Chemistry (CHEM)

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. Prerequisite or Co-requisite: CHEM 1341, CHEM 1335, or CHEM 1310.
Grade Mode: Standard Letter
TCCN: CHEM 1111
about General Chemistry Laboratory I
1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

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 1341 and CHEM 1141. Prerequisite or Co-requisite: CHEM 1342.
about General Chemistry Laboratory II
1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 1112
about General Chemistry Laboratory II

CHEM 1310. Introductory Chemistry for Non-Science Majors.
A one semester principles course for students in non-science related majors. Course covers the major concepts of chemistry and the role of chemistry in contemporary society. Students will not receive credit for both CHEM 1310 and CHEM 1341.
about Introductory Chemistry for Non-Science Majors
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Life & Physical Sciences Core
Grade Mode: Standard Letter
TCCN: CHEM 1305
about Introductory Chemistry for Non-Science Majors

CHEM 1335. Engineering Chemistry.
This one semester lecture course is tailored to engineering students. Topics include stoichiometry, gases, chemical bonding and structure, periodic trends, materials, energy, kinetics, equilibrium, electrochemistry and nuclear chemistry. Course is a stand-alone course and does not serve as a prerequisite to any courses currently requiring CHEM 1341 as a prerequisite. Restricted to Engineering and Engineering Technology majors. Prerequisite: MATH 1315 with a grade of C or higher, ACT Mathematics score of 24 or more, SAT Mathematics score of 520 or more, Accuplacer College Mathematics score of 86 or more, or Compass College Algebra score of 46 or more.
about Engineering Chemistry
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Engineering Chemistry

CHEM 1341. General Chemistry I.
Initial lecture course in general chemistry for science-related majors, covering atomic and molecular structure, bonding, states of matter, solutions, and descriptive chemistry. Students will not receive credit for both CHEM 1310 and CHEM 1341. Concurrent registration in CHEM 1141 is recommended. Prerequisite: MATH 1315 with a grade of C or higher, ACT Mathematics score of 24 or more, SAT Mathematics score of 520 or more, Accuplacer College Mathematics score of 86 or more, or Compass College Algebra score of 46 or more.
Grade Mode: Standard Letter
TCCN: CHEM 1311
about General Chemistry I
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Life & Physical Sciences Core
Grade Mode: Standard Letter
TCCN: CHEM 1312
about General Chemistry II

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. Concurrent enrollment in CHEM 1142 is recommended. Prerequisite: CHEM 1341 with a grade of “C” or higher.
about General Chemistry II
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Life & Physical Sciences Core
Grade Mode: Standard Letter
TCCN: CHEM 1313
about General Chemistry II

CHEM 1403. Chemistry for Non-Science Majors.
A one semester course which surveys organic and biochemistry and may include petro-chemistry, nuclear chemistry, synthetic and natural polymers. Prerequisite: CHEM 1310 or CHEM 1341.
about Chemistry for Non-Science Majors
4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Life & Physical Sciences Core|Lab Required
Grade Mode: Standard Letter
TCCN: CHEM 1407
about Chemistry for Non-Science Majors

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 1342 and CHEM 1142. Co-requisite: CHEM 2330.
about Laboratory Technique in Organic Chemistry
1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
about Laboratory Technique in Organic Chemistry

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 higher, CHEM 1142. Prerequisite or Co-requisite: CHEM 2341.
about Organic Chemistry Laboratory I
1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2123
about Organic Chemistry Laboratory I
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 higher. Pre- or Co-requisite: CHEM 1142. 
about Organic Chemistry I
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2323
about Organic Chemistry I

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 higher. Prerequisite or Co-requisite: CHEM 2141. 
about Organic Chemistry II
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2325
about Organic Chemistry II

CHEM 2343. Organic Chemistry III.
This course covers the naming, reactions and reaction mechanisms of the major functional groups. Prerequisite: CHEM 2342 with a grade of “C” or higher. Prerequisite or Co-requisite: CHEM 2142. 
about Organic Chemistry III
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2326
about Organic Chemistry III

CHEM 2344. Organic Chemistry IV.
This course covers the naming, reactions and reaction mechanisms of the major functional groups. Prerequisite: CHEM 2343 with a grade of “C” or higher. Prerequisite or Co-requisite: CHEM 2143. 
about Organic Chemistry IV
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2327
about Organic Chemistry IV

CHEM 2345. Organic Chemistry V.
This course covers the naming, reactions and reaction mechanisms of the major functional groups. Prerequisite: CHEM 2344 with a grade of “C” or higher. Prerequisite or Co-requisite: CHEM 2144. 
about Organic Chemistry V
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2328
about Organic Chemistry V

CHEM 2346. Organic Chemistry VI.
This course covers the naming, reactions and reaction mechanisms of the major functional groups. Prerequisite: CHEM 2345 with a grade of “C” or higher. Prerequisite or Co-requisite: CHEM 2145. 
about Organic Chemistry VI
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2329
about Organic Chemistry VI

CHEM 2347. Organic Chemistry VII.
This course covers the naming, reactions and reaction mechanisms of the major functional groups. Prerequisite: CHEM 2346 with a grade of “C” or higher. Prerequisite or Co-requisite: CHEM 2146. 
about Organic Chemistry VII
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2330
about Organic Chemistry VII

CHEM 2348. Organic Chemistry VIII.
This course covers the naming, reactions and reaction mechanisms of the major functional groups. Prerequisite: CHEM 2347 with a grade of “C” or higher. Prerequisite or Co-requisite: CHEM 2147. 
about Organic Chemistry VIII
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2331
about Organic Chemistry VIII

CHEM 2349. Organic Chemistry IX.
This course covers the naming, reactions and reaction mechanisms of the major functional groups. Prerequisite: CHEM 2348 with a grade of “C” or higher. Prerequisite or Co-requisite: CHEM 2148. 
about Organic Chemistry IX
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2332
about Organic Chemistry IX

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 2330/CHEM 2130 or CHEM 2342/ CHEM 2142. 
about Biochemistry & Metabolism
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 2125
about Biochemistry & Metabolism Lab

CHEM 3245. Physical Chemistry Laboratory.
Experiments illustrating principles and methods of physical chemistry are performed. Written reports on the experiments are prepared. Prerequisites: CHEM 3330 with a “C” or better, and CHEM 3410. Prerequisite or Co-requisite: CHEM 3340. (WI). 
about Physical Chemistry Laboratory
2 Credit Hours. 1 Lecture Contact Hour. 4 Lab Contact Hours.
Course Attribute(s): Lab Required|Writing Intensive
Grade Mode: Standard Letter
TCCN: CHEM 2350
about Physical Chemistry I

CHEM 3275. Biochemical 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. Prior completion or concurrent enrollment in BIO 2400 is strongly recommended. Prerequisites: CHEM 3375 with a grade of “C” or higher. Co-requisite: CHEM 3380. (WI). 
about Biochemical Techniques
2 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.
Course Attribute(s): Lab Required|Writing Intensive
Grade Mode: Standard Letter
TCCN: CHEM 2376
about Experimental Biochemistry

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 with a grade of “C” or higher. 
about Experimental Biochemistry
2 Credit Hours. 1 Lecture Contact Hour. 4 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
TCCN: CHEM 2375
about Biochemical Techniques

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; CHEM 1342 and MATH 2472 with a grade of “C” or higher. 
about Physical Chemistry I
3 Credit Hours. 4 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
TCCN: CHEM 3325
about Physical Chemistry I
CHEM 3340. Physical Chemistry II.
The course covers kinetics, quantum mechanics, spectroscopy, and other selected topics. Prerequisites: CHEM 3330 with a C or better; MATH 2472 with a “C” or better; and PHYS 2425 with a grade of “C” or higher. about Physical Chemistry II
3 Credit Hours. 4 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Physical Chemistry II

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 higher. about Descriptive Inorganic Chemistry
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Descriptive Inorganic Chemistry

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. Prior completion or concurrent enrollment in BIO 2450 is strongly recommended. Prerequisites CHEM 2342 with a grade of “C” or higher. about Principles of Biochemistry
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Principles of Biochemistry

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 higher. about Analytical Biochemistry
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Analytical Biochemistry

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: CHEM 3375 and MATH 2472 with a “C” or better. about Physical Chemistry for Biochemists
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Physical Chemistry for Biochemists

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 higher, CHEM 1142.
about Quantitative Analysis
4 Credit Hours. 3 Lecture Contact Hours. 6 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
about Quantitative Analysis

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. Prerequisites: CHEM 3245, CHEM 3340, CHEM 3410. Prerequisite or Co-requisite: CHEM 4331. (WI).
2 Credit Hours. 1 Lecture Contact Hour. 4 Lab Contact Hours.
Course Attribute(s): Lab Required|Writing Intensive
Grade Mode: Standard Letter
about Advanced Laboratory I

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. Prerequisites: CHEM 4331, CHEM 4231. Prerequisite or Co-requisite: CHEM 4341. (WI).
2 Credit Hours. 1 Lecture Contact Hour. 4 Lab Contact Hours.
Course Attribute(s): Lab Required|Writing Intensive
Grade Mode: Standard Letter
about Advanced Laboratory II

CHEM 4282. Advanced Biochemistry Research Laboratory.
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. (WI).
2 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.
Course Attribute(s): Lab Required|Writing Intensive
Grade Mode: Standard Letter
about Advanced Biochemistry Research Laboratory

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: Junior standing and an overall GPA of 2.5 or higher.
2 Credit Hours. 1 Lecture Contact Hour. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
about Laboratory Development and Practice
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: Permission of department.
about Undergraduate Research
2 Credit Hours. 0 Lecture Contact Hours. 4 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Lab Required
Grade Mode: Standard Letter
about Undergraduate Research

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 with a grade of "C" or higher.
about Organometallic Chemistry
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Organometallic Chemistry

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.
about Instrumental Analysis
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Instrumental Analysis

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 higher.
about Spectroscopy
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Spectroscopy

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 3341 and CHEM 4331.
about Advanced Inorganic Chemistry
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Advanced Inorganic Chemistry

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.
about Modern Molecular Modeling
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Modern Molecular Modeling

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 higher.
about Introduction to Polymers
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Introduction to Polymers

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.
about Molecular Biology
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Molecular Biology

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 C or better, and permission of department.
about Directed Study
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter
about Directed Study

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 C or better.
about Biochemistry
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Biochemistry
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.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Metabolism

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 higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Writing Intensive
Grade Mode: Standard Letter
about Supramolecular Chemistry

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. Prerequisites: CHEM 3275 with a grade of “C” or higher; CHEM 3380. (WI).

4 Credit Hours. 2 Lecture Contact Hours. 8 Lab Contact Hours.
Course Attribute(s): Lab Required/Writing Intensive
Grade Mode: Standard Letter
about Advanced Biochemistry Lab I

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
about Seminar in Chemistry

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. Graded on a credit (CR), no-credit (F) basis.

1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Course Attribute(s): Graduate Assistantship/Exclude from Graduate GPA
Grade Mode: Leveling/Assistantships
about Professional Development of Graduate Assistants

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. Graded on a credit (CR), progress (PR), no-credit (F) basis.

2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
about Thesis

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
about Laboratory Development Practice

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. Graded on a credit (CR), no-credit (F) basis.

2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Graduate Assistantship/Exclude from Graduate GPA
Grade Mode: Leveling/Assistantships
about Professional Development of Graduate Assistants

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. Graded on a credit (CR), progress (PR), no-credit (F) basis.

2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
about Thesis

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. Prerequisites: CHEM 2342 and CHEM 3341 with a grade of “C” or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Organometallic Chemistry
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 or consent of instructor.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Modern Molecular Modeling

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. Prerequisites: CHEM 4341 or its equivalent may not take this course for master's credit.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Advanced Organic Chemistry

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. Prerequisites: CHEM 2342 and CHEM 2142. Students who have completed CHEM 4333 or its equivalent may not take this course for master's credit.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Physical Chemistry

CHEM 5333. Spectroscopy.
Study of various spectrometric techniques in qualitative and structural analysis of chemical substances. Prerequisites: CHEM 2342 and CHEM 2142. Students who have completed CHEM 4333 or its equivalent may not take this course for master's credit.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Spectroscopy

CHEM 5341. Advanced Inorganic Chemistry.
Chemical bonding, symmetry, and group theory, coordination chemistry, spectroscopy, magnetism, and organometallic compounds along with some descriptive chemistry. This course does not earn graduate degree credit.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from Graduate GPA|Leveling
Grade Mode: Leveling/Assistantships
about Advanced Inorganic Chemistry

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.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Introduction to Polymers and Polymer Synthesis

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 2342 and CHEM 5351.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Polymer Processing and Characterization

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. Prerequisites: CHEM 4351 or its equivalent may not take this course for master's credit.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Physical Chemistry of Polymers

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.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Separation Methods in Chemical Analysis

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.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Problems in Chemistry

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.

Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Biochemistry
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.
about Physical Biochemistry
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.
about Enzymology
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.
about Molecular Biology & Molecular Genetics
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 4360 or CHEM 5383.
about Current Topics in Biochemistry and Molecular Biology
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
CHEM 5385. MPMetabolism.
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.
about MPMetabolism
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.
Prerequisite: CHEM 5375.
about Proteins
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 or equivalent.
about Nucleic Acids Chemistry
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.
about Supramolecular Chemistry
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.
about Fundamentals of Research
3 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours.
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. Graded on a credit (CR), progress (PR), no-credit (F) basis.
about Thesis
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. Graded on a credit (CR), progress (PR), no-credit (F) basis.
about Thesis
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
CHEM 5599A. Thesis.
This course represents a student's initial thesis enrollment. No thesis credit is awarded until student has completed the thesis in CHEM 5599B. Graded on a credit (CR), progress (PR), no-credit (F) basis.
about Thesis
5 Credit Hours. 5 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. Graded on a credit (CR), progress (PR), no-credit (F) basis.
about Thesis
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 1341/CHEM 1141, CHEM 1342/CHEM 1142, CHEM 2341/CHEM 2141, CHEM 2342/CHEM 2142 and CHEM 3410, or consent of instructor.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

about Thesis

about Environmental Chemistry