

CHEMISTRY

Minor

A minor must contain 15 to 18 semester hours of coursework, including at least 9 hours of upper-division courses at the 3000-4000 level. Courses taken to satisfy Core IMPACTS may not be counted toward completion of the minor. Courses taken in the Field of Study may sometimes be used to fulfill minor requirements.

A minor in Chemistry must include 15 credit hours of chemistry course work, with at least 9 hours at the 3000-level or above.

Two CHEM Electives	6
CHEM 3311K Quantitative Analysis	4
Two of the following Upper Electives:	5
CHEM 3211K Organic Chemistry I	
CHEM 3212K Organic Chemistry II	
CHEM 3312K Instrumental Methods of Analysis	
CHEM 3411K Physical Chemistry I	
CHEM 3412K Physical Chemistry II	
CHEM 3500 Biochemistry	
CHEM 3700K Environmental Chemistry	
CHEM 3900 Readings in Chemistry	
CHEM 4000 Senior Seminar	
CHEM 4110K Advanced Inorganic Chemistry	
CHEM 4120 Drug Action and Drug Design	
CHEM 4420 Adv Organic Spectroscopy	
CHEM 4430 Advanced Organic Chemistry	
CHEM 4800 Service Learning in Chemistry	
CHEM 4860 Internship in Chemistry	
CHEM 4900 Special Topics in Chemistry	
CHEM 4960 Research in Chemistry	
Total Hours	15

Courses

CHEM 1151K. Survey of Chemistry. 3-3-4 Units.

Introduces the fundamentals of chemistry including general principles of atomic structures, bonding, reactions, gases, water, solutions, pH and elementary organic chemistry and biochemistry.(S)

Prerequisites: MATH 1001, 1101, or 1111 and ENGL 0999 unless exempt.

CHEM 1211K. Principles of Chemistry I. 3-3-4 Units.

Explores the discipline of chemistry through an understanding of the basic laws and properties of matter, stoichiometry, atomic structure, chemical bonding, gas laws, solutions and the physical states of matter. Requires laboratory experimentation which illustrates applications of concepts studied in lecture.(F,S,M)

Prerequisites: MATH 1111 with a grade of "C" or better, ENGL 0999 unless exempt.

CHEM 1212K. Principles of Chemistry II. 3-3-4 Units.

Continues the exploration of the discipline of chemistry begun in CHEM 1211. Focuses on the more quantitative aspects of chemistry including chemical equilibria, kinetics, acid-base, solubility product, electrochemistry and coordination compounds. Requires laboratory development of techniques necessary to identify common metallic and non-metallic ions.(F,S,M)

Prerequisites: CHEM 1211K.

CHEM 2000. Scientific Communication. 2-0-2 Units.

An introduction to the principles of ethics in the chemical sciences. Also, the infrastructure of scientific scholarship is introduced with an emphasis on interaction with the scientific community, responsible conduct in research, and communication of scientific findings.(F)

Prerequisites: CHEM 1211K Corequisites: CHEM 1212K.

CHEM 3211K. Organic Chemistry I. 3-3-4 Units.

Introduces the chemistry of organic compounds including aliphatic and aromatic hydrocarbons, stereochemistry, monofunctional compounds and some polyfunctional compounds. Requires the illustration of techniques for synthesis, separation, purification and identification of organic compounds in the laboratory.(F,S,M)

Prerequisites: CHEM 1212K.

CHEM 3212K. Organic Chemistry II. 3-3-4 Units.

Continues the exploration of the chemistry of organic compounds with an emphasis on the characteristics and reactions of a variety of functional groups. Requires the illustration of techniques for synthesis, separation, purification and identification of organic compounds in the laboratory.(F,S,M)

Prerequisites: CHEM 3211K.

CHEM 3311K. Quantitative Analysis. 3-4-4 Units.

Introduction to statistics. The use of spreadsheets. Principles and techniques of volumetric analysis. Concepts of chemical equilibria as applied to acid-base, precipitation, and complex ion reactions. Electrochemistry and potentiometry. Introduction to spectroscopy and chromatography.(F,S)

Prerequisites: CHEM 1212K and MATH 1113.

CHEM 3312K. Instrumental Methods of Analysis. 3-3-4 Units.

Theoretical principles and uses of modern instrumental methods covering: measurement theory, atomic spectroscopy, molecular spectroscopy, mass spectrometry, electrometry, electroanalysis and chromatographic separations.(S)

Prerequisites: CHEM 3311K.

CHEM 3411K. Physical Chemistry I. 3-3-4 Units.

A study of macromolecular phenomena in terms of micro molecular concepts including the gas state and thermodynamic.(F)

Prerequisites: CHEM 1212K, MATH 2254, PHYS 1112K or PHYS 2212K.

CHEM 3412K. Physical Chemistry II. 3-3-4 Units.

A continuation of CHEM 3411K including liquid and solid state, kinetics, and equilibria.(S)

Prerequisites: CHEM 1212K, MATH 2254, and PHYS 1112K or PHYS 2212K.

CHEM 3500. Biochemistry. 3-0-3 Units.

The chemical aspects of protein, carbohydrate, lipid, and nucleic acid, and enzyme function, bioenergetics, metabolism, photosynthesis, nucleic acid function, and protein biosynthesis.(S,M)

Prerequisites: BIOL 1107K and CHEM 3211K.

CHEM 3700K. Environmental Chemistry. 3-3-4 Units.

This course will cover the environmental chemistry involving the transport, distribution, reactions, and speciation of inorganic, organometallic and organic chemicals occurring in the air, soil and water environments at the local, national and global scale. Environmental transformations and degradation processes, toxicology, pollution and hazardous substances will be discussed(F)

Corequisites: CHEM 3211K.

CHEM 3900. Readings in Chemistry. 0-0-2 Units.

Independent in-depth study of the literature within a topic of current research in Chemistry. Approval of a faculty supervisor required before registration.(F,S, M)

Prerequisites: 12 hours of Chemistry and permission of the instructor.

CHEM 4000. Senior Seminar. 2-0-2 Units.

Survey of various topics, especially highlighting the interdisciplinary nature of chemistry.(S)

Prerequisites: 12 hours of upper level chemistry.

CHEM 4110K. Advanced Inorganic Chemistry. 3-3-4 Units.

Advanced theories of bonding and structure in inorganic chemistry with emphasis on ligand field theory, bioinorganic chemistry, and organometallic chemistry(S)

Prerequisites: CHEM 3212K, CHEM 3311K.

CHEM 4120. Drug Action and Drug Design. 3-0-3 Units.

This course is intended to introduce chemistry and biology students the key concepts in medicinal chemistry that overlaps the disciplines of a variety of science fields extended from chemistry and biology. This course will primarily consist of molecular mechanisms of drug target interactions in the body and drug design strategies for improving drug action. Some discussion will be devoted to specific drug classes, but the primary focus of the course will be acquiring the chemistry and theory of general drug action and drug design. This course will include limited hands-on experience using available computer programs in medicinal chemistry. (S) Prerequisite(s): CHEM 3212K or permission of instructor.

CHEM 4420. Adv Organic Spectroscopy. 3-0-3 Units.

This course is intended to introduce the spectroscopic methods used in the modern determination of organic structures. This will primarily consist of the study of mass spectrometry (MS), infrared (IR) spectroscopy, and nuclear magnetic resonance (NMR) spectrometry. Some discussion will be devoted to instrumental methods, but the primary focus of the course will be acquiring skill in the interpretation of this spectral data. This course will include hands-on experience using instrumentation. (F even-numbered years) Prerequisites: CHEM 3212K

CHEM 4430. Advanced Organic Chemistry. 3-0-3 Units.

A study of organic reactions and mechanisms which builds on the foundations of Organic Chemistry I and II (CHEM 3211K/3212K).

Topics may include carbonyl compounds, amines, pericyclic reactions, organometallics, and synthetic polymers.(F odd-numbered years)

Prerequisites: CHEM 3212K.

CHEM 4800. Service Learning in Chemistry. 0-0-1-4 Unit.

A lecture assistantship or laboratory assistantship within a chemistry course here at Dalton State. Repeatable for a maximum of 4 credit hours. (F,S,M)

Prerequisites: Approval of both a faculty supervisor and department chair.

CHEM 4860. Internship in Chemistry. 0-0-1-4 Unit.

A supervised, credit-earning work experience of one academic semester with a previously approved business firm, private agency or government agency. Repeatable for a maximum of 4 credit hours. (F,S,M).

Prerequisites: Permission of department chair.

CHEM 4900. Special Topics in Chemistry. 0-0-1-4 Unit.

Advanced concepts in chemistry will be presented, the detailed content varying from year to year. Course may be repeated for credit when topic differs.(Offered as Needed)

Prerequisites: CHEM 1212K and permission of instructor.

CHEM 4960. Research in Chemistry. 0-0-1-4 Unit.

Research project conducted by a student under guidance of a faculty member. Variable 1-4 hours. Repeatable for a maximum of 4 hours.(F,S,M) Prerequisites: CHEM 1212K and approval of both a faculty supervisor and department chair.