# CHEMISTRY (CHM)

**CHM 500 - Chemical Topics (1.0-3.0 hours)**
Topic stated in the current Schedule of Classes. Maximum of 3 credit hours per semester; may be repeated under different topics for a maximum of six credit hours. Cross-listed with CHM 400.
Prerequisite: C or better in CHM 256.

**CHM 512 - Molecular Modeling (1.0 hour)**
An introduction to computational chemistry with an emphasis on the structures and energies of organic systems. Cross listed with CHM 412. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: C or better in CHM 256.

**CHM 514 - Chemical Group Theory (1.0 hour)**
Application of symmetry and group theory to chemical systems. Topics include point groups, character tables, spectroscopic selection rules, and molecular orbital theory. Cross listed with CHM 414. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: C or better in CHM 256.

**CHM 516 - Environmental Chemistry (3.0 hours)**
Chemical principles applied to environmental topics such as air, water, soils, and conventional and hazardous wastes. Thermodynamic and kinetic principles, acid-base and redox chemistry, interfacial chemistry and analytical techniques are included. Cross-listed with CHM 416. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: C or better in CHM 112 or CHM 116.

**CHM 520 - Instrumental Analysis (4.0 hours)**
Theory and applications of qualitative and quantitative instrumental methods of chemical analysis. Includes laboratory. Cross listed with CHM 420. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: C or better in CHM 257 and CHM 320 and CHM 321.

**CHM 522 - Clinical Chemistry (2.0 hours)**
Diagnostic laboratory testing methods in a variety of areas, including endocrinology, enzymes, acid-base balance, carbohydrates, and lipids. Not open to students with credit in CHM 422.
Prerequisite: CHM 162

**CHM 524 - Fundamentals of Separation Science (3.0 hours)**
The theory and practice of separation methods used in the analytical chemistry of chemical and biochemical systems are covered. Traditional separation methods such as extraction, precipitation, and crystallization are introduced. These techniques are compared and contrasted with chromatographic methods of separation that make up the bulk of the topics covered. Chromatographic theory and its practical application in the form of specific analytical separation methods are discussed.
Prerequisite: CHM 320 or CHM 420 or CHM 470

**CHM 526 - Advanced Analytical Chemistry (3.0 hours)**
Instrumental analysis, including topics in spectroscopy, electrochemistry, chromatography, sampling, and statistics.
Prerequisite: C or better in CHM 420 or CHM 520.

**CHM 536 - Inorganic Chemistry (3.0 hours)**
Theoretical and descriptive inorganic chemistry, including atomic structure, molecular structure, coordination chemistry, organometallic chemistry, and catalysis. Cross listed with CHM 436. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: C or better in CHM 114 or concurrent enrollment; C or better in CHM 256.

**CHM 540 - Materials Chemistry (3.0 hours)**
Study of unit cells, band theory, and the structure, function, and characterization (diffraction, microscopy, and spectroscopy) of metals, polymers, glasses, concrete, ceramics, and biomaterials. Cross listed with CHM 440. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: C or better in CHM 256 and CHM 257 or consent of instructor.

**CHM 541 - Materials Chemistry Laboratory (1.0 hour)**
Laboratory that reinforces and expands upon concepts covered in CHM 440/540. Emphasis on methods of fabrication and characterization of various types of materials. Cross listed with CHM 441. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: C or better in CHM 440 or CHM 540 or concurrent enrollment.

**CHM 552 - Advanced Organic Chemistry (3.0 hours)**
Topics include principles of physical organic chemistry, organometallic chemistry, and stereo- and regiochemical control in organic synthesis.
Prerequisite: CHM 256 and CHM 257.

**CHM 558 - Topics in Organic Chemistry (1.0-6.0 hours)**
Topic stated in the current Schedule of Classes. Maximum of 3 hours per semester; may be repeated under different topics for a maximum of six credits.
Prerequisite: Consent of instructor.

**CHM 560 - Principles of Biochemistry (3.0 hours)**
Survey of the structural and functional properties of the major classes of biological macromolecules (proteins, nucleic acids, carbohydrates and lipids) and their roles in biological systems. Topics include enzyme kinetics and mechanisms, selected metabolic pathways, and the role of nucleic acids in the flow of genetic information.
Prerequisite: Graduate standing and consent of instructor.

**CHM 561 - Principles of Biochemistry Laboratory (1.0 hour)**
Techniques and methods of macromolecular purification and characterization; refining skills of record collecting, data analysis, and presentation of results in manuscript form.
Prerequisite: C or better in CHM 360 or CHM 560

**CHM 562 - Protein Structure and Function (3.0 hours)**
Investigation of the structure-function relationships of proteins, with emphasis on thermodynamics and kinetics. Topics include ligand binding, enzymatic catalysis, and the use of molecular visualization software. Cross listed with CHM 462. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: C or better in CHM 360 or equivalent.

**CHM 564 - Biochemical Literature (1.0-2.0 hours)**
Designed to foster students' ability to read and critically evaluate biochemistry papers from the primary literature. In addition, students will gain experience in giving oral presentations and writing critical summaries of the papers they present.
Prerequisite: C or better in CHM 360 and consent of instructor.

**CHM 566 - Intermediary Metabolism (3.0 hours)**
Study of the processes by which carbohydrates, lipids, proteins, and nucleic acids are synthesized, stored, or oxidized to generate biochemical energy and building blocks. Regulation of these processes will be examined. Cross listed with CHM 466. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: C or better in CHM 360 or equivalent.

**CHM 568 - Selected Topics in Biochemistry (1.0-3.0 hours)**
Topic stated in the current Schedule of Classes. Maximum of 3 hours per semester; may be repeated under different topics for a maximum of six credits.
Prerequisite: consent of instructor.

**CHM 570 - Physical Chemistry I (3.0 hours)**
Topics include kinetic molecular theory, thermodynamics, equilibrium, and kinetics. Students conduct independent projects. Cross listed with CHM 470. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: Grade of C or better in: CHM 116 and CHM 256; MTH 116 or MTH 122; PHY 108 or PHY 201

**CHM 571 - Physical Chemistry Laboratory (1.0 hour)**
Experimental and computational studies of the physical properties of matter. Cross listed with CHM 471. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: C or better in CHM 470 or concurrent enrollment in CHM 570.

**CHM 576 - Physical Chemistry II (3.0 hours)**
Topics include quantum mechanics, spectroscopy, and statistical thermodynamics. Students conduct independent projects. Cross listed with CHM 476. For cross-listed undergraduate/graduate courses, the graduate-level course will have additional academic requirements beyond those of the undergraduate course.
Prerequisite: Grade of C or better in: CHM 116 and CHM 256; MTH 116 or MTH 122; PHY 108 or PHY 201

**CHM 580 - Literature Seminar in Chemistry & Biochemistry (1.0 hour)**
Each student presents a literature-based seminar under the supervision of a faculty member.
Prerequisite: consent of instructor.

**CHM 584 - Readings in Chemistry and Biochemistry (1.0-6.0 hours)**
Directed reading for qualified students. Maximum of 3 hours per semester; repeatable for up to 6 hrs credit.
Prerequisite: consent of instructor.

**CHM 599 - Research (0.0-8.0 hours)**
Core Curriculum: EL
Research in an area of interest to the student, repeatable for up to 8 hours credit. At the completion of the semester, students are required to submit a research report, describing the goals, methods, and results of the study. Zero-credit course graded. Satisfactory/Unsatisfactory.

**CHM 686 - Literature Review (1.0 hour)**
Each student will prepare a concise, up-to-date, well-written review paper and present a seminar to the Department on a literature topic that is chosen in consultation with the course instructor and the student's academic advisor.
Prerequisite: Consent of instructor

**CHM 697 - Research (0.0-10.0 hours)**
Research in an area of chemistry or biochemistry of interest to the student, repeatable for up to 10 hours credit. At the completion of the semester, students are required to submit a research report, giving an update of the progress made in their research. Zero credit course graded Satisfactory/Unsatisfactory.
Prerequisite: Consent of instructor

**CHM 699 - Thesis (0.0-1.0 hours)**
All MS students must write a thesis based on independent research and present a public seminar detailing the accomplishments of his/her thesis research. The final version of thesis must conform to the requirements outlined by the department and on the Graduate School website. Typically, students enroll in the course in the semester they intend to submit their thesis. Zero credit course graded Satisfactory/Unsatisfactory.
Prerequisite: 6 hours of CHM 697 with grades of B or better.