

CHEMISTRY**PROFESSOR**

David Y. Jeter. 1973. B.S., Texas A&M University-Commerce; Ph.D., University of North Carolina, Chapel Hill. (Inorganic chemistry.)

ASSOCIATE PROFESSORS

Darlene M. Loprete. James H. Daughdrill, Jr. Professor of the Natural Sciences. 1990. B.A., Clark University; Ph.D., University of Rhode Island. (Biochemistry.)

Jon Russ. 2004. Chair. A.A., Del Mar College; B.S., Corpus Christi State University; Ph.D., Texas A&M University. (Analytical chemistry.)

ASSISTANT PROFESSORS

Mauricio L. Cafiero. 2004. B.S., University of North Florida; M.A. and Ph.D., University of Arizona. (Physical chemistry.)

Loretta Jackson-Hayes. 2003. B.S., Tougaloo College; Ph.D., University of Tennessee. (Pharmacology.)

Julie C. D. Le. 2005. B.S. and M.S., Louisiana State University; Ph.D., The University of Texas, Austin. (Organic Chemistry.)

CHEMISTRY STOREROOM AND LABORATORY MANAGER

Jeff R. Goode. B.S., University of Memphis.

STAFF

Evelena B. Grant. Departmental Assistant. A.D., Compton College.

Students considering a major in Chemistry should consult a member of the Department as early as possible to help in the election of a program which best fits their interests and abilities. The Department is certified by the American Chemical Society as complying with its requirements for the professional training of chemists.

REQUIREMENTS FOR A MAJOR IN CHEMISTRY LEADING TO THE B.A. DEGREE

A total of forty-nine to fifty-one (49-51) credits as follows:

1. Chemistry 111-111L, 112-112L (or 122-122L), 211-212, 211L-212L, 311, 311L, and three additional approved one-semester courses.
2. Physics 111-112 or 109-110, 113L-114L.
3. Mathematics 121-122.
4. Chemistry 385-386.
5. Chemistry 485-486.

REQUIREMENTS FOR A MAJOR IN CHEMISTRY LEADING TO THE B.S. DEGREE**A. Chemistry Track**

A total of fifty-two to fifty-three (52-53) credits as follows:

1. Chemistry 111-111L, 112-112L (or 122-122L), 211-212, 211L-212L, 311-312, 312L, 406, 408, and one additional approved one-semester course.
2. Physics 111-112 or 109-110, 113L-114L.
3. Mathematics 121-122. (A third course is required by the College for the B.S. degree.)
4. Chemistry 385-386.
5. Chemistry 485-486.

B. Biochemistry Track

A total of sixty-three to sixty-four (63-64) credits as follows:

1. Chemistry 111-111L, 112-112L (or 122-122L), 211-212, 211L-212L, 310, 311-312, 312L, 414-415.
2. Biology 120-121, 121L, 307 and one of the following: 301, 330, 340 or 370.
3. Physics 111-112 or 109-110, 113L-114L.
4. Mathematics 121-122. (A third course is required by the College for the B.S. degree.)
5. Chemistry 385-386.
6. Chemistry 485-486.

REQUIREMENTS FOR CERTIFICATION BY THE AMERICAN CHEMICAL SOCIETY

1. Chemistry 111-111L, 112-112L (or 122-122L), 211-212, 211L-212L, 311-312, 312L, 406, 408, 414 and one of the following: Chemistry 415, 422, 432, 451, 452, or an approved advanced course in molecular biology, physics or mathematics.
2. Physics 111-112 or 109-110, 113L-114L.
3. Mathematics 121-122. (A third course is required by the College for the B.S. degree.)
4. Chemistry 385-386.
5. Chemistry 485-486.

HONORS IN CHEMISTRY

1. Courses required: those listed for the B.S. degree as well as Chemistry 451 and 452.
2. An original investigation of some problem in chemistry or biochemistry, usually related to research being carried on by a member of the department, is required. A creditable thesis must be presented at the end of the project. The honors project and its outcome must be approved by the Individualized Studies Committee.
3. A public presentation on the honors work is required by the department.

COURSE OFFERINGS

NOTE: The laboratory periods referred to in the following courses indicate an afternoon period of at least three hours.

105. Topics in Chemistry.

Fall, Spring. Credits: 3.

Degree Requirements: Natural Science.

Chemical principles and information will be studied through the examination of thematic topics in the chemical sciences. Open only to non-science majors.

111. General Chemistry I.

Fall. Credits: 3.

Degree Requirements: Natural Science.

A study of the basic concepts and principles of chemistry with a particular emphasis on inorganic chemistry. Topics to be considered include stoichiometry, atomic and molecular structure, bonding, descriptive chemistry, and coordination chemistry. Prerequisite: One year of high school chemistry or consent of instructor.

Corequisite: Chemistry 111L.

111L. General Chemistry Laboratory I.

Fall. Credits: 1.

An experimental introduction to the physical and chemical properties of matter. One laboratory period a week.

Corequisite: Chemistry 111**112. General Chemistry II.**

Spring. Credits: 3.

Degree Requirements: Natural Science.

A continuation of Chemistry 111. Topics to be covered include states of matter, solutions, elementary kinetics and equilibria, acids and bases, oxidation-reduction and electrochemistry, and thermochemistry.

Prerequisites: Chemistry 111-111L.**Corequisite:** Chemistry 112L.**112L. General Chemistry Laboratory II.**

Spring. Credits: 1.

An experimental introduction to the volumetric techniques of chemical analysis. One laboratory period a week.

Prerequisites: Chemistry 111L.**Corequisite:** Chemistry 112.**122. Chemical Separations and Measurements.**

Spring. Credits: 3.

Degree Requirements: Natural Science.

A continuation of Chemistry 111 for students planning to major in the chemistry or biochemistry tracks. A detailed study of chemical equilibria with special attention given to ionic systems and acid-base reactions. An introduction to the basic principles and practice of absorption spectrophotometry and electrochemistry. A unified treatment of all types of chromatography.

Prerequisites: Chemistry 111-111L.**Corequisite:** Chemistry 122L.**122L. Chemical Separations and Measurements Laboratory.**

Spring. Credits: 2.

Practical laboratory experiments which provide the foundation for the material covered in Chemistry 122. Two laboratory periods per week.

Corequisite: Chemistry 122.**180. The Art and Science of Early Italian Painting.**

Spring. Credits: 3.

An interdisciplinary course in which students study the art and science of early Italian painting. Students will produce their own panel painting using original techniques and analyze the scientific principals involved in creating such works. Students will also investigate the cultural, historical, and stylistic context in which Italian art was produced ca. 1250-1500. Two lectures and one lab per week. (Course offered in alternate years; scheduled for 2005-2006.)

Prerequisites: One year of high school chemistry or the equivalent.**211-212. Introductory Organic Chemistry.**

Fall, Spring. Credits: 3-3.

Degree Requirements: Natural Science.

A general survey of elementary theory, preparation, reactions, and properties

of the compounds of carbon, both aliphatic and aromatic, containing the most important functional groups.

Prerequisites: Chemistry 112-112L or 122-122L

Corequisite: Chemistry 211L-212L.

211L-212L. Organic Chemistry Laboratory.

Fall, Spring. Credits: 1-1.

Emphasis is placed upon synthesis and the common laboratory techniques encountered in organic chemistry. One laboratory period a week.

Corequisite: Chemistry 211-212.

310. Methods in Biochemistry and Cell Biology.

Fall. Credits: 2.

This course will provide instruction in the theory and application of a variety of research techniques dealing with the structure and function of proteins in biological systems. Techniques to be studied include enzyme assays and characterization, peptide sequencing, polyacrylamide gel electrophoresis, antibody production, immunoblotting, and immunofluorescence microscopy. This course can count as laboratory credit to accompany Biology 307 or Chemistry 414 or both. One hour of lecture and three hours of laboratory per week plus independent work. Same as Biology 310.

Prerequisites: Chemistry 112-112L (or 122-122L) and at least junior standing, or permission of instructor.

311-312. Physical Chemistry.

Fall, Spring. Credits: 3-3.

An introduction to the fundamental study of chemical phenomena using primarily the techniques of thermodynamics, quantum mechanics, and statistical mechanics.

Prerequisites: Chemistry 112-112L or 122-122L, Physics 111-112, 113L-114L and Mathematics 122.

Corequisite: Chemistry 311L-312L.

Recommended corequisite: Mathematics 223.

312L. Physical Chemical Laboratory.

Fall, Spring. Credits: 2.

Experimental study of physico-chemical systems, using research-oriented techniques. Designed to be taken with Chemistry 311-312. One laboratory period a week.

385-386. Chemistry Junior Seminar.

Fall, Spring. Credits: 0-1.

A seminar course required of all junior chemistry majors. The course consists of participation in departmental seminars, as well as instruction and discussion on information retrieval in chemistry and on technique and practice in oral presentation.

406. Instrumental Analysis.

Fall. Credits: 4.

A study of the principles and practice of absorption and emission spectroscopy, mass spectrometry, electroanalytical chemistry, chromatography, radiochemical methods, infrared and nuclear magnetic resonance spectroscopies. Emphasis is placed on understanding the major instrumental tools a chemist may use to study chemical phenomena. Two lectures and two laboratory periods a week.

Prerequisites: Chemistry 112-112L (or 122-122L), 211-212, 211L-212L, 311-312, and 312L, or permission of instructor.

408. Advanced Inorganic Chemistry.

Spring. Credits: 3.

A survey of experimental and theoretical inorganic chemistry, with emphasis on topics of current interest. Six laboratory periods during the semester.

Prerequisites: Chemistry 122-122L, 211-212, 211L-212L, 311-312, and 312L.

Recommended corequisite: Chemistry 406.

414. Biochemistry.

Fall. Credits: 3.

A survey of the chemistry of carbohydrates, lipids and proteins, and their metabolism in living organisms. The kinetics and bioenergetics of enzymatic reactions in metabolic pathways will also be studied.

Prerequisites: Chemistry 112-112L (or 211-212) and 211L-212L, or permission of instructor

415. Advanced Biochemistry.

Spring. Credits: 3.

A study of the flow of genetic information from DNA to proteins, including transcription, mRNA processing, and translation. Aspects of molecular physiology will also be investigated.

Prerequisites: Chemistry 414.

422. Advanced Organic Chemistry.

Spring. Credits: 3.

Modern theories of organic chemistry with emphasis on advanced synthetic methods and reaction mechanisms.

Prerequisites: Chemistry 211-212 and 211L-212L.

432. Advanced Physical Chemistry.

Fall. Credits: 3.

A continuation of Chemistry 312, with more detailed treatments of quantum chemistry, statistical mechanics, and spectroscopy.

Prerequisites: Chemistry 311-312, and 311L-312L, Mathematics 122.

442. Polymer Chemistry.

Spring. Credits: 3.

The study of macromolecules and polymer systems, emphasizing their organic chemical structure. Polymerization technologies covered will include step, chain, and ring-opening polymerizations. Structural features covered will include macroscopic physical properties and phenomena involving synthetic and naturally occurring polymers.

Prerequisites: Chemistry 211-211L and 212-212L.

451, 452. Introduction to Research.

Fall, Spring. Credits: 1-3,1-3.

Original investigations undertaken by junior and senior chemistry majors of chemical or biochemical problems usually related to research being carried on by members of the department. A maximum of 12 credit hours may be earned. For degree purposes three semester hours of 451 and/or 452 will be equivalent to a course even if these hours are not all taken in the same semester. Sophomores interested in research should pursue such interest through Directed Inquiries.

460. Chemistry Internship.

Fall, Spring. Credits: 1-3, 1-3.

A course designed to give students practical experience in chemical research and technology, guided by a chemical professional mentor. Students may work on or off campus, depending upon the preferences of the sponsoring company or institution. Examples of possible work arenas are chemical manufacturing studies, product discovery or improvement Research & Development, or forensic characterization. Students will be required to submit a written report and give an oral presentation at the end of the internship.

Prerequisites: Chemistry 211-212, and permission of the Departmental Program Director. Pass/fail basis only. Chemistry 460 does not satisfy an upper level Chemistry course requirement for the major.

485-486. Chemistry Senior Seminar.

Fall, Spring. Credits: 0-2.

A seminar course required of all senior chemistry majors. The course is designed to promote independent thinking, integration of topics in chemistry, and to provide practice in group discussion and in written and oral presentation.

495-496. Honors Tutorial.

Fall, Spring. Credits: 3-6.

Open to candidates for honors in chemistry. Includes supervised honors research in a chemical or biochemical field of study.

Prerequisites: Departmental permission.