ECU COURSE CATALOG

2025-2026 CHEMISTRY COURSES

CHEM-1114 General Chemistry I 4 Credits
THIS COURSE DEALS WITH SOME OF THE FUNDAMENTAL LAWS, THEORIES, DEFINITIONS, AND ORGANIZING SCHEMES RELATING TO MATTER AND ENERGY AND THE CHANGES THAT TAKE PLACE IN THEM. IT IS A BROAD OVERVIEW OF THE PRINCIPLES OF CHEMISTRY AND CHEMICAL REACTIVITY. PREVIOUS EXPOSURE TO CHEMISTRY IS NOT ASSUMED. THREE HOURS LECTURE AND TWO HOURS LAB WEEKLY. Required Previous: Must remediate science deficiency by completing PHSCI-0123 or passing placement test.

CHEM-1114L General Chemistry I Laboratory 0 Credits
LAB COURSE FOR CHEM-1114.

CHEM-1214 General Chemistry II 4 Credits
A CONTINUATION OF 1114. SOLUTION CHEMISTRY, ACIDS AND BASES, ELECTROCHEMISTRY, OXIDATION-REDUCTION AND MOLECULAR AND IONIC EQUILIBRIA. THE LABORATORY WILL INCLUDE AN INTRODUCTION TO QUALITATIVE ANALYSIS. THREE HOURS LECTURE AND 3 HOURS LAB WEEKLY. Required Previous: CHEM-1114

CHEM-1214L General Chemistry II Laboratory 0 Credits
LAB COURSE FOR CHEM-1214.

CHEM-1314 General Organic and Biochemistry 4 Credits
THREE HOURS OF LECTURE AND TWO HOURS OF LAB PER WEEK. A CONTINUATION OF 1114 FOR STUDENTS WHOSE MAJORS DO NOT REQUIRE OTHER CHEMISTRY COURSES. WILL COMPLETE A THOROUGH, BUT ROUNDED, FOUNDATION IN INTRODUCTORY CHEMISTRY THROUGH FOCUS ON SELECTED TOPICS IN INORGANIC, ORGANIC, AND BIOCHEMISTRY. Required Previous: CHEM-1114

CHEM-1314L General Organic and Biochemistry Laboratory 0 Credits
LAB COURSE FOR CHEM-1314.

CHEM-1324 Chemical Principles 4 Credits
AN INTRODUCTION TO GENERAL, ORGANIC AND BIOLOGICAL CHEMISTRY FOR ALLIED HEALTH MAJORS WITH THREE HOURS OF LECTURE AND TWO HOURS OF LAB PER WEEK. THIS COURSE COVERS SELECTED TOPICS IN GENERAL CHEMISTRY, ORGANIC CHEMISTRY, AND BIOLOGICAL CHEMISTRY. TOPICS COVERED IN LECTURE AND LAB INCLUDE MEASUREMENTS, ATOMIC STRUCTURE, BONDING, KINETICS, ACIDS/BASES, GASES, NOMENCLATURE, STATES OF MATTER, SOLUTIONS, STOICHIOMETRY AND REACTIONS, OXIDATION-REDUCTION, HYDROCARBONS, FUNCTIONAL GROUPS, CARBOHYDRATES, Required Previous: Must remediate science deficiency by completing PHSCI-0123 or passing placement test.

CHEM-1324L Chemical Principles Laboratory 0 Credits
LAB COURSE FOR CHEM-1324.

CHEM-2881 Special Studies in Chemistry (Subject named in title listing) 1 Credit
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-2882 Special Studies in Chemistry (Subject named in title listing) 2 Credits
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-2883 Special Studies in Chemistry (Subject named in title listing) 3 Credits
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-2884 Special Studies in Chemistry (Subject named in title listing) 4 Credits
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-3114 Organic Chemistry I 4 Credits
THEORY INCLUDES STRUCTURE, NOMENCLATURE, PHYSICAL PROPERTIES, AND REACTION MECHANISMS PERTINENT TO THE CHEMISTRY OF HYDROCARBONS OF BOTH THE ALIPHATIC AND AROMATIC SERIES. LAB WORK PROVIDES AN INTRODUCTION TO SYNTHESES AND REACTIONS OF HYDROCARBONS INCLUDING COMMON PURIFICATION TECHNIQUES. PROPER RECORD KEEPING OF EXPERIMENTAL WORK ALSO IS STRESSED. FOUR HOURS LECTURE AND 3 HOURS LAB WEEKLY. Required Previous: CHEM-1214

CHEM-3114L Organic Chemistry I Laboratory 0 Credits
LAB COURSE FOR CHEM-3114.

CHEM-3124 Chemistry of Food 4 Credits
OVERVIEW OF THE CHEMICAL, PHYSICAL AND BIOLOGICAL PROPERTIES OF FOOD COMPONENTS WITH LAB EMPHASIZING CHEMICAL, PHYSICAL AND BIOLOGICAL CHANGES IN FOODS DURING PROCESSING AND STORAGE. Required Previous: CHEM-3114.

CHEM-3214 Quantitative Analysis I 4 Credits
A COURSE IN THE GRAVIMETRIC AND VOLUMETRIC ANALYSIS WITH EMPHASIS ON CHEMICAL EQUILIBRIUM, CALCULATIONS, SEPARATION TECHNIQUES, AND ANALYSIS OF COMPLEX SUBSTANCES. THREE LECTURE AND THREE LAB HOURS WEEKLY. Required Previous: CHEM-1214

CHEM-3214L Quantitative Analysis I Laboratory 0 Credits
LAB COURSE FOR CHEM-3214.

CHEM-3314 Quantitative Analysis II 4 Credits
CONTINUATION OF 3214. Required Previous: CHEM-3214

CHEM-3484 Instrumental Analysis 4 Credits
A STUDY OF EMISSION AND ABSORPTION SPECTROPHOTOMETRY, SEPARATION TECHNIQUES, AND ELECTRICAL ANALYTICAL METHODS. LABORATORY DETERMINATIONS WILL BE PERFORMED USING ATOMIC ABSORPTION, GAS CHROMATOGRAPHY, MASS SPECTROMETRY, IR, UV, AND VISIBLE SPECTROPHOTOMETRY, FLAME EMISSION, AND OTHER MODERN METHODS OF ANALYSIS. TWO HOURS LECTURE AND 4 HOURS LABORATORY WEEKLY. FORMAL LABORATORY REPORTS WILL BE REQUIRED. Required Previous: CHEM-3214

CHEM-3484L Instrumental Analysis Laboratory 0 Credits
LAB COURSE FOR CHEM-3484.

CHEM-4114 Organic Chemistry II 4 Credits
STRUCTURE, NOMENCLATURE, PHYSICAL PROPERTIES, AND REACTION MECHANISMS PERTINENT TO THE CHEMISTRY OF HYDROCARBON DERIVATIVES (ALKYLHALIDES, ALCOHOLS, ALDEHYDES, KETONES, CARBOXYLIC ACIDS, AMINES, ETC.) ARE COVERED. LAB WORK INCLUDES SYNTHESES, PURIFICATION, IDENTIFICATION (STRESS ON I.R. SPECTROSCOPY), AND LAB RECORD KEEPING. THREE HOURS LECTURE AND 3 HOURS LAB WEEKLY. Required Previous: CHEM-3114

CHEM-4114L Organic Chemistry II Laboratory 0 Credits
LAB COURSE FOR CHEM-4114.

CHEM-4213 Biochemistry 3 Credits
AN INTRODUCTION TO THE CHEMISTRY OF LIVING SYSTEMS. THE STRUCTURE, NOMENCLATURE, AND CHEMICAL PROPERTIES OF THE MAJOR GROUPS OF BIOMOLECULES (CARBOHYDRATES, LIPIDS, PROTEINS, NUCLEIC ACIDS) ARE COVERED. THE BIOCHEMICAL NATURE OF ENZYMES, COENZYMES, HORMONES, AND SELECTED METABOLIC PATHWAYS ALSO ARE PRESENTED. Required Previous: CHEM-3114

CHEM-4221 Biochemistry Laboratory 1 Credit
THREE HOURS OF LAB PER WEEK. TECHNIQUES (CHROMATOGRAPHY, ELECTROPHORESIS, SPECTROSCOPY, ETC.) FOR THE PREPARATION, IDENTIFICATION, AND QUANTIFICATION OF REPRESENTATIVE BIOMOLECULES ARE COVERED. ATTENTION ALSO IS GIVEN TO THE PROPERTIES OF ENZYMES AND TO THE KINETICS OF ENZYME CATALYZED REACTIONS. Required Previous or Concurrent: CHEM-4213

CHEM-4312 Teachers' Course in Chemistry 2 Credits
PROBLEMS AND METHODS IN THE TEACHING OF CHEMISTRY.

CHEM-4413 Advanced Inorganic Chemistry 3 Credits
A STUDY OF PERIODIC ARRANGEMENT OF THE ELEMENTS, THE CHEMISTRY OF THE REPRESENTATIVE AND TRANSITION ELEMENTS, AND ASPECTS OF THEORETICAL INORGANIC CHEMISTRY INCLUDING CHEMICAL BONDING, MOLECULAR SYMMETRY, COORDINATION CHEMISTRY, ACID-BASE CONCEPTS, AND ORGANOMETALLIC COMPOUNDS. THREE HOURS OF LECTURE WEEKLY. Required Previous: CHEM-1214

CHEM-4421 Advanced Inorganic Chemistry Laboratory 1 Credit
THREE HOURS OF LABORATORY PER WEEK. TECHNIQUES (SOLID-STATE SYNTHESIS, X-RAY DIFFRACTOMETRY, FOURIER TRANSFORM INFRARED SPECTROSCOPY, INCLUDING DIFFUSE REFLECTANCE SPECTROSCOPY, ETC.) FOR THE SYNTHESIS, IDENTIFICATION, AND CHARACTERIZATION OF REPRESENTATIVE INORGANIC COMPOUNDS ARE COVERED. Required Previous or Concurrent: CHEM-4413

CHEM-4514 Physical Chemistry I 4 Credits
A FUNDAMENTAL COURSE IN THE PRINCIPLES AND APPLICATIONS OF PHYSICAL CHEMISTRY, INCLUDING THE GAS LAWS, THERMODYNAMICS, THERMOCHEMISTRY, SOLUTION CHEMISTRY, PHASE EQUILIBRIA, CHEMICAL EQUILIBRIUM, KINETICS, AND ELECTROCHEMISTRY. THREE HOURS LECTURE AND 4 HOURS LABORATORY WEEKLY. Required Previous: MATH-2825

CHEM-4514L Physical Chemistry Laboratory 0 Credits
LAB COURSE FOR CHEM-4514.

CHEM-4523 Advanced Biochemistry 3 Credits
A CONTINUATION OF 4213, THE METABOLIC PATHWAYS OF THE MAJOR GROUPS OF BIOMOLECULES INCLUDING THE SYNTHESIS OF LIPIDS (FATTY ACIDS AND HORMONES AND VITAMINS), PROTEINS (AND AMINO ACIDS), AND NUCLEIC ACIDS WILL BE DISCUSSED. PHOTOSYNTHESIS AND AN EMPHASIS ON HOW THESE PROCESSES ARE CONTROLLED AND INTEGRATED THROUGHOUT THE CELL WILL ALSO BE PRESENTED. Required Previous: CHEM-4114

CHEM-4531 Advanced Biochemistry Laboratory 1 Credit
CURRENT TECHNIQUES IN THE PURIFICATION AND CHARACTERIZATION OF ENZYME TO DEMONSTRATE FUNDAMENTAL PRINCIPLES THAT ARE UTILIZED IN MODERN BIOCHEMISTRY AND MOLECULAR BIOLOGY RESEARCH LABORATORIES. PRACTICAL SKILLS TAUGHT INCLUDE MICRO PIPETTING, BASIC SOLUTION PREPARATION, CONDUCTING PH MEASUREMENTS, ISOLATING CRUDE ENZYME EXTRACTS, AND PERFORMING STANDARD ACTIVITY ASSAYS. PROBLEM-SOLVING METHODOLOGY IN BIOCHEMISTRY, DISCUSSION OF RECENT ADVANCES IN AREAS RELATED TO THE SUBJECT MATTER WILL ALSO BE Required Previous: CHEM-4114

CHEM-4614 Physical Chemistry II 4 Credits
A CONTINUATION OF 4514 EMPHASIZING QUANTUM THEORY, ATOMIC STRUCTURE, SYMMETRY, MOLECULAR SPECTROSCOPY, STATISTICAL MECHANICS, AND NUCLEAR CHEMISTRY. THREE HOURS LECTURE AND 4 HOURS LABORATORY WEEKLY. Required Previous: CHEM-4514

CHEM-4614L Physical Chemistry II Laboratory 0 Credits
LAB COURSE FOR CHEM-4614.

CHEM-4981 Seminar in Chemistry (Subject named in title listing) 1 Credit
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-4982 Seminar in Chemistry (Subject named in title listing) 2 Credits
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-4983 Seminar in Chemistry (Subject named in title listing) 3 Credits
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-4984 Seminar in Chemistry (Subject named in title listing) 4 Credits
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-4991 Individual Studies in Chemistry (Subject named in title listing) 1 Credit
DIRECTED INDIVIDUAL STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-4992 Individual Studies in Chemistry (Subject named in title listing) 2 Credits
DIRECTED INDIVIDUAL STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-4993 Individual Studies in Chemistry (Subject named in title listing) 3 Credits
DIRECTED INDIVIDUAL STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-4994 Individual Studies in Chemistry (Subject named in title listing) 4 Credits
DIRECTED INDIVIDUAL STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-5981 Seminar in Chemistry (Subject named in title listing) 1 Credit
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

CHEM-5982 Seminar in Chemistry (Subject named in title listing) 2 Credits
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

CHEM-5983 Seminar in Chemistry (Subject named in title listing) 3 Credits
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

CHEM-5984 Seminar in Chemistry (Subject named in title listing) 4 Credits
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

CHEM-5991 Individual Studies in Chemistry (Subject named in title listing) 1 Credit
DIRECTED INTENSIVE STUDY ON DEFINITE PROBLEM OR SPECIAL SUBJECT, BASED ON APPROVED OUTLINE OR PLAN, CONFERENCES, ORAL AND WRITTEN REPORTS. Required Previous: Twelve hours of Chemistry

CHEM-5992 Individual Studies in Chemistry (Subject named in title listing) 2 Credits
DIRECTED INTENSIVE STUDY ON DEFINITE PROBLEM OR SPECIAL SUBJECT, BASED ON APPROVED OUTLINE OR PLAN, CONFERENCES, ORAL AND WRITTEN REPORTS. Required Previous: Twelve hours of Chemistry

CHEM-5993 Individual Studies in Chemistry (Subject named in title listing) 3 Credits
DIRECTED INTENSIVE STUDY ON DEFINITE PROBLEM OR SPECIAL SUBJECT, BASED ON APPROVED OUTLINE OR PLAN, CONFERENCES, ORAL AND WRITTEN REPORTS. Required Previous: Twleve hours of Chemsitry

CHEM-5994 Individual Studies in Chemistry (Subject named in title listing) 4 Credits
DIRECTED INTENSIVE STUDY ON DEFINITE PROBLEM OR SPECIAL SUBJECT, BASED ON APPROVED OUTLINE OR PLAN, CONFERENCES, ORAL AND WRITTEN REPORTS. Required Previous: Twelve hours of Chemistry

CHEM-H1214 Honors-General Chemistry II 4 Credits
A CONTINUATION OF 1114. SOLUTION CHEMISTRY, ACIDS AND BASES, ELECTROCHEMISTRY, OXIDATION-REDUCTION AND MOLECULAR AND IONIC EQUILIBRIA. THE LABORATORY WILL INCLUDE AN INTRODUCTION TO QUALITATIVE ANALYSIS. THREE HOURS LECTURE AND 3 HOURS LAB WEEKLY. Required Previous: CHEM-1114

CHEM-H3114 Honors-Organic Chemistry I 4 Credits
THEORY INCLUDES STRUCTURE, NOMENCLATURE, PHYSICAL PROPERTIES, AND REACTION MECHANISMS PERTINENT TO THE CHEMISTRY OF HYDROCARBONS OF BOTH THE ALIPHATIC AND AROMATIC SERIES. LAB WORK PROVIDES AN INTRODUCTION TO SYNTHESES AND REACTIONS OF HYDROCARBONS INCLUDING COMMON PURIFICATION TECHNIQUES. PROPER RECORD KEEPING OF EXPERIMENTAL WORK ALSO IS STRESSED. FOUR HOURS LECTURE AND 3 HOURS LAB WEEKLY. Required Previous: CHEM-1214

CHEM-H3114L Honors-Organic Chemistry I Laboratory 0 Credits
LAB COURSE FOR CHEM-H3114.

CHEM-H3214 Honors-Quantitative Analysis I 4 Credits
A COURSE IN THE GRAVIMETRIC AND VOLUMETRIC ANALYSIS WITH EMPHASIS ON CHEMICAL EQUILIBRIUM, CALCULATIONS, SEPARATION TECHNIQUES AND ANALYSIS OF COMPLEX SUBSTANCES. THREE LECTURE AND THREE LAB HOURS WEEKLY. Required Previous: CHEM-1214

CHEM-H4114 Honors-Organic Chemistry II 4 Credits
STRUCTURE, NOMENCLATURE, PHYSICAL PROPERTIES, AND REACTION MECHANISMS PERTINENT TO THE CHEMISTRY OF HYDROCARBON DERIVATIVES (ALKYLHALIDES, ALCHOHOLS, ALDEHYDES, KETONES, CARBOXYLIC ACIDS, AMINES, ETC.) ARE COVERED. LAB WORK INCLUDES SYNTHESES, PURIFICATION, IDENTIFICATION (STRESS ON I.R. SPECTROSCOPY), AND LAB RECORD KEEPING. THREE HOURS LECTURE AND 3 HOURS LAB WEEKLY. Required Previous: CHEM-3114

CHEM-H4114L Honors-Organic Chemistry II Laboratory 0 Credits
LAB COURSE FOR CHEM-H4114.

CHEM-H4213 Honors-Biochemistry 3 Credits
AN INTRODUCTION TO THE CHEMISTRY OF LIVING SYSTEMS. THE STRUCTURE, NOMENCLATURE, AND CHEMICAL PROPERTIES OF THE MAJOR GROUPS OF BIOMOLECULES (CARBOHYDRATES, LIPIDS, PROTEINS, NUCLEIC ACIDS) ARE COVERED. THE BIOCHEMICAL NATURE OF ENZYMES, COENZYMES, HORMONES, AND SELECTED METABOLIC PATHWAYS ALSO ARE PRESENTED. Required Previous: CHEM-3114

CHEM-H4413 Honors-Advanced Inorganic Chemistry 3 Credits
A STUDY OF PERIODIC ARRANGEMENT OF THE ELEMENTS, THE CHEMISTRY OF THE REPRESENTATIVE AND TRANSITION ELEMENTS, AND ASPECTS OF THEORETICAL INORGANIC CHEMISTRY INCLUDING CHEMICAL BONDING, MOLECULAR SYMMETRY, COORDINATION CHEMISTRY, ACID-BASE CONCEPTS, AND ORGANOMETALLIC COMPOUNDS. THREE HOURS OF LECTURE WEEKLY. Required Previous: CHEM-1214

CHEM-H4514 Honors-Physical Chemistry I 4 Credits
A FUNDAMENTAL COURSE IN THE PRINCIPLES AND APPLICATIONS OF PHYSICAL CHEMISTRY, INCLUDING THE GAS LAWS, THERMODYNAMICS, THERMOCHEMISTRY, SOLUTION CHEMISTRY, PHASE EQUILIBRIA, CHEMICAL EQUILIBRIUM, KINETICS, AND ELECTROCHEMISTRY. THREE HOURS LECTURE AND 4 HOURS LABORATORY WEEKLY. Required Previous: CHEM-1214

CHEM-H4993 Honors-Individual Studies in Chemistry (Subject named in title listing) 3 Credits
DIRECTED INDIVIDUAL STUDY ON SPECIAL SUBJECT OR PROBLEM.

CHEM-S5981 Seminar in Chemistry (Subject named in title listing) 1 Credit
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

CHEM-S5982 Seminar in Chemistry (Subject named in title listing) 2 Credits
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

CHEM-S5983 Seminar in Chemistry (Subject named in title listing) 3 Credits
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.