The Chemistry Department offers graduate-level course work but no graduate degree programs.

Graduate Faculty
Scott Bailey-Hartsel, Ph.D.
Sudeep Bhattacharyya, Ph.D.
Michael J. Carney, Ph.D.
Patricia Cleary, Ph.D.
Bart J. Dahl, Ph.D.
Jennifer Dahl, Ph.D.
Stephen Drucker, Ph.D.
Warren Gallagher, Ph.D. (Chair)
Jason A. Halfen, Ph.D.
Sanchita Hati, Ph.D.
Frederick W. King, Ph.D.
David E. Lewis, Ph.D.
Cheryl L. Muller, Ph.D.
James A. Phillips, Ph.D.
Roslyn Theisen, Ph.D.
Kurt Wiegel, Ph.D.
Thao Yang, Ph.D.

No graduate degree programs offered.

Courses in chemistry are taken as part of graduate programs in other areas.

All 500- and 600-level graduate courses include requirements or assignments which differentiate them from their companionate 300- and 400-level undergraduate offerings. Students who have taken a course at the 300- or 400-level may not include that course at the 500- or 600-level in a graduate program, except in the case of special topics courses when the topic is not the same as that taken at the undergraduate level.

CHEM 601 Inorganic Chemistry (3 crs)
Prerequisite: CHEM 218 and CHEM 326.
• Cross-listed with CHEM 401. Credit may not be earned in both courses.
Structure, bonding, and reactivity of inorganic compounds. Symmetry and group theory, vibrational analysis, and molecular orbital theory. Arrhenius and Lewis acid/base concepts. Organometallic and bioinorganic compounds, reactions, and mechanisms.
Grading Basis: No S/U Grade Option
Lecture/Discussion Hours: 3
Lab/Studio Hours: 0

CHEM 611 Survey of Industrial Chemistry (3 crs)
Prerequisite: CHEM 218 and CHEM 326.
• Cross-listed with CHEM 411. Credit may not be earned in both courses.
Survey of manufacturing processes, applications, and economics of major inorganic and organic chemicals and polymers, including those involved in the production of plastics, fibers, elastomers, pesticides, pharmaceuticals, detergents, electronics, and pollution control technologies.
Attributes: Field Trip(s) Required
Grading Basis: No S/U Grade Option
Lecture/Discussion Hours: 3
Lab/Studio Hours: 0

CHEM 626 Modern Organic Chemistry (3 crs)
Prerequisite: CHEM 326
• Cross-listed with CHEM 426. Credit may not be earned in both courses.
Selected advanced topics in organic chemistry, including reaction mechanisms and synthesis, with emphasis on recent developments in the field.
Grading Basis: No S/U Grade Option
Lecture/Discussion Hours: 3
Lab/Studio Hours: 0

CHEM 633 Physical Chemistry I (4 crs)
Prerequisite: CHEM 213, CHEM 218; MATH 215; PHYS 232 or concurrent enrollment.
• Cross-listed with CHEM 433. Credit may not be earned in both courses.
A quantitative study of the physical properties of matter emphasizing the macroscopic perspective. Topics include: gas behavior, chemical thermodynamics, phase equilibrium, mixtures and solutions, chemical equilibrium, electrochemistry, and chemical kinetics.
Grading Basis: No S/U Grade Option
Lecture/Discussion Hours: 4
Lab/Studio Hours: 0

CHEM 634 Physical Chemistry II (4 crs)
Prerequisite: CHEM 433/CHEM 633
• Cross-listed with CHEM 434. Credit may not be earned in both courses.
Continuation of Chemistry 433/633. The quantitative study of the physical properties of matter emphasizing the microscopic perspective. Topics include: quantum theory, atomic and molecular structure, chemical bonding, molecular symmetry, spectroscopy, resonance techniques, and statistical mechanics.
Grading Basis: No S/U Grade Option
Lecture/Discussion Hours: 4
Lab/Studio Hours: 0
CHEM 638 Physical Analysis Laboratory (2 crs)
Prerequisite: CHEM 434/CHEM 634 or concurrent registration.
• Cross-listed with CHEM 438. Credit may not be earned in both courses.

An advanced, project-oriented laboratory course in physical and analytical chemistry. Beyond reinforcing the fundamental concepts in these sub-fields, particular emphasis will be placed on technical writing, and the development of hands-on laboratory skills.

Attributes: Special Course Fee Required
Grading Basis: No S/U Grade Option
Lecture/Discussion Hours: 0
Lab/Studio Hours: 6

CHEM 652 Biochemistry I (3 crs)
Prerequisite: CHEM 326 or CHEM 323. Credit may not be earned in both CHEM 352 and CHEM 452/ CHEM 652.
• Cross-listed with CHEM 452. Credit may not be earned in both courses.

Chemistry of important constituents of living matter. Topics include proteins, carbohydrates, lipids, and nucleic acids. Also included are bioenergetics and basic enzyme kinetics and mechanism.

Grading Basis: No S/U Grade Option
Lecture/Discussion Hours: 3
Lab/Studio Hours: 0

CHEM 653 Biochemistry Laboratory (2 crs)
Prerequisite: CHEM 213; CHEM 452/CHEM 652 or concurrent registration.
Consent: Instructor Consent Required
• Cross-listed with CHEM 453. Credit may not be earned in both courses.

Study of experimental methods of analysis in biochemistry and their use in determination of structure and function.

Attributes: Special Course Fee Required
Grading Basis: No S/U Grade Option
Lecture/Discussion Hours: 0
Lab/Studio Hours: 6

CHEM 654 Biochemistry II (3 crs)
Prerequisite: CHEM 452/CHEM 652
• Cross-listed with CHEM 454. Credit may not be earned in both courses.

Study of advanced concepts in biochemistry, especially those involving metabolism and their regulatory mechanism of action.

Grading Basis: No S/U Grade Option
Lecture/Discussion Hours: 3
Lab/Studio Hours: 0

CHEM 660 Polymer Chemistry (3 crs)
Prerequisite: Grade of C or above in CHEM 326.
• Cross-listed with CHEM 460. Credit may not be earned in both courses.

An introduction to synthetic and naturally occurring polymers with a focus on synthesis, analysis, and structure/property relationships. The history and development of polymers will be discussed as well as the impact on industry and society.

Grading Basis: No S/U Grade Option
Lecture/Discussion Hours: 3
Lab/Studio Hours: 0

CHEM 796 Directed Studies (1-3 crs)
Summer workshop for teachers.
Repeat: Course may be repeated for a maximum of 6 credits
Grading Basis: No S/U Grade Option

CHEM 797 Independent Study (1-3 crs)
Consent: Department Consent Required
Individual project under the direction of a faculty member.
Repeat: Course may be repeated
Grading Basis: No S/U Grade Option