MASTER OF ARTS (M.A.), MAJOR IN CHEMISTRY

Major Program
Generally, an undergraduate major in chemistry is required for admission into this program.

Admission Policy
For information regarding admission application requirements and deadlines, please visit The Graduate College website at: http://www.gradcollege.txstate.edu/chem.html.

Degree Requirements
The master of arts (M.A.) degree with a major in chemistry requires 30 semester hours of chemistry course work and the successful completion of a comprehensive exam.

CHEM 5370 Problems in Chemistry 3
CHEM 5395 Fundamentals of Research 3
CHEM 5365 Separation Methods in Chemical Analysis 3
CHEM 5321 Advanced Organic Chemistry 3
or CHEM 5330 Physical Chemistry 3
Advisor-approved Chemistry Electives 12
Advisor-approved Electives 6

Total Hours 30

Master's level courses in Chemistry and Biochemistry: CHEM

Courses Offered
Chemistry (CHEM)
CHEM 5110. Seminar in Chemistry.
A course designed to acquaint the graduate student with current research areas in chemistry. May be repeated twice for a total of 3 semester hour credit.
about Seminar in Chemistry
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Seminar in Chemistry

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.
about Thesis
1 Credit Hour. 1 Lecture Contact Hour. 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.
about Laboratory Development Practice
2 Credit Hours. 1 Lecture Contact Hour. 0 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.
about Professional Development of Graduate Assistants
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 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.
about Organometallic Chemistry
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.

3 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 3341 and CHEM 2142. 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
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.

3 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.

3 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.

3 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.

3 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.

3 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.

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

CHEM 5356. 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
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.

3 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.

3 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: Credit/No Credit
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
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.

about Thesis

9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

about Thesis