

CHEMISTRY AND PHYSICS

Office: Room 6018
Phone: 718.489.5453

Department Mission

Within the context of a liberal education, the department provides courses that expose students to the information, knowledge, and methods used in the physical sciences. In general, the purpose of the major is to prepare students for graduate and professional schools as well as for careers in the chemical, biotechnical or pharmaceutical industries. The department encourages Chemistry majors to fully explore the chemical sciences and allied fields through participation in research, seminars, and science-based clubs and activities. Department advisors assist students in exploring career possibilities and in devising a personalized plan of study that will best prepare them for their career goals.

Goals and Objectives

PLO 1: Demonstrate quantitative proficiency through use of appropriate mathematical concepts applied to science.

PLO 2: Demonstrate an understanding of structure, chemical properties, and reactions of chemicals and biomolecules, and be able to communicate that knowledge.

PLO 3: Demonstrate practical competence by safely conducting, drawing valid conclusions, and communicating results from experimental data.

PLO 4: Understand the principles behind, and demonstrate competency, when using modern instrumentation.

Programs

No results were found.

Courses

CHE-1000 Chemistry in Society (3 Credits)

Designed for non-science majors. Chemical principles are developed and applied to a series of major societal/technological issues such as global warming, water quality, acid rain, food additives, alternate energy sources, etc. Three lecture hours per week. 3 credits. Every year; day and evening.

Typically offered: Fall Only

CHE-1101 Chemistry and Life I (4 Credits)

Requisite(s): MAT-1101 or higher, CHE-1101L, CHE-1101R

Intended for non-science majors. Introduction to basic principles of chemistry; emphasis on application of these principles to living systems and their impact on present-day living. Two lecture, one recitation, and three lab hours per week. Lab fee.

Fulfills General Education Requirement: NPW

Typically offered: Fall Only

CHE-1102 Chemistry and Life II (4 Credits)

Requisite(s): CHE-1101 or CHE-1201, CHE-1102L, CHE-1102R

Continuation of CHE 1101. Lab fee.

Fulfills General Education Requirement: NPW

Typically offered: Spring Only

CHE-1105 Chemistry for Health Sciences (4 Credits)

Requisite(s): MAT-1101 or placement by examination, Take CHE-1105R and CHE-1105L;

This course is an introductory chemistry course for students in nursing and other health sciences. This course is intended to provide students with a descriptive background in general, organic, and biochemistry. Subsequent courses taken such as nutrition and pharmacology can be appreciated on a molecular level. The first part of the course will focus on the fundamentals of general chemistry dealing with the nature of atoms, atomic structure, bonding, and the role of nuclear chemistry in medicine. The 2nd half of the course will focus on the structure and nomenclature of organic, biomolecules, and their role in health-related systems.

Typically offered: Fall Only

CHE-1201 General Chemistry I (5 Credits)

Requisite(s): CHE-1201L, MAT-1105 or higher (Except MAT-2301), BIO-1201, CHE-1201R

Intended for science majors. Emphasis on quantitative aspects of chemistry at a more specialized level than in CHE 1101/CHE 1102. The course begins with an investigation of the ways in which we represent atoms and molecules symbolically, and their structures and spectroscopic signals. We then consider properties related to their physical states: gases, liquids, and solids. Finally, we scale up our investigation to explore how we relate the submicroscopic realm of atoms and molecules to the physically observable macroscopic world by considering such concepts as stoichiometry and moles. Three lecture, one recitation, and three lab hours per week. Lab fee.

Fulfills General Education Requirement: NPW

Typically offered: Fall Only

CHE-1202 General Chemistry II (5 Credits)

Requisite(s): CHE-1201, CHE-1202L, CHE-1202R, MAT-1107, BIO-1202

Continuation of CHE 1201. Emphasis is placed on a systematic examination of chemical processes that includes thermodynamics, kinetics, equilibria, acid-base properties, and electrochemistry. Lab fee.

Fulfills General Education Requirement: NPW

Typically offered: Spring Only

CHE-2001 Biochemical Science (4 Credits)

Requisite(s): CHE-1202, Take CHE-2001L and CHE-2001R

For Physician Assistant majors only. This course surveys the basic principles of organic chemistry and biochemistry. The organic chemistry section emphasizes the behavior of organic polymers, setting a foundation for the understanding of proteins and nucleic acids. The biochemical principles covered in this course are selected to provide a background for the study of some of the more common and/or significant diseases. Three lecture, one recitation, and two lab hours per week. Lab fee.

Typically offered: Fall Only

CHE-2050 Analytical Chemistry (4 Credits)

Requisite(s): CHE-1202, CHE-2050L, CHE-2050R

Quantitative study of gravimetric and volumetric analysis; solubility product, acid-base, oxidation-reduction, and complex-formation phenomena considered with emphasis upon precision, resourcefulness, and chemical calculations. Two lecture, one recitation, and three lab hours per week. Lab fee.

Typically offered: As Needed

CHE-2101 Organic Chemistry I (5 Credits)

Requisite(s): CHE-1202, previous, CHE-2101L, concurrent, CHE-2101r, concurrent

Aromatic and aliphatic compounds, reaction mechanisms based on electronic theory, preparation of representative compounds, and quantitative analysis. Three lecture, one recitation, and four lab hours per week. Lab fee.

Typically offered: Fall Only

CHE-2102 Organic Chemistry II (5 Credits)

Requisite(s): CHE-2101, CHE-2102L, CHE-2102r

Continuation of CHE 2101. Lab fee.

Typically offered: Spring Only

CHE-2301 Inorganic Chemistry (4 Credits)

Requisite(s): CHE-1202

The study of bonding, structure, and reactions of inorganic compounds based on modern physical chemical concepts, coordination compounds, and organometallic compounds. Three lecture hours per week.

Typically offered: As Needed

CHE-3001 Biochemistry (4 Credits)

Requisite(s): CHE-2102, CHE-3001L

Physicochemical approach, amino acids, proteins, carbohydrates, lipids, enzymes, intermediate metabolisms, modern techniques for isolation, identification, and determination of biochemical significance. Three lecture and four lab hours per week. Lab fee.

Typically offered: Spring Only

CHE-3002 Bio-Analytical Chemistry (4 Credits)

Requisite(s): CHE-2102, CHE-3002L, PHY-2002

For biology majors only. Theoretical and practical knowledge of modern analytical chemistry including statistics, volumetric and gravimetric analysis, chemical and electrochemical equilibrium, acid-base, and chemistry. Introduction to instrumental methods of analysis including spectrophotometry, FT-IR, and Chromatography (HPLC, GC-MS, GC). Two lecture and five lab hours per week. Lab fee.

Typically offered: Fall Only

CHE-4001 Physical Chemistry I (4 Credits)

Requisite(s): CHE-2102, CHE-4001L, MAT-2203, PHY-2002

Atomic, molecular and crystal structure; thermodynamics; solution properties; chemical kinetics; and electrochemistry. Three lecture and four lab hours per week. Lab fee.

Typically offered: As Needed

CHE-4002 Physical Chemistry II (4 Credits)

Requisite(s): CHE-4001, CHE-4002L

Continuation of CHE 4001. Lab fee.

Typically offered: As Needed

CHE-4050 Instrumental Methods of Analysis (4 Credits)

Requisite(s): CHE-4001, CHE-4050L, CHE-2050

Theory and laboratory work in spectroscopy, absorption, and emission; electroanalytical chemistry and chromatography as they apply to analytical chemistry. Three lecture and four lab hours per week. Lab fee.

Typically offered: Fall Only

CHE-4101 Advanced Organic Chemistry (3 Credits)

Requisite(s): CHE-2102

Physical organic chemistry, emphasis on structure and reaction mechanisms; free radical chemistry. Three lecture hours per week.

Typically offered: As Needed

CHE-4990 Internship in Chemistry (1-2 Credits)

Students may intern during the summer at approved research and development companies. The student must maintain a comprehensive daily log of work activities signed by their supervisor to be reported to the Chairperson when requested. Internships must be approved by the department Chairperson.

Typically offered: As Needed

CHE-4993 Chemical Research I (3 Credits)

Independent laboratory research under faculty guidance.

Typically offered: As Needed

CHE-4994 Chemical Research II (3 Credits)

Requisite(s): CHE-4993

Continuation of CHE 4993.

Typically offered: As Needed

CHE-4995 Independent Study in Chemistry (1-5 Credits)

Individual research in an approved area. Library research, conferences, report, or special project. Approval of the department Chairperson is required.

Typically offered: As Needed

CHE-4996 Independent Study in Chemistry (1-4 Credits)

Individual research in an approved area. Library research, conferences, report, or special project. Approval of the department Chairperson is required.

Typically offered: As Needed

CHE-4998 Senior Project (3 Credits)

Requisite(s): Open to seniors in Chemistry majors

Individual investigation in some special field of chemistry, may involve literature or laboratory research. Required of majors in senior year.

Typically offered: As Needed

CHE-5001 Honors Seminar: Understanding Our Environment (3 Credits)

At the heart of the Franciscan tradition is a quest to live a more moral and authentic life where our role is to serve as custodians of the earth. As custodians it is vital that we acknowledge the current state of our environment and to act in ways that improve that status. To this end it is necessary to be able to evaluate information pertaining to the environment and to place that information in its proper perspective. This course will lead us in an investigation of the history of environmentalism, the speciation and toxicology of chemicals, health and quality of life issues, regulatory controls, the economy, and politics. We will then examine in greater depth a number of current and historical environmental cases. By the end of this course you should be able to critically evaluate issues of environmental concern and to determine the best way that we as individuals, and as a group, can be agents of positive change and, thereby proceed as custodians of the earth.

Fulfills General Education Requirement: NPW, SEH

Typically offered: Fall Only

CHE-5002 A Short History of Nearly Everything Environment (3 Credits)

Science is not, as you may imagine, a series of technically dense theories, with heavy calculations and mind-bending feats of logic. Oh no! Science is interspersed with humour, betrayal, sadness; the full range of human experience. and a series of technically dense theories with heavy calculations and mind-bending feats of logic. This course will not only provide you with an overview of the best scientific ideas of what we currently understand, but also the various trials and tribulations of the personalities of those individuals that brought us those ideas.

Typically offered: Fall Only

Faculty Chairperson

Dr. Gerard Davidson

Professor

Califano
Wolfe

Associate Professor

Davidson
Helburn

Lab Instructor

Chowdhury

Adjuncts

Adebayo-Olojo
Bass
Bastos
Kahanda
Khajo
Neer
Ponnala
Smith
Telting-Diaz