Chemistry

Thomas P. West (Department Head)
Location: Science Building, 903-886-5392
Chemistry Web Site (http://www.tamuc.edu/academics/colleges/scienceEngineeringAgriculture/departments/chemistry/default.aspx)

The Department of Chemistry (http://www.tamuc.edu/academics/colleges/scienceEngineeringAgriculture/departments/chemistry/default.aspx) provides a broad range of subjects, courses and opportunity for independent research at the master's level. Programs are designed to provide suitable preparation for PhD programs, community college & public school teaching, governmental and industrial employment, and for research.

Chemistry laboratories are equipped for research in physical, organic, inorganic, biological, and analytical chemistry. Modern chemical instrumentation includes NMR, infrared, visible, ultraviolet, atomic absorption, and time-of-flight & ion mobility mass spectrometers; gas and liquid chromatographs; high temperature and/or pressure reactors; an ultracentrifuge; a cold room; and standard laboratory instruments.

Program of Graduate Work

Master of Science in Chemistry

The Department of Chemistry offers a thesis and non-thesis Master of Science degree including professional tracks in Chemical Education and Chemical Business.

Admission

Admission to a graduate program is granted by the Dean of the Graduate School upon the recommendation of the department. Applicants must meet the following requirements for admission in addition to meeting the general university requirements in Chemistry.

- Admission Requirements (https://www.tamuc.edu/programs/chemistry-ms/#Admission)

Successful completion of the Comprehensive Exam is required of all students.

Note: Individual departments may reserve the right to dismiss from their programs students who, in their judgment, would not meet the professional expectations of the field for which they are training.

Chemistry MS (https://coursecatalog.tamuc.edu/grad/colleges-and-departments/science-engineering/chemistry/chemistry-ms/)

CHEM 501 - Graduate Seminar
Hours: 1
Graduate Seminar. One semester hour. Students' presentations of research articles from recent chemical journals and guest speakers' lectures on their research, with discussion. Students meet with guest speakers to learn about employment and other professional opportunities. Crosslisted with: CHEM 401.

CHEM 502 - Safety in the Chemical Laboratory
Hours: 1-3
An introduction to the safety problems encountered in the operation of the chemical laboratory. Topics include types of hazardous materials, proper storage procedures, causes of accidents, identification and minimization of laboratory hazards, proper utilization of safety devices, emergency procedures and review of safety codes.

CHEM 513 - Organic Mechanisms & Structure
Hours: 3
A study of the fundamental mechanisms of organic reactions with emphasis on the effects of structural and stereochemical changes on the course of reactions. Prerequisites: Consent of instructor.

CHEM 514 - Biochemistry
Hours: 3
This is a one-semester graduate-level course in biochemistry that will develop mastery in the nomenclature and function of the major classes of molecules associated with living organisms. The subject matter is appropriate to prepare students for doctoral programs in chemistry or biochemistry. Prerequisites: Consent of instructor.

CHEM 515 - Synthetic Organic Transformations
Hours: 3
Synthetic Organic Transformations. Three semester hours. Chemical and biochemical methods for transforming and synthesizing organic chemical compounds, including bioactive agents and pharmaceuticals. As the subject changes, the course may be taken twice, with department head and instructor's approval. Prerequisites: consent of the instructor.

CHEM 517 - Applied Biochemistry & Biotechnology
Hours: 3
This is a one-semester course that serves as an introduction to the use of biochemistry principles in biotechnology. The course topics will be presented along with examples where it will be demonstrated how the field of biochemistry is critical to a variety of biotechnological applications including the synthesis of biologically important products. Prerequisites: Consent of instructor.

CHEM 518 - Thesis
Hours: 1-6
Thesis. Three to six semester hours. Graded on a (S) satisfactory or (U) unsatisfactory basis.

CHEM 521 - Chemical Thermodynamics
Hours: 3
An advanced study of the theories and applications of classical thermodynamic functions.

CHEM 521A - Chemical Thermodynamics
Hours: 3
(Same as CHEM 521) An advanced study of the theories and applications of classical thermodynamic functions. Crosslisted with: CHEM 521.

CHEM 522 - Quantum Chemistry
Hours: 3
Quantum Chemistry. Three semester hours. A study of the mathematical aspects of quantum mechanics including blackbody radiation, fundamental postulates, rotation, vibration, hydrogen atom, variational calculation, pertubational calculation, electron spin, chemical bonding, and spectroscopy.

CHEM 523 - Mathematical Methods in Chemistry
Hours: 3
Mathematical Methods in Chemistry. Three semester hours. Mathematical methods and their utility in the various fields of chemistry will be covered. As the subject matter changes, the course may be repeated up to two times with department head approval. Prerequisites: Consent of the department head.

CHEM 527 - Chemical and Biochemical Characterization Methods I
Hours: 3
Chemical and Biochemical Characterization Methods I. Three semester hours. Methods for purifying, identifying and characterizing chemical and biochemical compounds. Use of spectroscopic, diffraction, and chromatographic methods, especially those utilized in research. As the subject changes, the course may be repeated for credit.

CHEM 528 - Chemical and Biochemical Characterization Methods II
Hours: 3
The course focuses on the instrumentation methods covered by CHEM 527. It includes the method development of the software and detailed understanding of the hardware components and their modifications to meet various application needs.

CHEM 529 - Workshop in Chemistry
Hours: 3-6
For current and future teachers of chemistry and other sciences. Depending on the subject and students' needs, this course consists of lectures or lectures and laboratory. As the subject changes, the course may be taken repeatedly, but the maximum total credit is six semester hours. Prerequisites: department head's consent.

CHEM 531 - Advanced Inorganic Chem
Hours: 3
A study of the application of modern concepts of bonding and energetics to problems of the structure and reactions of inorganic compounds.

CHEM 531A - Advanced Inorganic Chem
Hours: 3
(Same as CHEM 531) A study of the application of modern concepts of bonding and energetics to problems of the structure and reactions of inorganic compounds. Crosslisted with: CHEM 531.

CHEM 533 - Kinetics and Mechanism
Hours: 3
Chemical Kinetics and Mechanism. Three semester hours. Principles and methods of chemical kinetics and study of reaction mechanisms in organic, inorganic, and biological chemistry. As the subject changes, the course may be taken twice, with department head's permission.

CHEM 536 - Organometallic Chemistry
Hours: 3
Organometallic Chemistry. Three semester hours. Synthesis, structure, reactivity, and other properties of compounds containing metal-carbon bonds. Application of organometallics in synthesis, catalysis, and industrial processes. As the subject changes, the course may be taken twice, with department head's approval.

CHEM 541 - Advanced Analytical Chemistry
Hours: 3
Theoretical principles of analytical chemistry and their applications.

CHEM 547 - Advanced Instrumental Analysis I
Hours: 3
Principles and techniques of analytical chemistry will be covered. As the subject matter changes, the course may be repeated up to two times with department head approval.

CHEM 548 - Advanced Instrumental Analysis II
Hours: 3
Advanced Instrumental Analysis II. Three semester hours. The course extends the coverage of instruments not covered by CHEM 547. It includes methods of development of the software and detailed understanding of the hardware components and their modifications to meet various application needs.

CHEM 550 - Advanced Methods in Chemical Research and Experimental Design
Hours: 3
This course is designed to improve the ability of graduate students to understand what is involved in doing chemical research such as performing a review of the literature, comprehending hypothesis development, and employing research methodology to devise an effective experimental design.

CHEM 589 - Independent Studies
Hours: 1-4
Independent Studies. Assigned reading or assigned original research project, which the student does under the guidance of a faculty member. Students in option I may take this course in addition to CHEM 518. Students in option II may take this course to improve their qualifications and career prospects. May be repeated once, for work on the same project. Prerequisites: More than two complete semesters of graduate study, instructor's approval, and department head's consent.

CHEM 595 - Research Lit & Techniques
Hours: 3
Research Literature and Techniques. Three semester hours. Option-II students learn about current research by studying assigned articles in primary literature and preparing a scholarly review of primary literature or doing a smaller research project. Option-I students take CHEM 518 instead. Prerequisites: more than two semesters of graduate study, approval by the students advising professor, and consent of the department head.

CHEM 597 - Special Topics
Hours: 1-4