

CHEM 1135. Engineering Chemistry Laboratory.

This laboratory course is designed to accompany CHEM 1335. This course introduces students to experimental measurements and the study of thermodynamics, kinetics, and equilibria. Corequisite: CHEM 1335 with a grade of "C" or better.

1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 1109

CHEM 1141. General Chemistry Laboratory I.

First of two laboratory courses in general chemistry for science-related majors. Course introduces the students to the basics of experimental measurements, including density, separation techniques, formula determinations, titrations, thermodynamics, gas laws, and descriptive chemistry. Corequisite: CHEM 1310 or CHEM 1341 either with a grade of "D" or better.

1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 1111

CHEM 1142. General Chemistry Laboratory II.

Second of two laboratory courses in general chemistry. Laboratory techniques are emphasized, and applied to both qualitative and quantitative analysis. Prerequisites: CHEM 1141 and CHEM 1341 both with grades of "D" or better. Corequisite: CHEM 1342 with a grade of "D" or better.

1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 1112

CHEM 1310. Introductory Chemistry for Non-Science Majors.

A one semester principles course for students in non-science related majors, this course covers the major concepts of chemistry and the role of chemistry in contemporary society. (It is not intended as an introductory course for general chemistry or for science majors.).

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 1305

CHEM 1330. Chemistry for Non-Science Majors.

This is the second of two lecture courses for non-science majors. The course surveys organic and biochemistry and current topics which may include energy-related topics, nuclear chemistry, environmental chemistry, medicinal chemistry, and synthetic and natural polymers. Prerequisite: CHEM 1310 or CHEM 1341 either with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 1307

CHEM 1335. Engineering Chemistry.

Engineering-related applications form the core of this one-semester lecture course. Topics include stoichiometry, gases, chemical bonding and structure, periodic trends, materials, energy, kinetics, equilibrium, electrochemistry, and nuclear chemistry. Prerequisite: [MATH 1315 or MATH 1317 or MATH 1319 or MATH 1329 or MATH 2321 or MATH 2417 or MATH 2471 any with a grade of "C" or better] or [ACT Mathematics score of 24 or better] or [SAT Mathematics score of 550 or better] or [Accuplacer College Mathematics score of 86 or better] or [Compass College Algebra score of 46 or better] or [Next-Generation Advanced Algebra and Functions Test of 263 or better].

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 1309

CHEM 1341. General Chemistry I.

This initial lecture course in general chemistry for science-related majors covers atomic and molecular structure, bonding, states of matter, solutions, and descriptive chemistry. Prerequisites: [MATH 1315 or MATH 1317 or MATH 1319 or MATH 1329 or MATH 2321 or MATH 2417 or MATH 2471 any with a grade of "C" or better] or [ACT Mathematics score of 24 or better] or [SAT Mathematics score of 550 or better] or [Accuplacer College Mathematics score of 86 or better] or [Compass College Algebra score of 46 or better] or [Next-Generation Advanced Algebra and Functions Test of 263 or better].

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 1311

CHEM 1342. General Chemistry II.

Second of two lecture courses in general chemistry for science-related majors, covering equilibrium processes, acid-base chemistry, and kinetics, and electrochemistry. A basic knowledge of algebra is needed. Prerequisite: CHEM 1341 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Life & Phys Sciences Core 030|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 1312

CHEM 2130. Laboratory Technique in Organic Chemistry.

An optional laboratory to accompany CHEM 2330, covers experimental techniques of preparation, purification, and determination of physical and chemical properties of organic compounds. Prerequisites: CHEM 1142 and CHEM 1342 both with grades of "D" or better. Corequisite: CHEM 2330 with a grade of "D" or better.

1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 2141. Organic Chemistry Laboratory I.

This laboratory introduces the student to the general techniques of organic chemistry. Prerequisites: CHEM 1342 with a grade of "C" or better and CHEM 1142 with a grade of "D" or better. Corequisite: CHEM 2341 with a grade of "D" or better.

1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 2123

CHEM 2142. Organic Chemistry Laboratory II.

This laboratory involves the study of typical organic reactions. Prerequisites: CHEM 2341 with a grade of "C" or better and CHEM 2141 with a grade of "D" or better. Corequisite: CHEM 2342 with a grade of "D" or better.

1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 2125

CHEM 2150. Biochemistry & Metabolism Lab.

An optional laboratory to accompany CHEM 2350. This laboratory examines the physical properties and chemistry of carbohydrates, amino acids, proteins, lipids and nucleotides. Course is designed for students majoring in nutrition, clinical laboratory science and agriculture. Prerequisites: [CHEM 2130 and CHEM 2330] or [CHEM 2142 and CHEM 2342] any with a grade of "D" or better. Corequisites: CHEM 2350 with a grade of "D" or better.

1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 2330. Fundamentals of Organic Chemistry.

A one-semester course which covers nomenclature, structure and reactions of organic compounds with an introduction to bioorganic molecules. Course is designed for students majoring in nutrition, clinical laboratory sciences and agriculture. Prerequisites: CHEM 1142 and CHEM 1342 both with grades of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 2341. Organic Chemistry I.

This course covers the nomenclature, reactions and reaction mechanisms of the hydrocarbons and the alkyl halides. Prerequisites: CHEM 1342 with a grade of "C" or better. Corequisite: CHEM 1142 with a grade of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 2323

CHEM 2342. Organic Chemistry II.

This course covers the nomenclature, reactions and reaction mechanisms of the major functional groups. Prerequisite: CHEM 2341 with a grade of "C" or better. Corequisite: CHEM 2141 with a grade of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

TCCN: CHEM 2325

CHEM 2350. Biochemistry & Metabolism.

A one-semester study of carbohydrate, proteins, lipids and nucleotides which presents both structure and intermediary metabolism along with an introduction to the function of enzymes and coenzymes.

Course is designed for students majoring in nutrition, clinical laboratory science and agriculture. Prerequisites: [CHEM 2130 and CHEM 2330] or [CHEM 2142 and CHEM 2342] any with a grade of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 3190. Cooperative Education.

This course provides cooperative education students the opportunity to study particular problems in chemistry and biochemistry in an occupational setting. Problems are related to the student's work assignment, culminating in an industrial supervisor's evaluation and the student's technical report or presentation. A total of 3 hours of cooperative education credit may be applied to the student's major elective. Prerequisite: Minimum 2.25 Overall GPA and Instructor Approval.

1 Credit Hour. 0 Lecture Contact Hours. 40 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 3245. Physical Chemistry Laboratory.

Experiments illustrating principles and methods of physical chemistry are performed. Written reports on the experiments are prepared. (WI) Prerequisites: CHEM 3330 with a grade of "C" or better and CHEM 3410 with a grade of "D" or better. Corequisites: CHEM 3340 with a grade of "D" or better.

2 Credit Hours. 1 Lecture Contact Hour. 4 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Lab Required|Writing Intensive

Grade Mode: Standard Letter

CHEM 3276. Experimental Biochemistry.

Course introduces biochemistry minors to the fundamental techniques used in modern biochemistry. Experiments use the essential techniques employed in the study of proteins, enzymes and nucleic acids with emphasis on the use of modern instrumentation and the manipulation and analysis of experimental data. Prerequisites: CHEM 3375 or CHEM 4375 either with a grade of "C" or better.

2 Credit Hours. 1 Lecture Contact Hour. 4 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Lab Required

Grade Mode: Standard Letter

CHEM 3290. Advanced Cooperative Education.

This course provides cooperative education students the opportunity to study particular problems in chemistry and biochemistry in an occupational setting. Problems are related to the student's work assignment, culminating in an industrial supervisor's evaluation and the student's technical report or presentation. A total of 3 hours of cooperative education credit may be applied to the student's major elective. Prerequisite: Minimum 2.25 Overall GPA and instructor approval.

2 Credit Hours. 0 Lecture Contact Hours. 40 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 3330. Physical Chemistry I.

The course covers principles of thermodynamics and thermochemistry, phase equilibria, electrochemistry and elementary kinetics including rate laws and mechanisms. Prerequisites: CHEM 1142 with a grade of "D" or better and CHEM 1342 and MATH 2472 both with grades of "C" or better.

3 Credit Hours. 4 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 3340. Physical Chemistry II.

The course covers kinetics, quantum mechanics, spectroscopy, and other selected topics. Prerequisites: CHEM 3330 and MATH 2472 and PHYS 2425 all with grades of "C" or better.

3 Credit Hours. 4 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 3341. Descriptive Inorganic Chemistry.

An analysis of atomic, molecular, and solid state bonding and structure with an emphasis on coordination compounds and bioinorganic chemistry. Representative compounds and reactions of the elements will be surveyed. Prerequisite: CHEM 2342 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 3375. Principles of Biochemistry.

Course provides biochemistry majors and minors with a rigorous introduction to biochemistry. Topics include the chemical function and structure of proteins, nucleic acids, lipids and carbohydrates; enzyme mechanisms, kinetics and regulation. Prerequisites: CHEM 2342 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 3380. Analytical Biochemistry.

This course is designed to acquaint the student with the chemical and physical principles of modern biochemical methods. Emphasis is placed upon the application of the methods to current problems in biochemistry and molecular biology and the interpretation of data. Prerequisite: CHEM 3375 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 3381. Biochemistry Techniques.

Course introduces biochemistry majors to techniques in analytical and physical biochemistry. Experiments reinforce fundamental concepts and utilize modern instrumentation. Experimental design, interpretation of results, and data reporting will be emphasized. (WI) Prerequisites: CHEM 3375 with a grade of "C" or better. Corequisite: CHEM 3380 with a grade of "C" or better.

3 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Writing Intensive

Grade Mode: Standard Letter

CHEM 3390. Physical Chemistry for Biochemists.

A study of the theories and laws of physical chemistry as it relates to biochemistry. The topics covered include ideal and real gases, classical thermodynamics, reaction kinetics, phase equilibria, electrochemistry, quantum mechanics, spectroscopy and statistical mechanics. Prerequisite: MATH 2472 with a grade of "C" or better. Corequisite: PHYS 1430 with a grade of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 3410. Quantitative Analysis.

Course covers the general theory and practice of typical methods of gravimetric and volumetric analysis, satisfies the quantitative analysis requirements for chemistry majors, minors, pre-medical and pharmacy students. Prerequisites: CHEM 1342 with a grade of "C" or better and CHEM 1142 with a grade of "D" or better.

4 Credit Hours. 3 Lecture Contact Hours. 6 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Lab Required

Grade Mode: Standard Letter

CHEM 4231. Advanced Laboratory I.

An advanced integrated lab illustrating a variety of chemical techniques for the preparation, characterization and analysis of organic and inorganic materials. (WI) Prerequisites: CHEM 3245 and CHEM 3340 and CHEM 3410 all with grades of "D" or better. Corequisites: CHEM 4331 with a grade of "D" or better.

2 Credit Hours. 1 Lecture Contact Hour. 4 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Lab Required|Writing Intensive

Grade Mode: Standard Letter

CHEM 4241. Advanced Laboratory II.

An advanced integrated lab illustrating a variety of chemical techniques for the preparation, characterization and analysis of inorganic and organic materials. (WI) Prerequisites: CHEM 4231 and CHEM 4331 both with grades of "D" or better. Corequisite: CHEM 4341 with a grade of "D" or better.

2 Credit Hours. 1 Lecture Contact Hour. 4 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Lab Required|Writing Intensive

Grade Mode: Standard Letter

CHEM 4295. Laboratory Development and Practice.

This course develops the laboratory instructional abilities of students seeking either 8-12 Chemistry or 8-12 Physical Science Teaching Certification. Topics include both traditional laboratory techniques and guided inquiry techniques, safety, laboratory management, pedagogical theory and practical knowledge of laboratory experiments. Prerequisite: Minimum 2.5 Overall GPA.

2 Credit Hours. 1 Lecture Contact Hour. 2 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Lab Required

Grade Mode: Standard Letter

CHEM 4299. Undergraduate Research.

This course is available to undergraduate chemistry or biochemistry majors only. It may be repeated for credit but a maximum of four semester hours from this course are applicable toward advanced chemistry electives. Prerequisite: Instructor approval.

2 Credit Hours. 0 Lecture Contact Hours. 4 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering|Lab Required

Grade Mode: Standard Letter

CHEM 4310. Medicinal Chemistry.

This course surveys modern approaches to drug discovery and mechanisms of drug action with the focus on molecular structures of drugs. Examples of drug discovery for the chemotherapy of cancer, microbial and cardiovascular diseases will be examined. Prerequisites: [CHEM 2342 and CHEM 2350] or CHEM 3375 or CHEM 4375 any with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4312. Organometallic Chemistry.

This course will survey the structure, bonding, and reactivity of organometallic complexes. Homogeneous catalysis of the transition metals as well as the main group elements along with specialized "seminal research papers" in the field of organometallic chemistry will also be presented. Prerequisites: CHEM 2342 and CHEM 3341 both with grades of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4331. Instrumental Analysis.

The theory and methodology associated with the quantitative analysis of materials, i.e., electronics, spectroscopy, electrochemistry and chromatography are presented. Prerequisite: CHEM 3340 with a grade of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4333. Spectroscopy.

The study of various spectrometric techniques in qualitative and structural analysis of chemical substances. Prerequisite: CHEM 2342 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4341. Advanced Inorganic Chemistry.

This course will use group theory analysis to predict vibrational spectra and bonding in molecules, including metal complexes. Numerous approaches (acid/base, redox, etc.) will be employed to rationalize the products of inorganic and organometallic reactions. The materials properties of solids and nanomaterials will also be discussed. Prerequisites: CHEM 3340 and CHEM 3341 both with grades of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4350. Modern Molecular Modeling.

A study of the application of computational techniques to molecular modeling. Topics covered include quantum mechanical modeling, forcefield based molecular modeling, molecular energy minimization, molecular dynamics, vibrational spectra, solution of crystalline structures, diffraction patterns, molecular blends, phase equilibria, crystal morphology, physical property prediction and mesoscale modeling. Prerequisite: CHEM 3340 with a grade of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4351. Introduction to Polymers.

This course is designed to develop the student's general understanding of polymer history and importance as well as terminology, structure, and synthesis. The overall scope of the course will be to develop the student's general knowledge of polymer synthesis and structure. Prerequisite: CHEM 2342 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4360. Molecular Biology.

This course provides Biochemistry majors and minors with advanced knowledge of the field of molecular biochemistry. Topics include gene expression (transcription and translation of genes in bacteria and higher organisms), post-translational modification of proteins, chromosomal DNA replication, cell cycle checkpoint controls, DNA damage and repair, as well as theories of cancer and aging. Prerequisite: CHEM 3375 or CHEM 4375 either with a grade of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4371. Directed Study.

Independent study on a particular subject area in chemistry or biochemistry. The specific study area, resource material, goals, and achievements will be approved by the instructor. Prerequisites: CHEM 2342 with a grade of "C" or better and instructor approval.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4375. Biochemistry.

Course provides Chemistry majors and minors with an overview of biochemistry topics. Topics include a description of the structure and function of proteins, enzymes, nucleic acids, lipids and carbohydrates. Students may not receive credit for both CHEM 3375 and CHEM 4375. Prerequisites: CHEM 2342 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4382. Advanced Biochemistry Research Laboratory II.

This course is the second of two laboratory courses providing instruction in the modern techniques of biochemistry. Students will perform independent research projects involving isolation, manipulation and characterization of biomolecules. Results of these experiments and the scientific literature investigations will be used to prepare formal written reports and oral presentations. Prerequisite: CHEM 4481 with a grade of "C" or better. (WI).

3 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Writing Intensive

Grade Mode: Standard Letter

CHEM 4385. Metabolism.

A study of the biodegradation and biosynthesis of carbohydrates, lipids, amino acids, proteins, and nucleic acids. Prerequisite: CHEM 3375 or CHEM 4375 either with a grade of "D" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering

Grade Mode: Standard Letter

CHEM 4390. Supramolecular Chemistry.

This course is designed to be a survey of the nature of non-covalent interactions between host and guest species. Emphasis will be focused on the rational design of hosts, thermodynamic and kinetic parameters involved in binding and the applications of various binding/recognition phenomena. Prerequisite: CHEM 2342 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Writing Intensive

Grade Mode: Standard Letter

CHEM 4481. Advanced Biochemistry Lab I.

The first of two laboratory courses providing instruction in the modern techniques of biochemistry. Experiments are performed on the isolation, manipulation and characterization of DNA, RNA and proteins. Students will prepare formal written reports and oral presentations. (WI) Prerequisites: CHEM 3381 with a grade of "C" or better and CHEM 3380 with a grade of "D" or better.

4 Credit Hours. 2 Lecture Contact Hours. 8 Lab Contact Hours.

Course Attribute(s): Dif Tui- Science & Engineering|Lab Required|Writing Intensive

Grade Mode: Standard Letter

CHEM 5110. Seminar in Chemistry.

A course designed to acquaint the graduate student with current research areas in chemistry. May be repeated twice for total of 3 semester hour credit.

1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5195. Professional Development of Graduate Assistants.

This course is designed to develop and enhance graduate assistants' laboratory instruction abilities. Topics covered in the course include effective lecture techniques, laboratory safety, theory and practical knowledge on laboratory experiments and laboratory section management. This course does not earn graduate credit.

1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.

Course Attribute(s): Graduate Assistantship|Exclude from Graduate GPA

Grade Mode: Leveling/Assistantships

CHEM 5199B. Thesis.

This course represents a student's continuing thesis enrollment. The student continues to enroll in this course until the thesis is submitted for binding.

1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.

Grade Mode: Credit/No Credit

CHEM 5285. Laboratory Development Practice.

This course develops the laboratory instructional abilities of post-baccalaureate students seeking either 8-12 Chemistry or 8-12 Physical Science Teaching Certification. Topics include both traditional laboratory techniques and guided inquiry techniques, safety, laboratory management, pedagogical theory and practical knowledge of laboratory experiments.

2 Credit Hours. 1 Lecture Contact Hour. 2 Lab Contact Hours.

Course Attribute(s): Lab Required

Grade Mode: Standard Letter

CHEM 5295. Professional Development of Graduate Assistants.

This course is designed to develop and enhance graduate assistants' laboratory instruction abilities. Topics covered in the course include effective lecture techniques, laboratory safety, theory and practical knowledge on laboratory experiments and laboratory section management. This course does not earn graduate credit.

2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Graduate Assistantship|Exclude from Graduate GPA

Grade Mode: Leveling/Assistantships

CHEM 5299B. Thesis.

This course represents a student's continuing thesis enrollment. The student continues to enroll in this course until the thesis is submitted for binding.

2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Credit/No Credit

CHEM 5310. Medicinal Chemistry.

This course surveys modern approaches to drug discovery and mechanisms of drug action with the focus on molecular structures of drugs. Examples of drug discovery for the chemotherapy of cancer, microbial and cardiovascular diseases will be examined.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5312. Organometallic Chemistry.

This course will survey the structure, bonding, and reactivity of organometallic complexes. Homogeneous catalysis of the transition metals as well as the main group elements along with specialized "seminal research papers" in the field of organometallic chemistry will also be presented.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5313. Principles and Applications of Mass Spectrometry.

This course is designed for graduate chemistry and biochemistry majors. Sections of the course are devoted to the theory and practice of mass spectrometry. Application to chemistry, biochemistry, biology and materials science will be explored.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5320. Modern Molecular Modeling.

The application of computational techniques to molecular modeling. Topics covered include quantum mechanical modeling, force field based molecular modeling, energy minimization, molecular dynamics, vibrational spectra, solution of crystalline structures, diffraction patterns, molecular blends, phase equilibria, crystal morphology, physical property prediction, and mesoscale modeling. Prerequisites: CHEM 3340 with a grade of "D" or better or instructor approval.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5321. Advanced Organic Chemistry.

Study of the relation of the following topics to structure and reactions of organic compounds: bonding, stereochemistry, acid-base concepts, physical organic chemistry, reactive species, and mechanisms.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5330. Physical Chemistry.

Fundamentals of physical chemistry are surveyed, emphasizing application in the other chemical sub-disciplines. Topics include classical thermodynamics, kinetics, atomic structure, and molecular spectroscopy.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5333. Spectroscopy.

Study of various spectrometric techniques in qualitative and structural analysis of chemical substances. Students who have completed CHEM 4333 or its equivalent may not take this course for master's credit.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5341. Inorganic Chemistry.

This course will review essential concepts in inorganic chemistry including atomic structure, bonding theory, acid-base chemistry, solid state structures, and coordination chemistry. Analytical techniques for characterizing inorganic structures will be discussed along with current topics in the field.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5351. Introduction to Polymers and Polymer Synthesis.

This course is designed to develop the student's general understanding of polymer history and importance as well as terminology, structure, and synthesis. The overall scope of the course will be to develop the student's general knowledge of polymer synthesis and structure. Students who have completed CHEM 4351 or its equivalent may not take this course for master's credit.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5353. Polymer Processing and Characterization.

This course is designed to explore the areas of polymer processing and characterization. Students will be introduced to extrusion, injection molding, film formation, thermoforming, thermal-mechanical measurements, classical mechanical testing, thermal-optical measurements, and methods for determination of polymer molecular weight. Prerequisites: CHEM 5351 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5355. Physical Chemistry of Polymers.

A study of the physical chemistry of polymers. Subjects covered include thermodynamics, kinetic polymerization, phase relationships, molecular geometry, spectroscopy of polymers, polymer physics and mechanical behavior, polymer blends, rheology, and polymer composites.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5365. Separation Methods in Chemical Analysis.

The principles of gas chromatography, capillary electrophoresis, and mass spectrometry are discussed with a balance among theory, practice, and application.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5370. Problems in Chemistry.

Open to graduate students on an individual basis by arrangement with the faculty member concerned. May be repeated once with different emphasis for additional credit.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5375. Biochemistry.

A course devoted to a study of the chemistry of carbohydrates, lipids, proteins, enzymes, and nucleic acids. A study of enzyme kinetics and thermodynamics of coupled reactions is included.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5381. Physical Biochemistry.

An introduction to the physical techniques of biochemistry with emphasis on the interpretation of experimental data obtained from electrophoresis, chromatography, immunological methods, ultracentrifugation, spectroscopy and emerging techniques.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5382. Enzymology.

A study of the chemical and physical properties of enzymes. Topics will include structure-function relationships, elucidation of chemical and kinetic mechanisms, and the role of enzymes in metabolism.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5383. Molecular Biology & Molecular Genetics.

This course addresses the basic genetic mechanisms of bacteria and eukaryotes and introduces some examples of the biochemical and genetic techniques employed to study cells, tissues, and organisms.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5384. Current Topics in Biochemistry and Molecular Biology.

Course provides students with advanced knowledge in the areas of biochemistry and molecular biology. Topics include signal transduction and the molecular biology of cancer, as well as emerging topics in Genomics, Proteomics, and other new developments in biochemistry. May be repeated once for credit. Prerequisites: CHEM 5381 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing

Grade Mode: Standard Letter

CHEM 5385. Metabolism.

A study of biodegradation and biosynthesis of carbohydrates, lipids, amino acids, proteins, and nucleic acids. Students who have completed CHEM 4385 or its equivalent may not take this course for master's credit.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5386. Proteins.

This course will cover advanced biochemistry topics related to proteins. Topics will include protein structure, structure-function relationships, and current methodologies for examining proteins in addition to current findings in primary literature.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5387. Nucleic Acids Chemistry.

This course will cover advanced biochemistry topics related to nucleic acids. Topics will include nucleic acid structures and properties, catalytic nucleic acids, protein-nucleic acid interactions, higher order complexes of protein-nucleic acids, and current methodologies for examining nucleic acids in addition to current findings in primary literature. Prerequisite: CHEM 5383 with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5390. Supramolecular Chemistry.

This course is designed to be a survey of the nature of non-covalent interactions between host and guest species. Emphasis will be focused on the rational design of hosts, thermodynamic and kinetic parameters involved in binding and the applications of various binding/recognition phenomena.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

CHEM 5395. Fundamentals of Research.

Course is designed to acquaint the beginning graduate student with materials and methods of chemical research. (MULT & MULP).

3 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Multicultural Perspective|Multicultural Content

Grade Mode: Standard Letter

CHEM 5399A. Thesis.

This course represents a student's initial thesis enrollment. No thesis credit is awarded until student has completed the thesis in CHEM 5399B.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Credit/No Credit

CHEM 5399B. Thesis.

This course represents a student's continuing thesis enrollment. The student continues to enroll in this course until the thesis is submitted for binding.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Credit/No Credit

CHEM 5599B. Thesis.

This course represents a student's continuing thesis enrollment. The student continues to enroll in this course until the thesis is submitted for binding.

5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Credit/No Credit

CHEM 5999B. Thesis.

This course represents a student's continuing thesis enrollment. The student continues to enroll in this course until the thesis is submitted for binding. Graded on a credit (CR), progress (PR), no-credit (F) basis.

9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Credit/No Credit

CHEM 7330. Environmental Chemistry.

An introduction to environmental chemistry, with an emphasis on aquatic resources. Basic principles of geochemistry and atmospheric chemistry, as they relate to pollutant impacts on aquatic ecosystems, also will be examined. Prerequisites: CHEM 2142 and CHEM 2342 and CHEM 3410 all with grades of "C" or better or instructor approval.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter