

**Master of Natural Science (MNS)**

The MNS in 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.

**Becoming Career Ready...**

/Students interact with highly qualified graduate faculty.

/Students study in a state-of-the-art, first-rate learning environment provided by the recently renovated Magill Hall of Science, including dedicated forensic science laboratories.

/Students have opportunities to pursue research and scholarship that help develop independent thinking and problem solving skills.

/Students develop written and oral scientific presentation skills.

**Admission Requirements**

1. An undergraduate GPA of 2.5 on a 4.0 scale
2. Minimum GPA of 2.75 on a 4.0 scale for last 30 semester hours of undergraduate science and math courses
3. Two letters of recommendation addressing the applicant's potential for academic success
4. 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
5. Students who do not meet these requirements will be considered on a case by case basis.
6. 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 2020-2021 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 Degree Works to monitor their progress.

**CURRICULUM CHECKLIST****32 Hours Required**

Choose One of the Following Tracks:

**FORENSIC CHEMISTRY TRACK****Required Courses:**

- \_\_\_ CH575/075 Chemical Instrumentation (4)
- \_\_\_ CH607 Introduction to Research and Chemical Literature (3)
- \_\_\_ CH608 Seminar (3 enrollments) (0)
- \_\_\_ CH609 Seminar (1)
- \_\_\_ CH620 Forensic Chemistry (4)
- \_\_\_ MA 623 Statistical Analysis for Forensic Chemistry (3)

Choose 3 hours:

- \_\_\_ CH641 Topics in Organic and Biological Chemistry (3)
- \_\_\_ CH 675 Topics in Analytical 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)

Choose 3 hours:

- \_\_\_ 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.