MNS: Chemistry

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.

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

- 1) Minimum GPA of 2.75 (on a 4 point scale) for last 30 semester hours of undergraduate science and math courses.
- 2) Two letters of recommendation addressing the applicant's potential for academic success in the respective area of emphasis.
- 3) Submission of scores for the general portion of the Graduate Record Exam (verbal, quantitative, and analytical) (waived for Southeast graduates)
- 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.

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.
# MNS: Chemistry

## CURRICULUM CHECKLIST

### CHEMISTRY - 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)
- ___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)
- ___FS601 Problems in Forensic Science (1)
- ___FS553 Crime Lab III: Introductory Analysis of Pattern Evidence (3)
- ___FS601 Problems in Forensic Science (1)

**Complementary Area:**
- ___FS550 Crime Lab I: Microscopy (2)
- ___FS552 Crime Lab II: Blood and Fluids (2)
- ___FS601 Problems in Forensic Science (1)

6 Hours of 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)

8 Hours of 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)
- ___CH531 Foundations of 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)

**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.

*Course descriptions may be found in the Graduate Bulletin.