
Chemistry

Chemistry is the study of the composition, structure, properties, and reactions of matter, especially of atomic and molecular systems. This major can equip a student for graduate or professional study or for entry level positions in laboratories or businesses.



REQUIREMENTS FOR A CHEMISTRY MAJOR – 33 hours, plus 18 hours of required supporting courses, including the following:

			<i>Hours</i>
CHM	131	General Chemistry I	4
CHM	132	General Chemistry II	4
CHM	220	Organic Chemistry I	4
CHM	221	Organic Chemistry II	4
CHM	250	Quantitative Analysis	4
CHM	335W	Thermodynamics	4
CHM	336	Quantum Chemistry and Kinetics	3
<i>Plus six credits from the following:</i>			6
CHM	322W	Biochemistry	3
CHM	350W	Environmental Chemistry	3
CHM	440	Inorganic Chemistry	3
TOTAL:			33 hours
<i>Plus required supporting courses outside of the major area:</i>			
MAT	130	Calculus with Analytical Geometry I	4
MAT	140	Calculus with Analytical Geometry II	4
PHY	220	General Physics I: Mechanics, Waves and Optics	4
PHY	230	General Physics II: Electricity, Magnetism and Modern Physics	4
S&M	200W	Methods of Science and Critical Thinking	2

REQUIREMENTS FOR A CHEMISTRY MINOR – 22 hours including the following:

			<i>Hours</i>
CHM	131	General Chemistry I	4
CHM	132	General Chemistry II	4
CHM	220	Organic Chemistry I	4
CHM	250	Quantitative Analysis	4
<i>Plus 6 or more credits at the 300-level</i>			6
TOTAL:			22 hours

REQUIREMENTS FOR A SCIENCE MAJOR (CHEMISTRY DESIGNATION) WITH TEACHER CERTIFICATION –

(1) 42 hours of coursework including the following:

			<i>Hours</i>
BIO	141W	Principles of Biology I	4
BIO	142W	Principles of Biology II	4
CHM	131	General Chemistry I	4

CHM	132	General Chemistry II	4
CHM	220	Organic Chemistry I	4
<i>Plus one of the following two courses:</i>			4
CHM	221	Organic Chemistry II	4
CHM	250	Quantitative Analysis	4
<i>Plus the following required courses:</i>			
PHS	111	Introduction to Earth Science	4
PHS	112	Introduction to Astronomy	4
PHY	220	General Physics I: Mechanics, Waves and Optics	4
PHY	230	General Physics II: Electricity, Magnetism and Modern Physics	4
S&M	200W	Methods of Science and Critical Thinking	2
TOTAL:			42 hours

Plus the following supplemental courses:

MAT 121 Precalculus 4 MAT 130 Calculus 4 MAT 140 Calculus II 4

(2) Plus Professional Education Course Requirements. (For a list of these courses, please refer to the Education section of the catalog concerning requirements for certification in Secondary Education.)

(3) To qualify for Student Teaching, a student must have an overall 2.50 GPA and a 2.75 GPA in the Science major outlined above.

Chemistry Courses

CHM 131 General Chemistry I

4 hours

Prerequisite: MAT 099R or higher, or an ACT Math score of at least 23, or placement by a divisionally designated, nationally-normed placement test (e.g. COMPASS)

Study of the nature of matter; atomic and molecular structure, chemical bonding, gas laws, chemical reactions, and stoichiometry. Lecture/laboratory.

CHM 132 General Chemistry II

4 hours

Prerequisites: CHM 131 and MAT 121.

Continuation of CHM 131 stresses the concepts of solutions, chemical equilibrium, kinetics, thermodynamics, and oxidation/reduction reactions. Lecture/laboratory.

CHM 220 Organic Chemistry I

4 hours

Prerequisite: CHM 132.

The chemistry of carbon compounds: structure, nomenclature, reactions of alkanes, alkenes, alkynes, and some functional groups. Introduction to infrared and nuclear magnetic resonance spectroscopy. Lecture/laboratory.

CHM 221 Organic Chemistry II**4 hours***Prerequisite: CHM 220.*

A continuation of CHM 220 with emphasis on more complex organic reactions, including the chemistry of aromatic rings and carbonyl compounds, pericyclic reactions, and polymers (natural and synthetic). Introduction to carbon-13 NMR mass spectroscopy, and UV-visible spectroscopy. Lecture/laboratory.

CHM 250 Quantitative Analysis**4 hours***Prerequisite: CHM 132.*

Quantitative application of chemical equilibrium to the analysis of chemical systems. Specific topics include acid-base and oxidation-reduction titrations, separation techniques, colorimetric methods, and an introduction to electrochemical analysis. Lecture/laboratory.

CHM 322W Biochemistry**3 hours***Prerequisite: CHM 220. (Offered in alternate years)*

Topics include the structure, function, and organization of biomolecules; the pathways responsible for the production of biomolecules and metabolic energy; and the control of cellular functions. Lecture.

CHM 335W Thermodynamics**4 hours***Prerequisites: CHM 132 and one of PHY 220 or PHY 230.**(Offered in alternate years)*

Development of the principles of classical and statistical thermodynamics and their application to chemical systems. Includes a discussion of the kinetic theory of gases and equations of state and their significance in thermodynamics. Lecture/laboratory. (Cross-listed as PHY 335W.)

CHM 336 Quantum Chemistry and Kinetics**3 hours***Prerequisites: CHM 132 and one of PHY 220 or PHY 230.**(Offered in alternate years)*

Introduction to the principle of quantum mechanics as applied to chemical structure and reactivity. Includes a survey of spectroscopic techniques and a discussion of reaction dynamics. Lecture. Cross-listed as PHY 336.

CHM 350W Environmental Chemistry**3 hours***Prerequisite: CHM 250, BIO 142 (or BIO 130 with consent of instructor).**(Offered in alternate years)*

This course will focus on the chemistry of water, air, and soil, and the impact of this chemistry on living things. Human impacts such as air and water pollution, use of energy, and hazardous wastes will also be addressed. Political and social problems relating to human impact will be discussed. Lecture.

CHM 440 Inorganic Chemistry

3 hours

Prerequisite: CHM 336. (Offered in alternate years)

Survey of the bonding, properties, and reactions of inorganic substances. Specific topics include the application of group theory to the modern theory of molecular structure and a critical evaluation of acid/base theories. Lecture.