### COURSES FOR CHEMISTRY

#### Chemistry Courses

**CH100 General Chemistry I - Plus**

*Hours 5*

This course is designed for students with lower level math backgrounds to successfully complete the freshman level entry course in general chemistry, a foundational and core science survey course. This is a proposed 5 credit hr course for students who are taking, or meet the requirements to take, MATH 112 or 113 and who do not have placement into at least MATH 115. Analysis shows such students to be at high risk (~ 50%) for a DFW outcome in the traditional CH101 general chemistry course. Chemistry topic coverage for CH100 is identical to that of CH101 (ch 1-11, Tro textbook), but the course content is expanded to include additional development of basic science, chemistry, math, and problem solving skills. Additional lecture time is included for instruction in these areas, including added supervised problem solving and mentoring of these students to better prepare and train them for successful completion of the first semester of general chemistry. Student who receive credit for CH100 will qualify to subsequently take CH102. Students cannot receive credit for both CH 100 and CH 101.

Prerequisite(s): MATH 100 or MATH 112 or higher
Prerequisite(s) with concurrency: MATH 112 or MATH 113 or higher

#### Natural Science

**CH101 General Chemistry**

*Hours 4*

Three lectures and one three-hour laboratory. Degree credit is not awarded for both CH 101 and CH 107 or for both CH 101 and CH 117. A survey of the fundamental facts, principles, and theories of general chemistry. Usually offered in the fall, spring, and summer semesters.

Prerequisite(s): MAPL of 467 or higher or ACT of 24 or higher or SAT of 560 or higher or MATH 100 or MATH 112 or MATH 113 or MATH 115 or MATH 121 or MATH 125 or MATH 126 or MATH 145 or MATH 146 or MATH 100 or MATH 112 or MATH 113 or MATH 115 or MATH 121 or MATH 125 or MATH 126 or MATH 145 or MATH 146

Prerequisite(s) with concurrency: MATH 112 or MATH 113 or MATH 115 or MATH 121 or MATH 125 or MATH 126 or MATH 145 or MATH 146

#### Natural Science

**CH102 General Chemistry**

*Hours 4*

Three lectures and one three-hour laboratory. Degree credit is not awarded for both CH 102 and CH 105 or both CH 102 and CH 108. Continuation of CH 101, with basic inorganic chemistry. Includes a systematic study of the elements and the structures, properties, and reactions of their compounds. Usually offered in the fall, spring, and summer semesters.

Prerequisite(s): CH 101 or CH 117

#### Natural Science

**CH104 Introductory Chemistry**

*Hours 4*

Three lectures and one three-hour laboratory. The course is primarily for students in the Capstone College of Nursing and the College of Human Environmental Sciences; it may not be substituted for CH 101 except with departmental permission. Degree credit is not awarded for both CH 104 and CH 107. An introductory survey of the facts, principles, and theories of chemistry. Usually offered in the fall and summer semesters.

#### Natural Science

**CH105 Introductory Org Chem**

*Hours 4*

Three lectures and one three-hour laboratory. Not open to chemistry majors or minors or to students who have earned credit for CH 102. Degree credit is not awarded for both CH 105 and CH 102 or both CH 105 and CH 108. The course may not be substituted for CH 101 or CH 102. Brief survey of organic and biochemistry. Usually offered in the spring and summer semesters.

Prerequisite(s): CH 104 or CH 101 or CH 117

#### Natural Science

**CH117 Honors General Chemistry**

*Hours 4*

Three lectures and one three-hour laboratory. Not open to students who have earned credit for CH 101. Degree credit is not awarded for both CH 117 and CH 101 or both CH 117 and CH 107. A comprehensive study of the fundamental facts, principles, and theories of general chemistry. Usually offered in the fall semester.

#### Natural Science, University Honors

**CH118 Honors General Chemistry**

*Hours 4*

Three lectures and one three-hour laboratory. Not open to students who have earned credit for CH 102. Degree credit is not awarded for both CH 118 and CH 102, both CH 118 and CH 105, or both CH 118 and CH 108. Continuation of CH 117 with basic inorganic chemistry. Includes a systematic study of the elements and of the structures, properties, and reactions of their compounds. Usually offered in the spring semester.

Prerequisite(s): CH 117

#### Natural Science, University Honors

**CH155 Forensic Science**

*Hours 3*

This course will present an overview of forensic science. The course will focus on processing a crime scene as well as other topics used to connect a suspect to a given crime.
Courses for Chemistry

CH223 Quantitative Analysis
Hours 4
Three lectures and one three hour laboratory. Comprehensive course covering classical methods of quantitative analysis as well as an introduction to electrochemical, spectroscopic and chromatographic methods. Usually offered in the fall, spring and summer semesters.
Prerequisite(s): CH 102 or CH 118

CH231 Elem Organic Chemistry I
Hours 3
Three lectures. The course is an introduction to the theory and principles of organic chemistry. Topics include organic structure, syntheses, and analyses. Usually offered in the fall, spring, and summer semesters.
Prerequisite(s): CH 231

CH232 Elem Organic Chem II
Hours 3
Three lectures. This course is a continuation of CH 231. Usually offered in the fall, spring, and summer semesters.
Prerequisite(s): CH 231

CH237 Elem Organic Chem Lab
Hours 2
A one-hour lecture and five-hour laboratory. Designed for chemistry majors and chemistry minors to take concurrently with CH 232. Usually offered in the fall, spring, and summer sessions.
Prerequisite(s): CH 231
Prerequisite(s) with concurrency: CH 232

CH331 Honors Organic Chemistry 1
UH
Hours 3
Honors Organic Chemistry will combine a modern in-depth insight into our chemical world with an evolutionary understanding of how the science of chemistry came to be what it is now, and how and where it influences our everyday lives. This course may better serve the interests of students majoring in Chemistry, Chemical Biology, Biological Sciences, Pharmacy, and Material and Engineering Sciences by the inclusion of traditional chemistry topics along with careful examination of the impact of chemistry on the world around us.
Prerequisite(s): CH 102 or 118

University Honors

CH332 Honors Organic Chemistry 2
UH
Hours 3
Honors Organic Chemistry will combine a modern in-depth insight into our chemical world with an evolutionary understanding of how the science of chemistry came to be what it is now, and how and where it influences our everyday lives. This course may better serve the interests of students majoring in Chemistry, Chemical Biology, Biological Sciences, Pharmacy, and Material and Engineering Sciences by the inclusion of traditional chemistry topics along with careful examination of the impact of chemistry on the world around us.
Prerequisite(s): CH 231 or CH 331

University Honors

CH338 Elem Organic Chem Lab II
W
Hours 2
A one-hour lecture and five-hour laboratory. The course is designed for chemistry majors. Usually offered in the fall semester. Writing proficiency within this discipline is required for a passing grade in this course.
Prerequisite(s): CH 232 and CH 237

Writing

CH340 Elem Physical Chem
Hours 3
Three lectures. This course is designed for students in the pre-health professional degree or pursuing the chemistry minor and is a study of the application of physical chemical concepts in biological systems. It is a.
Prerequisite(s): CH 223 and PH 102 or PH 106 or PH 126

CH341 Physical Chemistry
Hours 3
Three lectures. The course is designed for chemistry majors and is a study of the structure and properties of matter with emphasis on theoretical principles and their mathematical interpretation. Usually offered in the fall semester.
Prerequisite(s): CH 223 and MATH 227 or MATH 247
Prerequisite(s) with concurrency: PH 106 or PH 126

CH342 Physical Chemistry
Hours 3
Three lectures. The course is designed for chemistry majors. Continuation of CH 341. Usually offered in the spring semester.
Prerequisite(s): CH 341

CH343 Elem Phy Chem Lab
Hours 1
One three-hour laboratory. The course is designed to be taken concurrently with CH 340. Usually offered in the fall semester.
Prerequisite(s) with concurrency: CH 340

CH348 Physical Chemistry Lab
W
Hours 2
6 hours of laboratory. The course is designed to be taken concurrently with CH 342. Usually offered in the spring semester. Writing proficiency within this discipline is required for a passing grade in this course.
Prerequisite(s): CH 341
Prerequisite(s) with concurrency: CH 342

Writing

CH396 Undergrad Research
Hours 1-3
3 hours laboratory per credit hour. The student works on a research project under the direction of a chemistry faculty member. CH 396 is offered in the fall, CH 398 is offered in the spring, and CH 399 is offered in the summer.
CH398 Undergrad Research
Hours 1-3
No description available

CH399 Undergrad Research
Hours 1-3
3 hours laboratory per credit hour. The student works on a research project under the direction of a chemistry faculty member. CH 396 is offered in the fall, CH 398 is offered in the spring, and CH 399 is offered in the summer.

CH405 Medicinal Chemistry
Hours 3
Fundamental considerations in drug design. Includes lead discovery, target identification and validation, pharmacodynamics, pharmacokinetics and metabolism, and formulations/drug delivery systems. Chemical modifications to improve efficacy and pharmacokinetics will be emphasized.
Prerequisite(s): CH 232 and either CH 461, BSC 300, or BSC 450

CH409 Organometallic Chemistry
Hours 3
Survey of the typical reactions of organotransition metal complexes with a focus on the fundamental mechanisms of these reactions and the application of organometallic catalysts.
Prerequisite(s): CH 341 or CH 401 or CH 413

CH410 Scientific Glassblowing
Hours 3
The course introduces students to the fundamentals of scientific glassblowing through hands-on training. Usually offered during Interim.

CH413 Inorganic Chemistry
Hours 4
Three lectures and one three-hour laboratory. Survey in areas of coordination, main-group, and organometallic chemistry. Laboratory experiments involve the preparation, purification, and identification of inorganic compounds. Usually offered in the fall semester.
Prerequisite(s): CH 338 and CH 341

CH424 Instrumental Analysis
W
Hours 4
Two lectures and one five-hour laboratory. The course covers the general operating principles of the commonly used analytical instruments with an emphasis on theory. Wherever possible, mathematical interpretations and derivations are given. Usually offered in the spring semester. Writing proficiency within this discipline is required for a passing grade in this course.
Prerequisite(s): CH 223 and CH 341
Prerequisite(s) with concurrency: CH 348
Writing

CH432 Advanced Synthetic Organic Chemistry
Hours 3
This course will serve as a co-listed course with CH 532. The main goal of this course is to instruct advanced organic chemistry to undergraduates.
Prerequisite(s): CH 232

CH435 Inter Organic Chem
Hours 3
Three lectures. The course is designed to familiarize the student with mechanistic and synthetic organic chemistry. Usually offered in the fall semester.
Prerequisite(s): CH 232 and CH 342

CH437 Spectroscopic Techniques
Hours 3
This course is an introduction to the theory, application, and interpretation of four major types of structural analysis used by synthetic chemists: absorption, infrared, and nuclear magnetic resonance spectroscopy, as well as mass spectrometry. We will focus heavily on interpretation of spectra and application of these tools to address questions of structure and reactivity. While this is an organic chemistry class, examples of applications to organometallic and inorganic materials will also be presented.
Prerequisite(s): CH 232, 338, 342, and 348

CH461 Biochemistry I
Hours 3
Three lectures. Survey of the physical and chemical properties of the molecular components and methods of isolating and analyzing them. Usually offered in the fall semester.
Prerequisite(s): CH 223 and CH 232 and CH 237

CH462 Biochemistry II
Hours 3
Three lectures. Survey of the principal pathways of carbon, nitrogen, and energy metabolism and clinical and forensic chemistry. Usually offered in the spring semester.
Prerequisite(s): CH 461 or BSC 300

CH463 Biochem-Clin/Foren/Chem
W
Hours 3
One lecture and one six-hour laboratory. Biochemical techniques within the structure of a semester-long research project. Topics include protein purification and chromatography, spectroscopy, electrophoresis, kinetics, and DNA manipulation. Writing proficiency within this discipline is required for a passing grade in this course.
Prerequisite(s): CH 461
Prerequisite(s) with concurrency: CH 462
Writing
CH466 Bioorganic Chemistry
Hours 3
This course will be divided into two main areas. We will begin with methods for studying enzyme reaction mechanisms. This section will include steady-state enzyme kinetics, derivation of rate equations, enzyme inhibition, isotope exchange methods, pH and viscosity effects, kinetic isotope effects, and site-directed mutagenesis. We will then utilize these methods in order to investigate the chemical mechanisms enzymes use to catalyze specific reactions (hydrolysis; group transfer; 1,1 hydrogen shift; 1,2 hydrogen shift; C-C bond formations; and redox chemistry). We will also cover the chemistry associated with several cofactors required by enzymes (flavins, thiamin pyrophosphate, tetrahydrofolate, etc).
Prerequisite(s): CH 461

CH473 The Study of Oenology
Hours 3
The course will focus on the complex chemical substances and chemical transformations responsible for the flavor, aroma, texture, & color variations in wine. Oenology exposes students to the process of making wine from growing grapes used in wine-making to fermentation of fruit sugars through yeast growth and accompanying chemical transformations.
Prerequisite(s): CH 232 and CH 338

CH491 Honors Research Sem
UH
Hours 1
The course is designed for students in the Chemistry Department Honors Program. CH 491 and CH 493 are offered in the fall semester; CH 492 and CH 494 are offered in the spring semester.
University Honors

CH492 Honors Research Sem
UH
Hours 1
The course is designed for students in the Chemistry Department Honors Program. CH 491 and CH 493 are offered in the fall semester; CH 492 and CH 494 are offered in the spring semester.
University Honors

CH493 Honors Research Sem
UH
Hours 1
The course is designed for students in the Chemistry Department Honors Program. CH 491 and CH 493 are offered in the fall semester; CH 492 and CH 494 are offered in the spring semester.
University Honors

CH494 Honors Research Sem
UH
Hours 1
The course is designed for students in the Chemistry Department Honors Program. CH 491 and CH 493 are offered in the fall semester; CH 492 and CH 494 are offered in the spring semester.
University Honors

CH497 Intro To Research
Hours 1-3
Three hours laboratory per credit hour. The student works on a research project under the direction of a chemistry faculty member. A final research report is required. CH 497 is offered in the fall; CH 498 is offered in the spring; and CH 499 is offered in the summer.
Prerequisite(s): CH 232 and CH 338 and CH 348 and CH 342

CH498 Intro To Research
Hours 1-3
Three hours laboratory per credit hour. The student works on a research project under the direction of a chemistry faculty member. A final research report is required. CH 497 is offered in the fall; CH 498 is offered in the spring; and CH 499 is offered in the summer.
Prerequisite(s): CH 232 and CH 338 and CH 342 and CH 348

CH499 Intro To Research
Hours 1-3
Three hours laboratory per credit hour. The student works on a research project under the direction of a chemistry faculty member. A final research report is required. CH 497 is offered in the fall; CH 498 is offered in the spring; and CH 499 is offered in the summer.
Prerequisite(s): CH 232 and CH 338 and CH 342 and CH 348