Course Descriptions for Chemistry

CHEMISTRY (CHEM) (24)

CHEM-100. INTRODUCTORY CHEMISTRY 4:3:3

A course covering the basic concepts of chemistry. Three (3) lectures and one (1) three-hour laboratory period per week.

Credit, four hours.

CHEM-101. GENERAL AND ELEMENTARY ANALYTICAL CHEMISTRY I 4:3:3

This course is the first in two-semester sequence in a comprehensive study of the chemical and physical properties of matter including the fundamental principles of qualitative and quantitative analysis. Topics include atomic theory and bonding, stoichiometry, thermochemistry, and states of matter. The course is designed for science and other majors which require a thorough understanding of the current content knowledge in the fundamentals of chemistry. Three (3) lectures and one (1) three-hour laboratory period per week. Offered Fall, Spring and Summer 1

Corequisites: MTSC-121, MTSC-122 or MTSC-251 or MTSC-131.

Credit, four hours.

CHEM-102. GENERAL AND ELEMENTARY ANALYTICAL CHEMISTRY II 4:3:3

This course is the second in two-semester sequence in a comprehensive study of the chemical and physical properties of matter including the fundamental principles of qualitative and quantitative analysis. Topics include solutions, kinetics, equilibria, free energy, electrochemisty, and an introduction to specific areas in chemistry. The course is designed for science and other majors which require a thorough understanding of the current content knowledge in the fundamentals of chemistry. Three (3) lectures and one (1) three-hour laboratory period per week. Offered Fall, Spring and Summer 2

Prerequisites: CHEM-101.

Corequisites: MTSC-121, MTSC-122.

Credit, four hours.

CHEM-107. CHEMISTRY FOR THE HEALTH SCIENCES 4:3:3

A unified study of the fundamentals of general chemistry and the elements of organic and biochemistry. (Not recommended for majors in the Biological Sciences, or for Pre-Medical students.) Three (3) lectures and one (1) three-hour laboratory period per

week.

Prerequisites: High school Chemistry or its equivalent.

Corequisites: MTSC-101, MTSC-102 or MTSC-103 or MTSC-121 and MTSC-122.

Credit, four hours.

CHEM-191. UNIVERSITY SEMINAR I – CHEMISTRY 1:2:0

University Seminar is a two-semester, General Education course sequence designed to provide students with the essentials for a smooth transition to college life and academic success. Academic skills will be developed. These skills include critical reading, thinking, listening, writing, speaking, and using the library, the Internet, and word processing. Values clarification, coping with peer pressures, and the impact of a healthy lifestyle will be addressed. Opportunities will be provided for self-evaluation and growth in basic learning strategies as well as personal and career goals. Knowing the history of the University, feeling connected to the institution, and sharing a common educational experience with other freshmen are important goals of this course.

Credit, one hour.

CHEM-192. UNIVERSITY SEMINAR II – CHEMISTRY 1:1:0

University Seminar is a two-semester, General Education course sequence designed to provide students with the essentials for a smooth transition to college life and academic success. Academic skills will be developed. These skills include critical reading, thinking, listening, writing, speaking, and using the library, the Internet, and word processing. Values clarification, coping with peer pressures, and the impact of a healthy lifestyle will be addressed. Opportunities will be provided for self-evaluation and growth in basic learning strategies as well as personal and career goals. Knowing the history of the University, feeling connected to the institution, and sharing a common educational experience with other freshmen are important goals of this course.

Credit, one hour.

CHEM-202. FORENSIC CHEMISTRY 4:3:3

Theory and principle in the isolation and identification of drugs using chromatographic and spectroscopic methods. Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: CHEM-101, CHEM-102.

Credit, four hours.

CHEM-203. WATER CHEMISTRY – BASIC PRINCIPLES 4:3:3

Essentials of water chemistry with emphasis on the principle methods of testing water and wastewater. Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: CHEM-101, CHEM-102, MTSC-121, MTSC-122 or MTSC-105 and MTSC-106.

Credit, four hours.

CHEM-205. ELEMENTARY ORGANIC CHEMISTRY 4:3:3

A course covering nomenclature, properties and reactions of the simpler classes of organic compounds. (Not recommended for majors in the Biological Sciences or for Pre-Medical students.) Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: CHEM-101, CHEM-102.

Credit, four hours.

CHEM-301. ORGANIC CHEMISTRY I 4:3:3

Structure, synthesis, and reactions of the principle classes of organic compounds with stress on stereochemistry, reaction mechanisms, and spectroscopic properties. Laboratory practice in the separation, identification, and synthesis of organic compounds. Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: CHEM-101, CHEM-102.

Credit, four hours.

CHEM-302. ORGANIC CHEMISTRY II 4:3:3

Structure, synthesis, and reactions of the principle classes of organic compounds with stress on stereochemistry, reaction mechanisms, and spectroscopic properties. Laboratory practice in the separation, identification, and synthesis of organic compounds. Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: CHEM-101, CHEM-102, CHEM-301.

Credit, four hours.

CHEM-303. PHYSICAL CHEMISTRY I 4:3:3

A quantitative study of the fundamental physiochemical principles of matter as applied to gases, liquids, solids, and solutions, with illustrative laboratory experiments. Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: CHEM-301, CHEM-302, MTSC-251, MTSC-252, PHYS-201, PHYS-202.

Credit, four hours.

CHEM-304. PHYSICAL CHEMISTRY II 4:3:3

A quantitative study of the fundamental physiochemical principles of matter as applied to gases, liquids, solids, and solutions, with illustrative laboratory experiments. Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: CHEM-301, CHEM-302, MTSC-251, MTSC-252, PHYS-201, PHYS-202.

Credit, four hours.

CHEM-305. ANALYTICAL CHEMISTRY 4:3:3

Principles of gravimetric, volumetric, potentiometric, and spectrophotometric analysis. Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: Eight (8) credit hours of General Chemistry, MTSC-121, MTSC-122 or MTSC-105, MTSC-106.

Credit, four hours.

CHEM-306. INSTRUMENTAL ANALYSIS 4:3:3

Theoretical principles and chemical applications of instrumental methods of analysis. Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: CHEM-301, CHEM-302, and CHEM-305, MTSC-251, MTSC-252, PHYS-201, PHYS-202.

Credit, four hours.

CHEM-308. INORGANIC CHEMISTRY 4:3:3

A study and characterization of the fundamental concepts in inorganic chemistry which includes atomic structure, periodicity, and the nature of chemical forces and structure. The chemistries of transition metals, S fillers and P fillers, and organic metallic compounds. Laboratory practice in synthesis of pure inorganic substances. Three (3) lectures and one (1) three-hour laboratory period per week.

Corequisites: CHEM-304.

Credit, four hours.

CHEM-310. ENVIRONMENTAL CHEMISTRY 4:3:3

The analyses of water, soil, plant, and animal tissues for various parameters including trace organics and metals using classical and instrumental methods of analysis.

Prerequisites: CHEM-302.

Credit, four hours.

CHEM-401. ORGANIC QUALITATIVE ANALYSIS 3:2:3

Spectroscopic and chemical methods of identification of organic compounds in the pure state and in mixtures. Two (2) lectures and

one (1) three-hour laboratory period per week.

Prerequisites: CHEM-301, 24-302, 24-306.

Credit, three hours.

CHEM-402. ADVANCED ORGANIC CHEMISTRY 3:3:0

Advanced study of the structures of organic compounds, organic reaction, and their mechanisms. Synthesis of selected organic compounds using advanced preparative methods. Three (3) lectures and per week.

Prerequisites: CHEM-301, CHEM-302, CHEM-303, CHEM-304.

Credit, three hours.

CHEM-403. BIOCHEMISTRY 4:3:3

The structural and metabolic relationship of carbohydrates, lipids, amino acids, proteins, nucleic acids, enzymes, and coenzymes. Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: CHEM-301, CHEM-302, CHEM-303.

Credit, four hours.

CHEM-404. ADVANCED PHYSICAL CHEMISTRY 3:3:0

Advanced treatment of thermodynamics, the elements of quantum and statistical mechanics, chemical kinetics, and selected topics. Three (3) lectures per week.

Prerequisites: CHEM-303, CHEM-304.

Credit, three hours.

CHEM-405. INDEPENDENT STUDY AND RESEARCH 3:0:9

Independent investigation of a research problem under the supervision of a staff member. A research report and presentation is required. Three (3) three-hour laboratory periods per week.

Prerequisites: Senior status in Chemistry. The course may be repeated with the consent of the Department Chair.

Credit, three hours.

CHEM-406. SELECTED TOPICS IN CHEMISTRY 3:3:0

Topics of current interest in analytical, organic, inorganic, physical, or biochemistry.

Prerequisites: Senior status in Chemistry. The course may be repeated with the consent of the Department Chair.

Credit, three hours.

CHEM-407. SEMINAR IN CHEMISTRY 1:1:0

Reports, study, and discussion of current literature in the fields of chemistry. An oral presentation is required. One hour per week.

Credit, one hour.

CHEM-409. WATER CHEMISTRY – ADVANCED TECHNIQUES 4:3:3

Theory and application of modern chemical instrumentation to water analysis. Three (3) lectures and one (1) three-hour laboratory period per week.

Prerequisites: CHEM-203.

Credit, four hours.

CHEM-460. CHEMICAL LITERATURE 1:1:0

Use of the chemical library, chemical journals, reference works, other technical publications, assembling and data use, and computer-assisted literature searches. One lecture per week.

Credit, one hour.

CHEM-462. CHEMICAL TOXICOLOGY 3:3:0

A study of the adverse effects of chemical substances. Course includes the general principles of toxicology, the toxicology of systems, toxic agents, environmental toxicology, forensic toxicology, applications toxicology, and the effects of toxic substances on reproduction and the body.

Credit, three hours.

CHEM-469. POLYMER CHEMISTRY 3:3:0

An introduction to the chemistry of macromolecules including biological molecules, plastics, and other important classes of industrial polymers.

Prerequisites: CHEM-301,CHEM4-302.

Credit, three hours.

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