

# CHEMISTRY (CHEM)

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**CHEM-100 INTRODUCTION TO CHEM. (3 Credits)**

An introduction to the discipline of chemistry and an inventory of the basic materials of chemistry that a student must master prior to Chemistry 101. The course presents a modern view of chemistry suitable for pupils with a wide range of skills and abilities.

**CHEM-101 GENERAL CHEMISTRY I (3 Credits)**

Three hours of lecture per week. This course covers the atomic theory of matter, stoichiometry, gases, thermochemistry, atomic and molecular structures, condensed phases and solutions.

**Corequisite(s):** Take CHML-101

**CHEM-102 GENERAL CHEMISTRY II (3 Credits)**

Three hours of lecture per week. A continuation of Chemistry 101. Topics covered include chemical kinetics, acid-base chemistry, gas-phase and solution equilibria, oxidation-reduction reactions, electrochemistry, and some descriptive chemistry.

**Prerequisite(s):** Take CHEM-101

**CHEM-201 ANALYTICAL CHEMISTRY (3 Credits)**

Three hours of lecture a week. A study of the theory and techniques of quantitative analysis, including gravimetric, volumetric, potentiometric, spectrophotometric and chromatographic methods.

**Prerequisite(s):** Take CHEM-102

**CHEM-301 ORGANIC CHEMISTRY I (3 Credits)**

Three hours of lecture a week. This class integrates modern and classical theories of organic chemistry. Topics include structural formulas, equilibrium and rate concepts, stereochemistry, and reaction mechanisms of alkanes, alkenes, haloalkanes, alcohols, and phenols.

**Prerequisite(s):** Take CHEM-102

**CHEM-302 ORGANIC CHEMISTRY II (3 Credits)**

Three hours of lecture a week. A continuation of Chemistry 301. The structure, properties and reaction mechanisms of aldehydes and ketones, carboxylic acids and their derivatives, amines, and aromatic compounds are discussed. A thorough introduction to structural analysis by NMR and IR spectroscopy is included.

**Prerequisite(s):** Take CHEM-301

**CHEM-401 PHYSICAL CHEMISTRY I (3 Credits)**

Three hours of lecture a week. A systematic application of physical and mathematical principles to chemical systems. Topics addressed include classical thermodynamics, equilibrium systems, and chemical kinetics.

**Prerequisite(s):** Take CHEM-102 PHYS-104 MATH-152

**CHEM-402 PHYSICAL CHEMISTRY II (3 Credits)**

Three hours of lecture a week. Topics addressed include quantum theory, atomic and molecular structure, chemical bonding and spectra, and an introduction to statistical mechanics and chemical dynamics.

**Prerequisite(s):** Take CHEM-401

**CHEM-427 SEMINAR IN CHEMISTRY (0 Credits)**

One hour a week. A lecture-discussion program devoted to current advances in chemistry and their relations to fundamental chemical principles.

**Restrictions:** RG.86+

**CHEM-431 INSTRUMENTAL ANALYSIS (3 Credits)**

Three hours of lecture a week. A study of the theory and techniques of instrumental analysis, such as, potentiometry, polarography, spectroscopy, chromatography, mass spectrometry, NMR, and other advanced instrumental techniques.

**Corequisite(s):** CHEM-302 and CHML-302

**CHEM-441 ADVANCED INORGANIC CHEMISTRY (3 Credits)**

Three hours of lecture a week. A study of the basic models and concepts fundamental to inorganic chemistry and an introduction to the bonding, reaction mechanisms and spectroscopic properties of transition metal complexes.

**Corequisite(s):** CHEM-302 and CHML-302 and CHEM 401

**CHEM-451 ADVANCED PHYSICAL CHEMISTRY (3 Credits)**

Three hours of lecture a week. This course will focus on current topics in physical chemistry.

**Prerequisite(s):** Take CHEM-401

**CHEM-470 MECHANISMS IN BIOLOGICAL SYSTEM (3 Credits)**

Three hours of lecture a week. The well-established mechanistic principles of organic chemistry will be applied to chemical reactions occurring in vivo. Topics include the mechanisms for the metabolism of carbohydrates, fats, and amino acids.

**Prerequisite(s):** Take CHEM-302

**CHEM-480 SP.TOPICS IN CHEMISTRY (2-3 Credits)**

An upper level/seminar on a specific topic of special interest to a member of the department's faculty. The specific topic and instructor will be announced prior to registration for the semester in which it is offered.

**CHEM-480A SP TOP. SPECTROSCOPY OF ORGANIC STRUCTURES & UNKNOWNNS (3 Credits)**

An upper level/seminar on a specific topic of special interest to a member of the department's faculty. The specific topic and instructor will be announced prior to registration for the semester in which it is offered.

**CHEM-497 WORK EXPERIENCE (3-6 Credits)**

This course is designed to develop off-campus opportunities for students interested in broadening their undergraduate experience to include periods of paid employment, community service, travel or even independent study. All of the course requirements are handled by the student, the advisor, and the department chair.

**CHEM-498 UNDERGRADUATE RESEARCH (1-3 Credits)**

Original research is performed under the supervision of a faculty member; both library and laboratory work are expected. Prerequisite: at least sophomore standing and consent of the faculty member involved.

**Restrictions:** RG.24+

**CHEM-499 UNDERGRADUATE RESEARCH (1-3 Credits)**

A continuation of Chemistry 498. A comprehensive written research report is required.

**Restrictions:** RG.24+