

Chemistry (CHEM)

CHEM 113 Chemistry for Today (3). A non-mathematical approach to chemistry for non-science majors; chemistry of the real world and its role in modern technology and its effect on quality of life. CHEM 113L is not required. (F, S)

CHEM 113L Chemistry for Today Laboratory (1) (Optional). Hands-on experience with common chemicals. Designed with science education component. If students withdraw from CHEM 113 lecture, they must withdraw from the lab. (F, S)

CHEM 151 General Chemistry I (3). Basic laws and principles of chemistry, part I: metric units, scientific notation, periodic table, gas laws, chemical equations, thermodynamics, atomic and molecular structure, and bonding. Students withdrawing from this course must receive instructor's permission to retain CHEM 151L. Prerequisite: MATH 119 or two years high school algebra recommended. Concurrent enrollment: CHEM 151L. (F)

CHEM 151H General Chemistry I Honors Seminar (1). Special projects and advanced concepts in General Chemistry I. Prerequisite: qualifying score on chemistry placement examination or consent of instructor. Concurrent enrollment: CHEM 151. (F)

CHEM 151L General Chemistry I Laboratory (1). Basic general chemical laboratory techniques. Students withdrawing from CHEM 151 may retain this course only with instructor's permission. Concurrent enrollment: CHEM 151. (F)

CHEM 152 General Chemistry II (3). Basic laws and principles of chemistry, part II: liquids, solids, solutions, reaction rates and mechanisms, equilibrium, acids and bases, oxidation/reduction and advanced topics. Students withdrawing from this course must receive instructor's permission to retain CHEM 152L. Prerequisites: CHEM 151/151L. Concurrent enrollment: CHEM 152L. (S, SU)

CHEM 152H General Chemistry II Honors Seminar (1). Special projects and advanced concepts in General Chemistry II. Prerequisites: Completion of CHEM 151/151H with final grades of "A" or "B" or consent of instructor. Concurrent enrollment: CHEM 152. (S)

CHEM 152L General Chemistry II Laboratory (1). Laboratory techniques in chemical principles and phenomena. Students withdrawing from CHEM 152 may retain this course only with instructor's permission. Concurrent enrollment: CHEM 152. (S, SU)

CHEM 233 Quantitative Analysis (3). Error analysis, acid-base titrations, gravimetry, redox titrations, complexometric titrations, visible spectroscopy, atomic spectroscopy, etc.; theory and methods. Prerequisites: CHEM 152/152L. Concurrent enrollment: CHEM 233L. (S)

CHEM 233L Quantitative Analysis Laboratory (1). Techniques and approaches to quantitative chemical analysis. Prerequisites: CHEM 152/152L. Concurrent enrollment: CHEM 233. (S)

CHEM 251 Integrated Organic and Biochemistry (3). Chemistry of carbon compounds, functional groups, biomolecules, macromolecules, energy and material metabolism, molecular genetics and diseases, and biotechnology. This course is designed for students needing a one-semester survey of these fields and may not be used to satisfy chemistry major or minor requirements. Prerequisites: CHEM 151/151L or equivalent. Concurrent enrollment: CHEM 251L. (S)

CHEM 251L Integrated Organic and Biochemistry Laboratory (1). Basic techniques in beginning organic and biochemistry, including properties and reactions of common organic and biological compounds. May not be used to satisfy chemistry major or minor requirements. Three hours laboratory per week. Prerequisites: CHEM 151/151L or equivalent. Concurrent enrollment: CHEM 251. (S)

CHEM 268 Workshop in Chemistry (1-3). As announced. (May be repeated for maximum of 4 hours credit.)

CHEM 293 Topics in Chemistry (1-3). As announced. (May be repeated for credit if topics are different.)

CHEM 321 Inorganic Chemistry (3). Nomenclature, theory, structural, spectroscopic, chemical and physical properties of inorganic substances. Prerequisites: CHEM 233/233L. Concurrent enrollment: CHEM 321L. (F)

CHEM 321L Inorganic Chemistry Laboratory (1). Inorganic synthesis and analysis. Three hours laboratory per week. Prerequisites: CHEM 233/233L. Concurrent enrollment: CHEM 321. (F)

CHEM 341 Organic Chemistry I (3). Hybrid orbitals, chemical bonds, chemistry of alkanes, alkenes, alkynes, optical activity, and introduction to spectroscopy (IR, MS). Credits from CHEM 251 may not be used to satisfy chemistry major or minor requirements. Prerequisites: CHEM 152/152L. Concurrent enrollment: CHEM 341L. (F)

CHEM 341L Organic Chemistry I Laboratory (1). Three laboratory hours per week. Credit from CHEM 251L may not be used to satisfy chemistry major or minor requirements. Concurrent enrollment: CHEM 341. (F)

CHEM 342 Organic Chemistry II (3). Aromaticity, electrophilic substitution, NMR and UV spectroscopy, organometallics, alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids, amines, dicarbonyl compounds, carbohydrates, amino acids and proteins. Credit from CHEM 251, may not be used to satisfy chemistry major or minor requirements. Prerequisites: CHEM 341/341L. Concurrent enrollment: CHEM 342L. (S)

CHEM 342L Organic Chemistry II Laboratory (1). Three laboratory hours per week. Credit from CHEM 251L, may not be used to satisfy chemistry major or minor requirements. Prerequisites: CHEM 341/341L. Concurrent enrollment: CHEM 342. (S)

CHEM 401 Biochemical Methods (1). An integrated biochemical analysis laboratory covering dialysis, centrifugation, ultracentrifugation, electrophoresis, isoelectric focusing, gel filtration, ion-exchange chromatography. Prerequisite: CHEM 452 or equivalent or concurrent enrollment in CHEM 452. Concurrent enrollment: CHEM 401L. (S)

CHEM 401L Biochemical Methods Laboratory (1). Prerequisite: CHEM 452. Concurrent enrollment: CHEM 401. (S)

CHEM/PHYS 411 Physical Chemistry/Thermodynamics (3). Thermodynamic and an introduction to statistical mechanics and kinetics, applications to atomic and molecular systems. Prerequisites: CHEM 152; PHYS 201 OR 151 and MATH 132. Recommended: PHYS 202, MATH 202, and CHEM 233/L. (F)

CHEM 411L Physical Chemistry Laboratory I (1). Prerequisite CHEM 411 or concurrently enrollment. (F)

CHEM 412 Physical Chemistry/Quantum Mechanics (3). An introduction to quantum mechanics and spectroscopy with applications to atomic and molecular systems. Prerequisites: MATH 202 and PHYS 201 or 151. Recommended: PHYS 202. (S)

CHEM 412L Physical Chemistry Laboratory II (1). Prerequisites: CHEM 411/L and CHEM 412 or concurrent enrollment in CHEM 412 or consent of instructor. (S)

- CHEM 422 Advanced Inorganic Chemistry (3).** Physical chemistry principles applicable to inorganic systems. Prerequisites: CHEM 412/412L. (S)
- CHEM 439 Teaching in Chemistry (1).** Methods, resources, safety and lesson plans in teaching chemistry lecture and laboratory. Prerequisites: CHEM 151/151L, 152/152L; senior standing with major or minor in science; consent of instructor. Open only to students working toward teaching licensure. Concurrent enrollment: GEOL 439; PHYS 439. (F)
- CHEM 442 Advanced Organic Chemistry (3).** Survey of reactions and techniques of modern organic syntheses (pharmaceuticals and natural products) including methods of characterization and use of the chemical literature. Prerequisites: CHEM 342/342L. (Alt F)
- CHEM 450 Instrumental Analysis (4).** Survey of advanced analytical techniques and analytical method development, focusing on hands-on training with modern instruments in spectroscopy, separation, and electroanalytical techniques. Prerequisites: CHEM 233/233L, 342/342L. (F)
- CHEM 452 Biochemistry (3).** The chemistry and metabolism of biomolecules. Recommended for all chemistry majors, pre-med and students interested in molecular biology. Not a continuation of CHEM 251. Prerequisites: CHEM 342/342L, 412/412L. (F)
- CHEM 453 Advanced Biochemistry (3).** A study of metabolic pathways including, biosynthesis and degradation of cellular components, biosynthesis of secondary metabolites, and degradation of xenobiotic materials. Prerequisites: CHEM 452 or equivalent. (S)
- CHEM/GEOL 454 Geochemistry (3).**
- CHEM 466 Molecular Modeling and Informatics (3).** Principles of "data mining," molecular modeling (algorithms, software), visualization of chemical information and use of high-speed computer systems for computation of the dynamics and properties of complex materials. Prerequisites: CHEM 412/412L. (Alt S)
- CHEM 468 Workshop in Chemistry (1-3).** As announced. (May be repeated for a maximum of 6 hours.)
- CHEM 470 Investigative Problems (1-4).** Independent study or research of some chemical problems. Three hours laboratory weekly per credit hour. Three credit hours required of all professional chemistry majors. Student must pre-arrange project with instructor before enrollment. (May be repeated for a maximum of 4 hours.) Prerequisite: consent of instructor. (F, S)
- CHEM/ANTH/BIOL/GEOL/PHYS 475 Scanning Electron Microscopy (2).**
- CHEM 491 Directed Study (1-3).** Independent study. (May be repeated for a maximum of 4 hours.)
- CHEM 492 Undergraduate Seminar (1).** Selected topics in chemistry to be presented by students: literature search, techniques in development and presentation of topics. Students are required to attend other seminars. (May be repeated for a maximum of 2 hours.) (F, S)
- CHEM 493 Topics in Chemistry (1-3).** As announced (May be repeated for credit if topics are different.)
- CHEM 495 Senior Chemistry Review (1).** Comprehensive, integrated capstone review of chemical concepts and assessment of student competence. Required for all chemistry majors. Prerequisite: senior standing in Plan I or Plan II chemistry degree program. (S or U) (F, S)

Communication (COMM)

- COMM 101 Interpersonal Communication (3).** Development of communication skills necessary for effective interaction with persons on an interpersonal level and in small groups; theoretical dimensions of interpersonal communication; provides opportunities for practical application. Concurrent enrollment: COMM 101L.
- COMM 101L Interpersonal Communication Laboratory (NC).** Concurrent enrollment: COMM 101.
- COMM 102 Public Speaking (3).** Training in composition of informative and persuasive discourse with emphasis on the use of evidence, reasoning, delivery skills and audience analysis.
- COMM 103 Introduction to Mass Communication (3).** General history and current trends in mass media; various types of mass media, investigation of opportunities and requirements of the industries.
- COMM 110 Beginning Television Production (3).** Introduction to the principles and techniques of studio production for television. This includes producing, directing, camera, lighting, switching, sound and graphic design. Course covers the technical and creative aspects of the television production process. Concurrent enrollment: COMM 110L.
- COMM 110L Beginning Television Production Laboratory (NC).** Concurrent enrollment: COMM 110.
- COMM 202 Dynamics of Group Behavior (3).** Principles and practices of effective participation in small group discussions, with emphasis on improvement of critical thinking, problem solving, organization skills and group cooperation methods.
- COMM 203 News Writing (3).** Principles of writing news and feature stories (computer assisted). Prerequisites: ENG 102; COMM 103. Concurrent enrollment: COMM 203L.
- COMM 203L News Writing Laboratory (NC).** Concurrent enrollment: COMM 203.
- COMM 210 Audio Production (3).** Basic orientation of principles and techniques of radio and television audio production equipment. Course includes technical and creative use of microphones, mixing consoles, music, sound effects and recorders for radio, television and film sound tracks. Concurrent enrollment: COMM 210L.
- COMM 210L Audio Production Laboratory (NC).** Concurrent enrollment: COMM 210.
- COMM 212 Introduction to Digital Photography (3).** Basics of digital photography to be used in media covered. Topics include: camera operation, software application, framing, news value and legal and ethical considerations.
- COMM 220 Intermediate Television Production (3).** Emphasis on electronic field production (EFP/ENG) and post-production editing. Principles and techniques of single-camera field production for television including camera, lenses, lighting and directing. Editing sequence includes continuity editing for informational and dramatic television forms. Lab fee required. Prerequisite: COMM 110/110L. Concurrent enrollment: COMM 220L.
- COMM 220L Intermediate Television Production Laboratory (NC).** Concurrent enrollment: COMM 220.
- COMM 223 Voice and Performance (3).** Techniques of broadcast announcing, voice development, microphone techniques and practical experience with various materials in broadcast situations.
- COMM 231 Argumentation Theory (3).** Logical analysis and discourse with an emphasis on argumentative structure and organization focusing on value and policy propositions.