CHM Chemistry

CHM 100 Chemistry for the Health Sciences (3-3) 4 crs.
Introduces basic concepts of inorganic and organic chemistry and biochemistry. Emphasizes chemical principles applied to biological systems. Laboratory exercises apply theory to biological and consumer products. Especially designed for students in allied health sciences. Meets the prerequisite of the Nursing program. IAI P1 902L

CHM 103 The Chemistry Connection (3-3) 4 crs.
Introduces chemical principles to illustrate the significance of chemistry in the world today. Practical applications and current issues related to general chemistry, organic chemistry and biochemical topics will be integrated with chemical concepts. Recommended for non-science majors. IAI P1 903L

CHM 105 Chemical World (3-3) 4 crs.
Relates biological and physical systems to chemistry. Focuses on four major themes: the sociology of science, chemical composition and change, the chemistry of life, chemistry and society. Corresponding laboratory is inquiry based. Designed to provide a higher level of scientific literacy to non-science majors and to provide elementary education majors, in particular, with the content knowledge and disposition about science that is necessary in order to be able to teach science in engaging and meaningful ways to their students. Aligned with State of Illinois teacher preparation standards. IAI P1 903L
Prerequisite: MTH 080 or higher (or required math placement exam score) with a grade of C or better, or concurrent enrollment. https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf

CHM 110 Fundamentals of Chemistry (3-3) 4 crs.
Introduces concepts of chemistry. Emphasizes the composition of matter, the periodic table, the chemistry of solutions and chemical calculations. The laboratory experiments utilize many common household materials to demonstrate applications of chemical concepts. For students whose preparation does not permit enrollment in CHM 121. IAI P1 902L
Prerequisite: MTH 080 or higher with a grade of C or better or other placement options, or concurrent enrollment. https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf

CHM 121 General Chemistry I (4-3) 5 crs.
Studies principles of atomic and molecular structure, bonding, stoichiometry, states of matter, kinetic molecular theory, and solutions. Corresponding laboratory experiments include volumetric and gravimetric analyses, a qualitative study of reactions, visible spectrophotometry, and problem-based analyses. Intended for all students whose majors require general chemistry, including science majors and pre-professionals. The course also satisfies a general education laboratory science requirement for students with previous chemistry experience. IAI P1 902L, IAI CHM 911
Prerequisite: (Two semesters of high school chemistry or CHM 110 with a grade of C or better) AND (MTH 080 or higher with a grade of C or better, or placement options into MTH 103). https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf

CHM 122 General Chemistry II (4-3) 5 crs.
Continues CHM 121 as the second semester of a general chemistry sequence intended for all students whose major requires a full year of general chemistry, including science majors and pre-professionals. Includes the principles of chemical kinetics, equilibrium, acid-base reactions, electrochemistry, and thermodynamics. Also introduces topics in organic, nuclear, transition metal, and descriptive chemistry. Laboratory includes experiments related to the lecture material. IAI CHM 912
Prerequisite: CHM 121 with a grade of C or better, or consent of instructor.

CHM 125 Organic and Biochemistry for the Health Sciences (3-3) 4 crs.
Introduces principles and health applications of organic chemistry and biochemistry. Studies the structure, nomenclature and reactions of organic compounds. Also studies carbohydrates, lipids, proteins, enzymes, nucleic acids, metabolic pathways and bioenergetics. Includes related laboratory exercises. Intended for students in the allied health sciences but open to all non-physical science majors.
Prerequisite: CHM 110 or CHM 121 with a grade of C or better.

CHM 201 Basic Organic Chemistry (3-3) 4 crs.
Surveys topics of organic chemistry covering nomenclature, structure, reactions and synthesis of the major classes of organic compounds, including hydrocarbons, alcohols, aldehydes, ketones, carboxylic acids and amines. The laboratory includes experiments in distillation, crystallization, chromatography, extraction, synthesis and analysis.
Prerequisite: CHM 100, CHM 110, or CHM 121 with a grade of C or better, or consent of instructor.

CHM 204 Organic Chemistry I (3-6) 5 crs.
Applies modern theories of electronic structures to the study of chemical and physical properties of alkanes, alkenes, alkynes, and alkyl halides. Students also study reaction mechanisms and stereochemistry as they apply to the above classes of organic compounds. Laboratory includes syntheses, qualitative organic analyses, IR and visible spectrophotometry, gas chromatography, thin layer chromatography, HPLC, polarimetry, and refractometry. Intended primarily for science majors and pre-professionals. IAI CHM 913
Prerequisite: CHM 122 with a grade of C or better, or consent of instructor.

CHM 205 Organic Chemistry II (3-6) 5 crs.
Continues CHM 204 with further study of nomenclature, stereochemistry, reactions, and mechanisms of the following functional groups: conjugated dienes, aromatics, alcohols, ethers, aldehydes, ketones, carboxylic acids and their derivatives, and nitrogen containing compounds. Laboratory includes syntheses, qualitative organic analyses, NMR, IR and UV-Vis spectrophotometry, gas chromatography, thin layer chromatography, HPLC, polarimetry, and refractometry. Intended primarily for science majors and pre-professionals. IAI CHM 914
Prerequisite: CHM 204 with a grade of C or better.

CHM 210 Quantitative Analysis (3-6) 5 crs.
Introduces theory and applications of sampling and quantitative chemical analysis with a focus on acid-base equilibria, complexation, extraction and chromatography, solubility, precipitation, redox reactions, and activity. Considerable emphasis is placed on extended equilibrium concepts and the fundamentals of spectroscopy. Laboratory experiments are related to lecture topics; they emphasize experimental precision and accuracy and include spreadsheet-based computer calculations.
Prerequisite: CHM 122 or equivalent with a grade of C or better.

CHM 220 Biochemistry (3-3) 4 crs.
Introduces the chemical and physical properties of all classes of biological molecules and their assemblies including small molecules, macromolecules, and processes found in living organisms. Includes structures of amino acids, nucleotides, lipids, and sugars, as well as their corresponding macromolecular structures, i.e., proteins, nucleic acids, membranes, and polysaccharides as related to their biological functions; kinetics and mechanism of enzymatic reactions, the central metabolic pathways, and the genetic code. Introduces current biochemical techniques and the proper use of laboratory tools and equipment utilized in a biochemistry lab.
Prerequisite: CHM 122 with a grade of “C” or better and either CHM 201 or CHM 204 with a grade of “C” or better or consent of the instructor.

CHM 295 Independent Research in Chemistry I (0-3 to 0-9) 1-3 crs.
Provides experimental exploration of an authentic scientific research topic under the supervision of a faculty member. This laboratory course is designed to teach the principles and practice of modern experimental chemistry. Before registering, students must submit to the Chemistry Department a contract with the instructor for accomplishing a defined research task. Credit is contingent on the submission of a final report.
Prerequisite: CHM 121 with a grade C or better, prior consultation with instructor, completed contract, and consent of the department chair.

CHM 296 Independent Research in Chemistry II (0-3 to 0-9) 1-3 crs.
Provides additional opportunity for students to do experimental exploration of an authentic scientific research topic under the supervision of a faculty member. This laboratory course is designed to give students more time to work on a research project. Before registering, students must submit to the Chemistry Department a contract with the instructor for accomplishing a defined research task. Credit is contingent on the submission of a final report.
Prerequisite: CHM 295 with a grade B or better, prior consultation with instructor, completed contract and consent of the department chair.

CHM 297 Independent Research in Chemistry III (0-0 to 3-9) 1-3 crs.
Provides additional opportunity for students to do experimental exploration of an authentic scientific research topic under the supervision of a faculty member. This laboratory course is designed to give students more time to work on a research project. Before registering, students must submit to the Chemistry Department a contract with the instructor for accomplishing a defined research task. Credit is contingent on the submission of a final report.
Prerequisite: CHM 296 with a grade B or better, prior consultation with instructor, completed contract, and consent of the department chair.