# CHEMISTRY (CHEM)

**CHEM 413 - ADVANCED ORGANIC CHEMISTRY**
Spectrometric methods for determining the structures of organic compounds. Mass spectrometry, proton and carbon FT-NMR, infrared, ultraviolet, and visible spectroscopy. Laboratory includes synthesis of organic compounds and applied spectroscopic methods.
Credits: 2,3
Attributes: Lab Course
Course Notes: Lecture and Lab course., Should have the equivalent of CHEM 202 with a min, of C- and CHEM 212 with a min grade of C-.

**CHEM 421 - PHYSICAL CHEMISTRY- THERMODYNAMICS**
First, second, third law of thermodynamics, chemical equilibrium, phase equilibrium and kinetic theory of gases.
Credits: 2,3
Attributes: Lab Course
Course Notes: Should have equivalent of CHEM 202 with a min, grade of C- and CHEM 212 with a min grade of C-, and Math 232 with a min grade of C- and PHYS, 202 and PHYS 234 with a min grade of C-.

**CHEM 437 - INSTRUMENTAL ANALYSIS**
Basic theories and experimental techniques in instrumental methods of analysis including spectrophotometry, chromatography, and electrochemistry.
Credits: 2,3
Attributes: Lab Course
Course Notes: Lecture and Lab course., Must have equivalent of CHEM 202 with a min grade of C-, and CHEM 212 with a min grade of C- and CHEM 237 with a, min grade of C-.

**CHEM 441 - INORGANIC CHEMISTRY**
Survey of theoretical and synthetic inorganic chemistry. Atomic theory, bonding theory, crystal structure, chemical periodicity, coordination compounds, acid-base systems, and molecular symmetry.
Credits: 3
Course Notes: CHEM 202 with a min grade of C- and CHEM 212 with a min, grade of C and CHEM 237 with a min grade of C-

**CHEM 444 - BIOINORGANIC CHEMISTRY**
Survey of biological molecules that involve metal ions and/or metal-containing cofactors; the interaction and biological significance of metal ions including medicinal applications.
Credits: 3
Course Notes: CHEM 212 with a min grade of C-; BIOL 301 recommended.

**CHEM 452 - MEDICINAL CHEMISTRY**
Chemistry and pharmacology of the principal classes of drugs; history of the development of medicinal chemistry; mechanisms of drug action; relationships between molecular structure and biological activity; the literature of medicinal chemistry; evaluation of potential drugs; perspective on the design of new drugs.
Credits: 3
Course Notes: Graduate standing

**CHEM 485 - THESIS**
Independent laboratory research culminating in a written thesis under supervision of a faculty sponsor and thesis committee.
Credits: 1-6

**CHEM 492 - RESEARCH IN CHEMISTRY**
Independent field- or laboratory-based research experience under the supervision of a faculty sponsor. A minimum of 3 completed semester hours will fulfill the research requirement for the MS degree. Up to 3 semester hours may be applied toward thesis requirements. Students may register in consecutive semesters.
Credits: 1-4
Course Notes: Consent of instructor. $100 per semester hour., Students must arrange for independent laboratory, research experience with a science, faculty member prior to registration.

**CHEM 495 - INDEPENDENT STUDY**
Credits: 1-6
Course Notes: Consent of instructor