

Master of Natural Science (MNS)

The MNS in Applied Chemistry at Southeast Missouri State University is designed to give students broad exposure to the instruments, techniques, and methods favored by today's forensic, environmental, industrial, and research labs. The coursework, hands-on experience, and other opportunities work together to make the MNS an applied degree. Students interested in forensic science can choose the Forensic Chemistry Track as a complementary area of study.

There are two degree options for graduate studies in chemistry. The Thesis Option requires the completion of an independent research project and the writing and defense of a thesis describing the research project and its results. The Non-thesis Option requires a written critical evaluation of a specific area of study in chemistry and a written examination on topics covered in coursework completed by the student.

Applied Chemistry students will...

- Interact with highly qualified graduate faculty
- Study in the state-of-the-art, first-rate learning environment provided by the recently renovated Magill Hall of Science, including dedicated forensic science laboratories
- Have opportunities to pursue research and scholarship that help develop independent thinking and problem solving skills
- Develop written and oral scientific presentation skills

Admission Requirements

- Minimum cumulative GPA of 2.5 on a 4.0 scale
- Minimum GPA of 2.75 (on a 4 point scale) for last 30 semester hours of undergraduate science and math courses
- Two letters of recommendation addressing the applicant's potential for academic success
- Completion of the following courses with associated laboratory with a grade of "C" or better in each course: Organic chemistry; analytical chemistry, quantitative analysis or chemical instrumentation; physical chemistry
- Students who do not meet these requirements will be considered on a case by case basis.
- Entering students will take placement exams in Organic, Analytical, and Physical Chemistry

Career Planning

Recent graduates with a Master of Natural Science from Southeast Missouri State University can expect a rewarding career in a variety of fields, such as forensic science, teaching, biotechnology, chemical and pharmaceutical manufacturing, environmental science, product development, quality control, etc. Or they may continue their education through a Ph.D. program in chemistry or forensic science.

Examples of Internships, and Employment of Recent Graduates/Graduate Schools and Programs of Recent Graduates

- Ph.D. programs
 - University of Arizona
 - University of Missouri
 - University of Tulsa
- Forensic Science
 - Arkansas State Crime Lab
 - Arizona Department of Public Safety Scientific Analysis Bureau
 - Bexar County (Texas) Criminal Investigation Laboratory
 - Columbus (Mississippi) Police Department Forensic Laboratory
 - Illinois State Police Forensic Sciences Command
 - Indiana State Police Laboratory Division
 - Johnson County (Kansas) Sheriff's Office Criminalistics Laboratory
 - Missouri State Highway Patrol Crime Laboratory Division
 - US Army Criminal Investigation Laboratory
 - US Bureau of Alcohol, Tobacco, Firearms, and Explosives
 - US Drug Enforcement Administration (DEA)
 - St. Louis Metropolitan Police Crime Laboratory
 - Las Vegas Metropolitan Police Department Forensic Laboratory
- Chemical Industry
 - Colgate-Palmolive
 - Dalton Pharma Services
 - Hach Company
 - Inovatia Laboratories, LLC
 - Lorus Therapeutics Inc.
 - Marathon Oil
 - Monsanto
 - Novus International
 - ReliaGene Technologies, Inc.
 - Sigma-Aldrich
 - Synergy Diagnostic Laboratory
 - US Smokeless Tobacco Company
- High School or college instructors
 - Cape Central High School
 - Southeast Missouri State University
 - University of Tulsa
 - Washington University (St. Louis, MO)

And numerous additional chemical companies, forensic labs, graduate programs, etc.

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This is a guide based on the 2019-2020 Graduate Bulletin and is subject to change. The time it takes to earn a degree will vary based on factors such as dual enrollment, remediation, and summer enrollment. Students meet with an academic advisor each semester and use DegreeWorks to monitor their progress.

CURRICULUM CHECKLIST**32 Hours Required**

Choose One of the Following Tracks:

FORENSIC CHEMISTRY TRACK**Required Courses:**

- ___ CH575 Chemical Instrumentation (4)
- ___ CH607 Introduction to Research and Chemical Literature (3)
- ___ CH608 Seminar (3 enrollments) (0)
- ___ CH609 Seminar (1)
- ___ CH620 Forensic Chemistry (4)
- ___ CH641 Topics in Organic and Biological Chemistry (3) OR CH675 Topics in Analytical Chemistry (3)

OR

- ___ CH 675 Topics in Analytical Chemistry (3)
- ___ MA 623 Statistical Analysis for Forensic Chemistry (3)

Complementary Area:

- ___ FS550 Crime Lab I: Microscopy (2)
- ___ FS552 Crime Lab II: Blood and Fluids (2)
- ___ FS601 Problems in Forensic Science (1)
- ___ 3 Hours of Electives

Choose One of the Following Options:

Thesis option

Choose 6 hours:

- ___ CH676-CH678 Internship in Chemistry (1-3)
- ___ CH691-CH695 Research (3-5)

Non-thesis option

- ___ 6 Hours of Chemistry or Forensic Electives (A maximum of 2 hours of CH511, CH540, CH571 may count as elective credit)

NON-FORENSIC CHEMISTRY TRACK**Required Courses:**

- ___ CH607 Introduction to Research and Chemical Literature (3)
- ___ CH608 Seminar (3 enrollments) (0)
- ___ CH609 Seminar (1)

One Course from the following:

- ___ CH611 Topics in Physical Chemistry (3)
- ___ CH641 Topics in Organic and Biological Chemistry (3)
- ___ CH663 Topics in Inorganic Chemistry (3)
- ___ CH675 Topics in Analytical Chemistry (3)

Choose 8 hours:

- ___ Chemistry Electives (A maximum of 2 hours of CH511, CH540, CH571 may count as elective credit)

Complementary Area

6 Hours from any one department or discipline outside of Chemistry

Choose One of the Following Options:

Thesis option:

5 Hours of Electives

6 Hours from the following:

- ___ CH676-CH678 Internship in Chemistry (1-3)
- ___ CH691-CH695 Research (3-5)

Non-Thesis option

- ___ 3 Hours of Chemistry Electives (CH511, CH540, CH571 may not count towards the Chemistry Electives)
- ___ 8 Hours of Electives

Course Listings*

- ___ CH511 Fundamentals of Physical Chemistry (2)
- ___ Biochemistry (3)
- ___ CH532 Advanced Biochemistry (2)
- ___ CH533 Biochemistry Laboratory
- ___ CH540 Fundamentals of Organic Chemistry (2)
- ___ CH545 Organic Preparations and Characterization (3)
- ___ CH563 Advanced Inorganic Chemistry (3)
- ___ CH565 Inorganic Preparations (2)
- ___ CH571 Fundamentals of Quantitative Analysis (2)
- ___ CH575 Chemical Instrumentation (4)
- ___ CH607 Introduction to Research and Chemical Literature (3)
- ___ CH608 Seminar (0)
- ___ CH609 Seminar (1)
- ___ CH611 Topics in Physical Chemistry (3)
- ___ CH620 Forensic Chemistry (4)
- ___ CH641 Topics in Organic and Biological Chem (3)
- ___ CH647 Advanced One and Two Dimensional Nuclear Magnetic Resonance (NMR) Techniques (3)
- ___ CH663 Topics in Inorganic Chemistry (3)
- ___ CH675 Topics in Analytical Chemistry (3)
- ___ CH676 Internship in Chemistry (1)
- ___ CH677 Internship in Chemistry (2)
- ___ CH678 Internship in Chemistry (3)
- ___ CH688 Problems in Chemistry (1)
- ___ CH688 Problems in Chemistry (2)
- ___ CH691 Research (1)
- ___ CH692 Research (2)
- ___ CH693 Research (3)
- ___ CH694 Research (4)
- ___ CH695 Research (5)
- ___ FS550 Crime Lab I: Microscopy (2)
- ___ FS552 Crime Lab II: Blood and Fluids (2)
- ___ FS553 Crime Lab III: Introductory Analysis of Pattern Evidence (3)
- ___ FS601 Problems in Forensic Science (1)
- ___ FS603 Problems in Forensic Science (3)

*Course descriptions may be found in the Graduate Bulletin.

Degree Requirements

The curriculum of each Chemistry graduate student will vary depending on their selected Track, option, interests, and placement exam results. Thus, no two graduate students will necessarily have exactly the same curriculum. Each graduate student should create their semester-by-semester degree plan (and course curriculum) with their graduate advisor during their first semester in graduate school.