

## Course Descriptions

represents an opportunity for all business majors to review, extend and apply all previous coursework completed in the business curriculum using strategic planning as a framework. This course will combine theory and practice, and will require active participation in a computer simulation game in which students will develop a cohesive strategy, formulate a business plan, “manage” a company, and report the results to a Board of Directors. Prerequisite: Senior Status. 3 hours Lecture and Discussion — 3 credits

### **BA 4247**

#### ***Advertising***

Planning, implementing, and evaluating advertising and sales promotion activities. Determining advertising objectives, selection of campaign themes and media, evaluating advertisements and campaigns, controlling advertising and promotion expenditures, the client-agency relationship, regulations and the social and economic effects of advertising. Prerequisite: Principles of Marketing. 3 hours Lecture and Discussion — 3 credits

### **BA 4145**

#### ***Sports Marketing and Media Relations***

A study of the basic principle of marketing and how it applies to sports, leisure and recreation. Provides the student an overview of the mass media industry as they interface with the sport industry. 3 hours Lecture and Discussion — 3 credits

### **Specialized Methods and Techniques**

Each major department offers a series of courses designed to acquaint the student with various applications of his/her professional specialty. In the Business Administration Program this requirement is fulfilled by satisfactory completion of IT 1011 Information Technology Concepts, IT 1012 Computer Applications and IT 1031 Intermediate Computer Applications.

### ***Employment Program***

### **BA 2370**

#### ***Employment Program***

Each student in Business Administration is required to spend 500 hours in approved jobs related to the student’s major. Registration for each Employment Program must occur prior to the beginning of a relevant experience. Registration materials are available from the Office of Career and Life Education, located in Segal Hall.

## Chemistry

### **CH 0011**

#### ***Basic Chemistry***

A non-credit lecture and laboratory course designed to prepare students for General Chemistry I and II. Energy, matter, and change with appropriate problem-solving applications will be emphasized. Formulas, equations, and descriptive chemistry will be covered in the laboratory. 3 hours Lecture and 3 hours Laboratory — 0 credits

### **CH 1001**

#### ***Chemistry Fundamentals***

This course presents basic chemical concepts to non-scientists. Students will gain the foundation of chemical knowledge so they can make informed personal and professional decisions. Lecture topics include structure, bonding and reactivity, water and solutions, and bio-organic and environmental chemistries. This course does not satisfy the requirement for General Chemistry I. 3 hours Lecture — 3 credits

### **CH 1001L**

#### ***Chemistry Fundamentals Laboratory***

Students will develop some familiarity with laboratory skills. This course is to be taken concurrently with or after having successfully completed the Chemistry Fundamentals lecture. 3 hours Laboratory — 1 credit

### **CH 1103**

#### ***General Chemistry I***

General Chemistry I is a course which introduces many of the basic principles of chemistry. Topics covered include atomic structure, periodic trends, molecular bonding and shapes, intermolecular forces and the properties of solutions. Also discussed are ionic and covalent compounds, the mole concept, chemical equations, stoichiometry, the major classes of chemical reactions, and thermochemistry. Prerequisites: high school chemistry. This course is to be taken concurrently with the General Chemistry I Laboratory. 3 hours Lecture — 3 credits

### **CH 1103L**

#### ***General Chemistry I Laboratory***

The experiments in the laboratory section are designed to reinforce the concepts discussed in lecture as well as to develop basic laboratory skills. Topics covered include unit conversion and nomenclature, redox and precipitation reactions, stoichiometry, calorimetry, titrations and molecular structure. This course is to be taken concurrently with or after

having successfully completed the General Chemistry I lecture. Three hours Laboratory — 1 credit.

### **CH 1203**

#### ***General Chemistry II***

General Chemistry II deals with chemical kinetics, the concept of ionic equilibria, buffer solutions, thermodynamics, electrochemistry, coordination compounds, and nuclear chemistry. Prerequisite: General Chemistry I and General Chemistry I Laboratory. This course is to be taken concurrently with the General Chemistry II Laboratory. 3 hours Lecture — 3 credits

### **CH 1203L**

#### ***General Chemistry II Laboratory***

The laboratory's experimental sequence is designed to enhance and develop laboratory technique. A large part of General Chemistry II Laboratory is devoted to qualitative and quantitative analysis of cations and anions. Chemical equilibrium is also covered. This course is to be taken concurrently with or after having successfully completed the General Chemistry II lecture. 3 hours Laboratory — 1 credit

### **CH 2003**

#### ***Principles of Organic Chemistry***

This course surveys both aliphatic and aromatic classes of compounds with their traditional subclasses. Basic reaction mechanisms are introduced and special topics, such as fats and oils, detergents, carbohydrates, and proteins are covered briefly. Prerequisite: General Chemistry I and II Lecture and Laboratory. This course should be taken concurrently with the Principles of Organic Chemistry Laboratory. 3 hours Lecture — 3 credits.

### **CH 2003L**

#### ***Principles of Organic Chemistry Laboratory***

The laboratory introduces the common techniques used for the separation, purification and identification of organic compounds, including chromatographic techniques and infrared spectroscopy. This course is to be taken concurrently with or after having successfully completed the Principles of Organic Chemistry lecture. 3 hours Laboratory — 1 credit.

### **CH 2007**

#### ***Introduction to Forensic Science***

This lecture/laboratory course is designed to acquaint the student with the principles of forensic science, to introduce the student to the different areas of forensic science, and to introduce the student to some applications of biological, chemical and physical methods

in the forensic sciences. Proper evidence handling is also discussed. Prerequisites: successful completion of at least two semesters of college chemistry. 3 hours Lecture and 3 hours Laboratory — 4 credits

### **CH 2120**

#### ***Organic Chemistry I***

The first of a two-course sequence on Organic Chemistry, this course reviews the basic concepts of bonding and of acid-base theory as they apply to organic compounds. The structure, properties, nomenclature and chemistry of the alkanes, alkyl halides, alkenes, alkynes and the alcohols are covered in-depth. The development of reaction mechanisms is discussed and the mechanisms for substitutions, eliminations and additions are studied and applied to the reactions of alkyl halides, alkenes and the alcohols. Prerequisites: General Chemistry II Lecture and Laboratory. This course should be taken concurrently with the Organic Chemistry I Laboratory. 3 hours Lecture — 3 credits

### **CH 2120L**

#### ***Organic Chemistry I Laboratory***

The Organic Chemistry I laboratory introduces the common techniques used for the separation, purification and identification of organic compounds, including chromatographic techniques and infrared spectroscopy. The reaction of the functional groups covered in Organic Chemistry I are studied. Prerequisites: General Chemistry II Lecture and Laboratory. This course should be taken concurrently with Organic Chemistry I lecture. 3 hours Laboratory — 1 credit.

### **CH 2220**

#### ***Organic Chemistry II***

The second of the two course sequence on Organic Chemistry, this course is an introduction to the structure, properties, nomenclature and chemistry of the aromatic compounds, ketones, aldehydes, the carboxylic acids and their derivatives and the amines. The mechanisms of aromatic substitution, of additions, reductions and oxidations of the carbonyl compounds and the synthesis and reactions of the amines are studied. The role of organic compounds in biological systems is introduced throughout the course. Prerequisites: Organic Chemistry II Lecture and Laboratory. This course should be taken concurrently with the Organic Chemistry II Laboratory. 3 hours Lecture — 3 credits.

## Course Descriptions

### CH 2220L

#### **Organic Chemistry II Laboratory**

The Organic Chemistry Laboratory includes the study of the reactions and mechanisms covered in the Organic Chemistry II lecture. An introduction to qualitative organic analysis and to Nuclear Magnetic Resonance spectroscopy is also included. Prerequisite: Organic Chemistry I Lecture and Laboratory; Prerequisite or concurrent: Organic Chemistry II lecture. 3 hours Laboratory — 1 credit.

### CH 2155-CH 2256

#### **Selected Topics I and II**

A discussion and laboratory course dealing with modern chemical concepts. The student, with concurrence from the instructor, will investigate in depth a topic of his/her choice. Example topics include inorganic syntheses, glassblowing, radiochemistry, and symmetry. Elective for Chemistry sophomores, juniors or seniors with permission of Department Chairperson. 3 hours Laboratory and Instruction each — 1 credit each

### CH 2201

#### **Chemical Literature**

This course includes a discussion of the content and the usage of the various sources of chemical information. Emphasis is placed both on locating specific facts and on on-line literature searches. Regular library assignments are given, and the class as a whole visits a large chemical library in the area. Prerequisite: At least sophomore standing. 1 hour Lecture — 1 credit

### CH 2203

#### **Biochemistry**

A systematic survey of the major biological molecules, including proteins, carbohydrates, lipids, and nucleic acids. This course introduces students to the general principles of biochemistry and illustrates the interplay of molecular structure and function. Topics covered may include protein architecture, enzyme kinetics and mechanism, membrane and transportation, molecular genetics, and the central metabolic pathways. Prerequisite: Principles of Organic Chemistry Lecture and Laboratory or Organic Chemistry I Lecture and Laboratory. 3 hours Lecture — 3 credits

### CH 2203L

#### **Biochemistry Laboratory**

The laboratory introduces common techniques used for the separation, purification, identification and analysis of biochemical compounds. Various types of

chromatography, electrophoresis and spectroscopy are studied. Prerequisite: Organic Chemistry I Lecture and Laboratory or Principles of Organic Chemistry Lecture and Laboratory. This course is to be taken concurrently with or having successfully completed Biochemistry lecture. 3 hours Laboratory — 1 credit

### CH 3001

#### **Introductory Biomedical Instrumental Methods**

A survey, in both theory and practice, of the various types of instrumentation used in the biomedical and pharmaceutical research fields. Laboratory work includes gaining experience with various types of spectroscopic, chromatographic, colorimetric, radiochemical and radiographic equipment. Prerequisites: General Chemistry I and II Lecture and Laboratory. Organic Chemistry and Biochemistry with Laboratory are also desirable. 2 hours Lecture and 3 hours Laboratory — 3 credits

### CH 3122

#### **Radioisotope Techniques**

Introductory lecture course dealing with the properties of radiation, elementary radioisotope calculations, and chemical, medical and biological uses of radioisotopes. Prerequisite: Permission of Instructor. 3 hours Lecture and Discussion — 3 credits

### CH 3125

#### **Physical Chemistry I**

This course covers the general areas of equations of state for real gases, the laws of thermodynamics and their applications, thermochemistry, homogeneous equilibria, phase equilibria, and electrochemistry. Prerequisites: Calculus II and Physics II or Permission of Instructor. This course is to be taken concurrently with the Physical Chemistry I Laboratory. 3 hours Lecture — 3 credits

### CH 3125L

#### **Physical Chemistry I Laboratory**

The laboratory reinforces the topics covered in Physical Chemistry I. Various types of calorimetry are studied as well as experiments with vapor pressure, gas viscosity, heat capacity and phase equilibria. This course is to be taken concurrently with or after having successfully completed Physical Chemistry I lecture. 3 hours Laboratory — 1 credit.

### CH 3130

#### **Analytical Chemistry**

This course includes gravimetric and volumetric methods of analysis as well as an introduction to col-

ometric, electro-analytical, and chromatographic techniques. Prerequisites: General Chemistry I and II. 3 hours Lecture and 4 hours Laboratory — 4 credits

**CH 3220*****Advanced Organic Chemistry***

Organic reaction mechanisms and their modification by inductive, resonance, and steric effects are covered in depth. Also discussed are methods of determining reaction mechanism, stereochemistry, orbital symmetry relationships, and selected topics in synthesis. Prerequisites: Organic Chemistry II Lecture and Laboratory and Physical Chemistry II lecture and laboratory. 3 hours Lecture — 3 credits

**CH 3223*****Instrumental Analysis***

A survey of the sources of chemical signals, and their detection and amplification by instrumental methods. Laboratory work includes visible-ultraviolet and infrared spectroscopy, gas chromatography, polarography, potentiometry, coulometry, and liquid chromatography. Prerequisites: Analytical Chemistry, and Physical Chemistry I or Permission of Instructor. 3 hours Lecture and 4 hours Laboratory — 4 credits

**CH 3224*****Physical Chemistry II***

This course covers kinetics, elementary quantum mechanics and its application to bonding theories. Basic theory of spectroscopy and diffraction and use in molecular structure determination including Fourier transforms, adsorption and heterogeneous catalysis, as well as transport mechanisms and dipole moments are also covered. Prerequisites: Physical Chemistry I Lecture and Laboratory and Ordinary Differential Equations or Permission of Instructor. 3 hours Lecture — 3 credits

**CH 3224L*****Physical Chemistry II Laboratory***

This course concentrates on experiments reinforcing topics covered in Physical Chemistry II. Typical experiments will include particle in a box, ionic strength measurements, X-ray diffraction and the theory and application of molecular spectroscopy. This course is to be taken concurrently with or after having successfully completed Physical Chemistry II Lecture. Prerequisites: Physical Chemistry I lecture and Laboratory. 3 hours Laboratory — 1 credit

**CH 4025*****Polymer Chemistry Introduction***

This course provides a fundamental understanding of terms and procedures employed in the polymer section of industry. Topics to be covered include polymer structure, synthesis and behavior; processing; environmental effects; and special materials, such as composites and biopolymers. Prerequisites: Organic Chemistry I and II. 3 hours Lecture — 3 credits

**CH 4041*****Senior Research***

Selected seniors engage in supervised investigations involving library work and laboratory experiments related to chemistry. Requirement: Permission of Department Chairperson. 1-3 credits

**CH 4117*****Organic Analysis***

This course teaches the identification of organic compounds through the use of physical properties, chemical tests, spectroscopic analysis, and preparation of known derivatives. Emphasis is placed on the modification of physical and chemical properties by steric and electronic effects. Infrared and ultraviolet spectrometers and a gas chromatograph are available for laboratory use. Computer simulations of compound identifications are an integral part of the program. Prerequisites: Instrumental Analysis and Organic Chemistry II Lecture and Laboratory or Permission of Instructor. 3 hours Lecture and 3 hours Laboratory — 4 credits

**CH 4126*****Advanced Inorganic Chemistry***

Present theories of chemical bonding are treated. These include electrostatic, valence bond, molecular orbital, and continuous solid models. From these the structures of inorganic substances are derived. Topics such as symmetry and Point Groups, nonaqueous solvent systems, secondary chemical forces, and structure and properties of transition metal complexes are treated. When time permits, a survey of organometallic chemistry is included. Prerequisite: Physical Chemistry II Lecture and Laboratory. 3 hours Lecture — 3 credits

**CH 4201*****Seminar (Chemistry)***

Student-led, in-depth discussions on specific chemical questions. 1 hour Lecture and Discussion — 1 credit

## Course Descriptions

### CH 4205

#### **Advanced Biochemistry**

A presentation of modern biochemical topics, including the chemistry of cellular compounds, energy transformation in living organisms, and the synthesis and properties of macromolecules. Prerequisites: Organic Chemistry I and II and Physical Chemistry I and II or Permission of Instructor. 3 hours Lecture and 3 hours Laboratory — 4 credits

### CH 4241

#### **Advanced Physical Chemistry**

A study of the physical chemistry of polymers with emphasis on polymerization kinetics, structure of polymers, and their physical properties and characterization methods. Prerequisite: Physical Chemistry II or Permission of Instructor. 3 hours Lecture — 3 credits

\* Students may substitute courses of equal credits in the sciences, computers, mathematics, or Business Administration with permission of Advisor and Department Chairperson.

### **Specialized Methods and Techniques**

### CH 2004

#### **Fire Protection Chemistry**

This course provides the student with the knowledge of the chemistry of materials and their physical properties as these subjects relate to fire. 1 hour Lecture and Discussion — 1 credit

### CH 2005

#### **Chemistry of Hazardous Materials**

This course covers the unique requirements in handling hazardous materials when they are encountered in a chemical emergency. 1 hour Lecture and Discussion — 1 credit

### CH 2006

#### **Safety in the Laboratory**

This course deals with the hazards associated with handling chemicals that have acute or chronic toxicities and/or physical hazards in the research laboratory setting. Prudent practices will be emphasized. 1 hour Lecture and Discussion — 1 credit

### CH 2131

#### **Descriptive Environmental Chemistry**

This course surveys inorganic chemistry with an environmental emphasis, geochemical cycles, aqueous equilibria, redox, bacterial processes, heavy metals, and atmospheric chemistry. Prerequisites: General Chemistry I and II Lecture and Laboratory. 1 hour Lecture and 2 hours Laboratory — 2 credits.

### CH 3157

#### **Advanced Inorganic Laboratory**

Inorganic and organometallic compounds are prepared using a variety of synthetic techniques and apparatus not encountered in the lower division laboratory courses. Students may select syntheses from the course collection or may suggest new ones from other sources such as the current literature. The course emphasizes the writing of a legal laboratory notebook. Prerequisites: Organic Chemistry I and II Lecture and Laboratory. Weekly individual laboratory conference and 3 hours Laboratory — 2 credits

### CH 4150

#### **Separation Methods**

The course will focus on the development of methods for laboratory scale separations which are driven by distribution equilibria or by external fields. The fundamental principles that govern separation at the molecular level will be discussed. The theory of chromatographic retention will be covered, followed by the study of the instrumentation required for gas, liquid and supercritical fluid chromatography and electrophoretic techniques. The application of theory and instrumentation to the development of methods will be stressed. Prerequisites: Biomedical Instrumentation or Instrumental Analysis. 1 hour lecture and 2 hours laboratory — 2 credits

### **Employment Program**

### CH 2370

#### **Employment Program**

Each student in Chemistry and Biochemistry is required to spend 500 hours in approved jobs related to the student's major. Registration for each Employment Program must occur prior to the beginning of a relevant experience. Registration materials are available from Career Services, located in Segal Hall. 500 hours of On-the-Job Training — 4 credits

## **COMPUTER AND BUSINESS INFORMATION SYSTEMS**

### IT 1011

#### **Information Technology Concepts**

This course introduces many fundamental concepts of computers and information technology. Lectures and discussions include computer hardware and software, Internet and World Wide Web, data file and database, telecommunications and networks, and future technology trends. 1.5 hours Lecture and