemistry I with Lab



CHEM 212LR Experimental General Chemistry II Credit: 1

Introduction to analysis and synthesis. Descriptive chemistry of the more common elements.

Prerequisites: CHEM 211 and CHEM 211L (each with a grade of C- or better).

Co-requisites: CHEM 212R.

CHEM 212R General Chemistry II Credits: 4

Liquids and solids, solutions, equilibrium, kinetics, electrochemistry and thermodynamics. Introductory course to all advanced work in chemistry.

Prerequisites: CHEM 211 and CHEM 211L (each with a grade of C- or better).

Co-requisites: CHEM 212LR.

CHEM 311 Laboratory Safety And Health I Credit: 1

An introduction to laboratory safety and health. Topics to be discussed include good laboratory practice; laboratory hazards; safe chemical handling, storage and disposal; first aid; protective equipment; and federal regulations.

Prerequisites: CHEM 320 or CHEM 321.

CHEM 320 Elementary Organic Chemistry Credits: 4

This one-semester course covers all fundamental principles of organic chemistry, including modern bonding theory, analytical techniques, physical properties, and chemical reactions. This course is designed to satisfy requirements for students in the UMKC Six-Year Medical Program or certain Biology B.A. majors. This course is not recommended for pre-medical, pre-dental, pre-pharmacy or other pre-health students.

Prerequisites: CHEM 212R and CHEM 212LR (each with a grade of C- or better).

Co-requisites: CHEM 320L.

CHEM 320L Experimental Organic Chemistry Credit: 1

Elementary organic chemistry experiments to teach basic laboratory operations.

Prerequisites: CHEM 212R and CHEM 212LR (each with a grade of C- or better).

Co-requisites: CHEM 320.

CHEM 321 Organic Chemistry I Credits: 3

The two terms (CHEM 321, CHEM 322R) constitute an integrated unit in which the chemistry of aliphatic, aromatic, and some heterocyclic compounds are studied. The study begins with simple monofunctional compounds and ends with polyfunctional natural products.

Prerequisites: CHEM 212R and CHEM 212LR (each with a grade of C- or better).

Co-requisites: CHEM 321L.

CHEM 321L Organic Chemistry Laboratory I Credit: 1

Introduces the student to basic techniques and procedures in isolation, purification, and characterization of organic compounds and simple reactions used in the organic chemistry laboratory. The student will also be trained in the proper way to write a scientific laboratory report.

Prerequisites: CHEM 212R and CHEM 212LR (each with a grade of C- or better).

Co-requisites: CHEM 321.

CHEM 322L Organic Chemistry Laboratory II Credit: 1

An extension of CHEM 321L. This course builds from the basic techniques, procedures, and writing to more advanced organic operations.

Co-requisites: CHEM 322R.

CHEM 322R Organic Chemistry II Credits: 3

Continuation of CHEM 321.

Prerequisites: CHEM 321 and CHEM 321L (each with a grade of C- or better).

Co-requisites: CHEM 322L.

CHEM 330 Elementary Physical Chemistry Credits: 3

An introductory course in the principles of physical chemistry for students who have not had calculus.

Prerequisites: CHEM 320 or CHEM 322R (each with a grade of C- or better).

CHEM 341 Analytical Chemistry I: Quantitative Analysis Credits: 4

Principles of gravimetric, volumetric, electrolytic, and other methods of analysis.

Prerequisites: CHEM 212R (with a grade of C- or better).

CHEM 341WI Analytical Chemistry I: Quantitative Analysis Credits: 4

Principles of gravimetric, volumetric, electrolytic, and other methods of analysis.

Prerequisites: ENGLISH 225, CHEM 212R and CHEM 212LR (each with a grade of C- or better).

CHEM 345R Instrumental Analysis Credits: 3

An introductory course on the use of instruments for chemical analysis with particular reference to applications of interest to medical technologists and other students in the sciences. Emphasis will be placed on optical, electrochemical and separation methods.

Prerequisites: CHEM 341WI (with a grade of C- or better).

CHEM 350 Undergraduate Learning Assistant in Chemistry Credits: 3

This course addresses current issues and pedagogy of teaching chemistry and providing instructional support for designated undergraduate chemistry courses. Students meet weekly with the course instructor and assist inside the laboratory, classroom, or by leading small discussion groups.

Prerequisites: CHEM 212R and CHEM 212LR and departmental consent.

CHEM 367 Bioorganic Chemistry Credits: 3

An examination into the current topics at the interface between chemistry and biology. Emphasis will be on the current literature and will include such topics as nucleic acid chemistry, protein chemistry, and carbohydrate chemistry.

Prerequisites: CHEM 320 and CHEM 320L; or CHEM 322R and CHEM 322L (each with a grade of C- or better).

CHEM 382 Inorganic And Organic Synthesis Credits: 2

A number of inorganic, organic, and organometallic compounds will be prepared using a variety of synthetic techniques.

Prerequisites: CHEM 320 and CHEM 320L; or CHEM 322R and CHEM 322L (each with a grade of C- or better).

CHEM 387 Environmental Chemistry I Credits: 3

A survey of how chemical principles can be applied to the environment. Included will be topics in aquatic chemistry, atmospheric chemistry and chemistry of the geosphere and soil.

Prerequisites: CHEM 320 and CHEM 320L; or CHEM 322R and CHEM 322L (each with a grade of C- or better).

CHEM 390 Special Topics In Chemistry Credits: 1-3

This course will focus on an area of chemistry of contemporary significance. The amount of credit is to be determined by arrangement with the department. May be repeated for credit when the topic varies but no more than three hours of credit may be applied to major course requirements.

Recommended preparation: CHEM 212R and CHEM 212LR (each with a grade of C- or better).

Prerequisites: Departmental consent.

CHEM 392 Chemistry Internship/Practical Training Credits: 1-3

Practical work in chemistry in an industrial, academic or other professional setting. Prior to the start of work, the department must approve the internship/practical training.

Prerequisites: CHEM 212R and CHEM 212LR (each with a C- or better).

CHEM 395 Directed Readings In Chemistry Credits: 1-3

Intensive readings in areas of joint interest to the enrolled student and the cooperating faculty member. Readings may not duplicate or substitute for current course offerings. Recommended preparation: CHEM 322R and CHEM 322L (each with a grade of C- or better).

Prerequisites: Departmental consent.

CHEM 399 Intro To Research Credits: 1-3

Special problems to introduce undergraduate chemistry majors to research methods. A comprehensive written report is required and a copy of the report is to be retained in the chemistry office. Recommended preparation: CHEM 212R and CHEM 212LR (each with a grade of C- or better).

Prerequisites: Departmental consent.

CHEM 410 Chemical Literature Credit: 1

A systematic introduction to the physical and electronic sources of chemical information and literature, and their efficient use, is presented. Both classical and computer informational search methods will be addressed, and selected topics in the history of chemistry and technology, the development of chemical and physical theory, intellectual property, and the philosophy of science may be included.

Prerequisites: CHEM 320 and CHEM 320L; or CHEM 322R and CHEM 322L (each with a grade of C- or better).

CHEM 431 Physical Chemistry I Credits: 3

A first course in physical chemistry having a calculus base. This course emphasizes thermodynamics with an introduction to the basic principles of quantum mechanics.

Prerequisites: MATH 250; and PHYSICS 220 or PHYSICS 250.

CHEM 432 Physical Chemistry II Credits: 3

A second course in physical chemistry having a calculus base. This course emphasizes the quantum mechanics description of atoms and molecules, molecular spectroscopy, statistical mechanics, and kinetics.

Prerequisites: CHEM 431 (with a grade of C- or better).

Co-requisites: CHEM 437WI.

CHEM 434 Molecular Spectroscopy Credits: 3

A theoretical introduction to molecular spectroscopy and its relation to structure. Electronic, vibrational and rotational spectra of chemical systems will be discussed.

Prerequisites: CHEM 432 (with a grade of C- or better).

CHEM 437WI Experimental Physical Chemistry I Credits: 3

Experimental methods in physical chemistry. One hour lecture and six hours laboratory each week. Satisfies writing intensive requirements for the B.A. or B.S. degree.

Prerequisites: ENGLISH 225.

Co-requisites: CHEM 432.

CHEM 442R Analytical Chemistry II: Instrumental Analysis Credits: 3

The experimental and theoretical aspects of optical and electrochemical, chromatographic and other physicochemical methods of analysis.

Prerequisites: CHEM 341WI (with a grade of C- or better).

CHEM 445 Introduction To Principles Of Forensic Investigation Credits: 2

A survey of the physicochemical forensic techniques employed in the detection, examination, processing, preservation and court presentation of evidence.

Prerequisites: CHEM 212R and CHEM 212LR (each with a grade of C- or better).

CHEM 451R Inorganic Chemistry Credits: 3

Modern concepts and theories of inorganic chemistry.

Prerequisites: CHEM 320 and CHEM 320L; or CHEM 322R and CHEM 322L (each with a grade of C- or better).

CHEM 471 Introduction To Polymer Chemistry Credits: 3

Survey of organic and inorganic monomers and polymers; the occurrence, synthesis, structures and properties of natural and synthetic polymers; discussion of general properties of plastics, elastomers, fibers, resins, and plasticizers.

Prerequisites: CHEM 320 and CHEM 320L; or CHEM 322R and CHEM 322L (each with a grade of C- or better).

CHEM 478 Characterization of Macromolecules Credits: 3

Theory and laboratory characterization of macromolecules. Study and use of modern laboratory methods for separation and elucidation of structure, size, and physical properties.

Prerequisites: CHEM 322R and CHEM 322L

CHEM 480 Computer Applications To Chemical Problems Credits: 3

The course will survey the field of computational chemistry, concentrating on methods, programs and general utility to the research chemist. The student will learn the principles of the theory underlying the methods and will use selected software to carry out chemical calculations.

Prerequisites: CHEM 320 and CHEM 320L; or CHEM 322R and CHEM 322L (each with a grade of C- or better).

CHEM 490 Special Topics In Chemistry Credits: 1-3

This course will focus on an area of chemistry of contemporary significance. The amount of credit is to be determined by arrangement with the department. May be repeated for credit when the topic varies but no more than three hours of credit may be applied to major course requirements.

Prerequisites: CHEM 431 (with a grade of C- or better).

CHEM 495 Directed Readings In Chemistry Credits: 1-3

Intensive readings in areas of joint interest to the enrolled student and the cooperating faculty member. Readings may not duplicate or substitute for current course offerings. Recommended preparation: CHEM 431 with a grade of C- or better.

Prerequisites: Departmental consent.

CHEM 499 Senior Research Credits: 1-9

The student is given an original research problem and will be held responsible for all previous experience in working toward its solution. A well-written, comprehensive, and well documented research report is required, and a copy of the report is to be retained in the Chemistry department. Recommended preparation: CHEM 431 with a grade of C- or better.

Prerequisites: Departmental consent.