

# CHEMISTRY (CHEM)

## **CHEM 100 Chemistry & Society (3 Units)**

Qualitative introduction to chemistry using current world problems and commercial products, such as the ozone layer, nuclear fission, polymers and drugs, to introduce chemical principles. (Formerly 3150:100)

## **CHEM 101 Chemistry for Everyone (4 Units)**

Integrated, hands-on, laboratory instruction in the fundamental concepts of chemistry for general education and middle-level licensure for pre-service and in-service teachers. (Formerly 3150:101)

**Ohio Transfer 36:** Yes

**Gen Ed:** Natural Science with Lab

## **CHEM 110 Introduction to General, Organic & Biochemistry I (Lecture) (3 Units)**

Sequential. Introduction to principles of chemistry, fundamentals of inorganic, organic and biochemistry. Structure and chemistry of carbohydrates, lipids, proteins; biochemistry of enzymes, metabolism, radiation. (Formerly 3150:110)

**Ohio Transfer 36:** Yes

## **CHEM 111 Introduction to General, Organic & Biochemistry I (Laboratory) (1 Unit)**

Prerequisite/Corequisite: CHEM 110. Sequential. Laboratory course applying principles of chemistry and fundamentals of inorganic, organic and biochemistry. (Formerly 3150:111)

**Ohio Transfer 36:** Yes

## **CHEM 112 Introduction to General, Organic & Biochemistry II (Lecture) (3 Units)**

Prerequisite: CHEM 110. Sequential. Introduction to principles of chemistry, fundamentals of inorganic, organic and biochemistry. Structure and chemistry of carbohydrates, lipids, proteins; biochemistry of enzymes, metabolism, radiation. (Formerly 3150:112)

**Ohio Transfer 36:** Yes

## **CHEM 113 Introduction to General, Organic & Biochemistry II (Laboratory) (1 Unit)**

Prerequisite/Corequisite: CHEM 112. Sequential. Laboratory course applying principles of chemistry and fundamentals of inorganic, organic and biochemistry. (Formerly 3150:113)

**Ohio Transfer 36:** Yes

**Gen Ed:** Natural Science with Lab

## **CHEM 114 Introduction to General, Organic & Biochemistry (Lecture) (4 Units)**

Prerequisite: If a student has no high school chemistry, CHEM:101 is recommended to be taken prior to enrollment in CHEM:114. Introduction to principles of chemistry, fundamentals of inorganic, organic and biochemistry. Structure and chemistry of carbohydrates, lipids, proteins; biochemistry of enzymes, metabolism, radiation. (Formerly 3150:114)

## **CHEM 115 Introduction to General, Organic & Biochemistry (Laboratory) (1 Unit)**

Pre/Corequisite: CHEM 114. Laboratory course applying principles of chemistry and fundamentals of inorganic, organic and biochemistry. (Formerly 3150:115)

## **CHEM 151 Principles of Chemistry I (3 Units)**

Prerequisite: placement in MATH 149 or MATH 154 or permission. Introduction to basic facts and principles of chemistry including atomic and molecular structure, states of matter and thermodynamics. For chemistry majors, pre-medical students and most other science majors. Discussion (day sections). (Formerly 3150:151)

**Ohio Transfer 36:** Yes

**Gen Ed:** Natural Science

## **CHEM 152 Principles of Chemistry I Laboratory (1 Unit)**

Pre/Corequisite: CHEM 151. Laboratory course applying principles of thermodynamics, chemical analysis and laboratory practice. (Formerly 3150:152)

**Ohio Transfer 36:** Yes

**Gen Ed:** Natural Science with Lab

## **CHEM 153 Principles of Chemistry II (3 Units)**

Pre/Corequisite: CHEM 151. Continuation of 151, 152, including aqueous solution theory, chemical kinetics, equilibrium, electrochemistry and nuclear chemistry. For chemistry majors, premedical students and most other science majors. Discussion (day sections). (Formerly 3150:153)

**Ohio Transfer 36:** Yes

**Gen Ed:** Natural Science

## **CHEM 154 Qualitative Analysis (2 Units)**

Prerequisite: CHEM 152; pre/corequisite: CHEM 153. Laboratory course applying principles of chemical equilibrium to inorganic qualitative analysis. (Formerly 3150:154)

## **CHEM 199 Introductory Seminar in Chemistry (1 Unit)**

Basic concepts in chemistry practice including written and oral communication skills, computer skills, professional ethics, environmental issues, chemical literature, degree options, and career considerations. (Formerly 3150:199)

## **CHEM 263 Organic Chemistry Lecture I (3 Units)**

Sequential. Prerequisite: CHEM 153 or permission. Structure and reactions of organic compounds, mechanism of reactions. (Formerly 3150:263)

## **CHEM 264 Organic Chemistry Lecture II (3 Units)**

Sequential. Prerequisite: CHEM 263 or permission. Structure and reactions of organic compounds, mechanism of reactions. (Formerly 3150:264)

## **CHEM 265 Organic Chemistry Laboratory I (2 Units)**

Sequential. Prerequisite: CHEM 154; pre/corequisite: CHEM 263. Laboratory experiments to develop techniques in organic chemistry and illustrate principles. Discussion. (Formerly 3150:265)

## **CHEM 266 Organic Chemistry Laboratory II (2 Units)**

Prerequisite: CHEM 265. Pre/Corequisite: CHEM 264. Sequential. Laboratory experiments to develop techniques in organic chemistry and illustrate principles. Discussion. (Formerly 3150:266)

## **CHEM 305 Physical Chemistry for the Biological Sciences (4 Units)**

Prerequisites: CHEM 264, MATH 222, and [PHYS 262 or PHYS 292]. Chemical thermodynamics, kinetics, molecular structure and spectra. Accepted for the BS degree in Biochemistry. (Formerly 3150:305)

## **CHEM 313 Physical Chemistry Lecture I (3 Units)**

Prerequisites: CHEM 264, MATH 223, and PHYS 291. Gases, thermodynamics, thermochemistry, solutions, dilute solutions, chemical equilibrium, phase rule, chemical kinetics, electrochemistry, electrolytic equilibria. (Formerly 3150:313)

**CHEM 314 Physical Chemistry Lecture II (3 Units)**

Prerequisites: CHEM 264, and MATH 335, and PHYS 292. Atomic and molecular structure and spectroscopy. (Formerly 3150:314)

**CHEM 370 Biochemistry Laboratory (2 Units)**

Prerequisite: CHEM 266. An integrated laboratory experience covering the isolation, characterization and analysis of enzymes and DNA, protein synthesis and purification, enzyme kinetics, biochemical databases and statistical treatment of data. (Formerly 3150:370)

**CHEM 380 Advanced Chemistry Laboratory I (2 Units)**

Prerequisite: CHEM 266. A laboratory experience that focuses on the synthetic and spectroscopic techniques of modern inorganic chemistry, including bio-inorganic and organometallic compounds. (Formerly 3150:380)

**CHEM 381 Advanced Chemistry Laboratory II (2 Units)**

Prerequisite CHEM 266. Corequisite: CHEM 314 or CHEM 305 or permission. Integrated laboratory experience covering the areas of quantitative analysis, physical chemistry, and instrumental techniques. (Formerly 3150:381)

**CHEM 399 Internship in Chemistry (1-3 Units)**

Prerequisites: minimum GPA of 2.5; permission of the Department. Work experience focused on career applications of the discipline of Chemistry. (May repeat for a maximum of six credits.) (Formerly 3150:399)

**CHEM 401 Biochemistry Lecture I (3 Units)**

Prerequisite: CHEM 264. Biochemistry of amino acids, carbohydrates, lipids, and nucleic acids: structure/function relations. Enzymes as catalysts: kinetics and regulation. Cofactors. (Formerly 3150:401)

**CHEM 402 Biochemistry Lecture II (3 Units)**

Prerequisite: CHEM 401. Overview of metabolism; thermodynamics; carbohydrate, fatty acid, amino acid, and nucleoside anabolism and catabolism; hormonal control of metabolism. Photosynthesis. (Formerly 3150:402)

**CHEM 406 Biochemistry of Gene Expression (3 Units)**

Prerequisites: BIOL 311 and CHEM 401. DNA, RNA, and protein synthesis, translation and transcription. Gene function and expression, cell cycle and cancer, genetic engineering, gene silencing, gain of function studies. (Formerly 3150:406)

**CHEM 410 Special Readings in Analytical Chemistry (1-3 Units)**

Prerequisite: Junior standing or higher. Selected topics in advanced analytical chemistry for which no course exists. (May be repeated) (Formerly 3150:410)

**CHEM 411 Special Readings in Inorganic Chemistry (1-3 Units)**

Prerequisite: Junior standing or higher. Selected topics in advanced inorganic chemistry for which no course exists. (May be repeated) (Formerly 3150:411)

**CHEM 412 Special Readings in Organic Chemistry (1-3 Units)**

Prerequisite: Junior or greater standing. Selected topics in advanced organic chemistry for which no course exists. (May be repeated) (Formerly 3150:412)

**CHEM 413 Special Readings in Physical Chemistry (1-3 Units)**

Prerequisite: Junior or greater standing. Selected topics in advanced physical chemistry for which no course exists. (May be repeated) (Formerly 3150:413)

**CHEM 415 Special Readings in Biochemistry (1-3 Units)**

Prerequisite: Junior or greater standing. Selected topics in advanced biochemistry for which no course exists. (May be repeated) (Formerly 3150:415)

**CHEM 423 Analytical Chemistry I (3 Units)**

Prerequisite: CHEM 154 and CHEM 263. Theoretical principles of quantitative and instrumental analysis. (Formerly 3150:423)

**CHEM 424 Analytical Chemistry II (3 Units)**

Prerequisite: CHEM 154 and CHEM 263. Instrumental analysis with emphasis on newer analytical tools and methods. (Formerly 3150:424)

**CHEM 463 Advanced Organic Chemistry (3 Units)**

Prerequisite: CHEM 264. Introduction to study of mechanisms of organic reactions. (Formerly 3150:463)

**CHEM 472 Advanced Inorganic Chemistry (3 Units)**

Prerequisites: CHEM 314 or CHEM 305. Concepts of atomic structure integrated in systematic classification of elements. Periodic table. Chemistry of the representative elements. Transition elements including coordination compounds, organometallics and metal carbonyls. (Formerly 3150:472)

**CHEM 480 Advanced Chemistry Laboratory III (2 Units)**

Prerequisite: CHEM 381; or Corequisite: CHEM 305; or permission. Integrated laboratory experience covering the areas of quantitative analysis, physical chemistry, instrumental techniques, and inorganic chemistry. (Formerly 3150:480)

**CHEM 490 Workshop in Chemistry (1-3 Units)**

(May be repeated) Group studies of special topics in chemistry. May not be used to meet undergraduate or graduate major requirements in chemistry. (Formerly 3150:490)

**CHEM 497 Honors Project in Chemistry (2 Units)**

(May be repeated for a total of eight credits) Prerequisites: Junior or senior standing in Honors College and permission of department honors preceptor. Independent research leading to completion of honors thesis under guidance of honors project adviser. (Formerly 3150:497)

**CHEM 498 Special Topics in Chemistry (1-3 Units)**

Special Topics in Chemistry. (Formerly 3150:498)

**CHEM 499 Research Problems in Chemistry (1-2 Units)**

(May be repeated for a total of eight credits) Prerequisite: Permission. Assignment of special problems to student, designed as an introduction to research problems. (Formerly 3150:499)