

Bachelor of Science (BS)

DNA Analysis Option

Forensic science is the application of scientific principles to civil and criminal laws, and as such, plays a vital role in the criminal justice system. Forensic science is a very broad field that includes areas such as ballistics, crime scene investigation, DNA analysis, forensic toxicology, fingerprint analysis, forensic drug analysis and digital forensic analysis, just to name a few. Forensic DNA analysts perform analyses on the DNA extracted from bone, hair, saliva, blood or other bodily tissues in order to match a suspect to crime scene evidence. Because of its accuracy, DNA analysis provides a powerful tool for solving crimes. DNA analysts use a variety of sophisticated techniques, including the polymerase chain reaction (PCR), gel and capillary electrophoresis, and DNA sequencing, and apply knowledge from diverse areas, such as chemistry, biology and genetics, to help solve crimes. They are often called to testify in court as expert witnesses. Most forensic DNA analysts are employed in crime labs associated with local, state or federal law enforcement agencies. Those interested in a challenging and rewarding career that provides financial security, promotes self-respect and offers the opportunity to work on stimulating projects should consider a career in forensic science.

Becoming Career Ready...

/ Faculty with experience, including current and former forensic professionals, work closely with students preparing them for the forensics field. Faculty-mentored research will help you develop the professional skills needed for success in a competitive job market and/or advanced study in graduate and professional programs.

/ The DNA Analysis curriculum prepares graduates for careers in forensic science, DNA analysis, or chemistry and also provides an excellent basis for graduate and professional areas of study. Example job titles include forensic science technician, forensic scientist, crime lab technician, and DNA analyst.

/ 100% of Southeast programs offer real-world experience. DNA Analysis students earn this experience through hands-on experience and training in our forensic education lab, i.e. our "mock" crime lab, using the same methods, chemical instruments, and tools used by forensic professionals. This lab was fully equipped with a \$700,000 grant from the federal government.

/ The BS Chemistry: DNA Analysis option was crafted in close consultation with the Federal Bureau of Investigation's (FBI) Quality Assurance Standards for Forensic DNA Testing Laboratories to ensure that you will leave Southeast fully qualified to begin your career as a DNA analyst in forensic and other DNA testing laboratories.

/ The path to a successful career starts with you! You can maximize your career development by working closely with Career Services and Southeast faculty – they are here to help you connect your passions, interests and skills to jobs and opportunities in the field. Career Services provides professional career counseling and coaching, resume critiques, practice interviews, job search strategies, career events, networking opportunities and more.

Internships, Employment Opportunities and Graduate Schools of Recent Graduates:

- Arkansas State Crime Laboratory
- Illinois State Police Forensic Sciences Command
- Missouri State Highway Patrol Crime Laboratory Division
- Saint Louis Metropolitan Police Department
- US Army Criminal Investigation Laboratory
- US Bureau of Alcohol, Tobacco, Firearms, and Explosives
- United States Drug Enforcement Administration
- Numerous state and local forensic laboratories nationwide
- Biokyowa
- Buzzi Unicem USA
- Eli Lilly
- Exxon Mobil
- Monsanto
- Pharmacia (currently part of Pfizer)
- PPG Industries
- Proctor and Gamble
- MilliporeSigma
- Numerous additional chemical companies
- John Hopkins University
- Purdue University
- University of Illinois (School of Medicine, Graduate School)
- University of Notre Dame
- University of Wisconsin – Madison
- Washington University
- Michigan State University
- Numerous additional top-tier chemistry graduate and professional schools

Special Options with Chemistry

Southeast offers a Master of Natural Science in Applied Chemistry with a Forensic Chemistry option.

Career Information

To learn more about career opportunities in chemistry visit:

<https://www.acs.org/content/acs/en/careers/college-to-career.html>.

According to the United States Bureau of Labor Statistics, there were 15400 forensic science related jobs in 2016. This number is expected to increase by 17% by 2026. Source:

<https://www.bls.gov/ooh/life-physical-and-social-science/forensic-science-technicians.htm#tab-6>.

Transfer and Dual Credit Students

If you have dual credit or transfer credit, please visit our transfer course equivalencies guide at semo.edu/transfercredit.

To learn more
Office of Admissions
(573) 651-2590
admissions@semo.edu
semo.edu

To explore
the College of Science,
Technology, Engineering and
Mathematics online, visit
semo.edu/stem

For advising
Center for Academic Advising
semo.edu/advising

Chemistry: DNA Analysis Option

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

CURRICULUM CHECKLIST

"Critical Courses" are italicized and bolded. Data shows that students who have completed this course in the first two years and have earned the noted grade are most likely to complete this program of study.

Required Courses:

- ___ **CH185** *General Chemistry (5)*
- ___ **CH186** *Foundations of Inorganic Chemistry (3)*
- ___ CH187 Inorganic Chemistry and Qualitative Analysis Laboratory (2)
- ___ CH271 Foundations of Analytical Chemistry (5)
- ___ CH311 Foundations of Physical Chemistry (4)
- ___ CH313 Physical Chemistry Laboratory (3)
- ___ **CH341** *Foundations of Organic Chemistry (4)*
- ___ CH342 Organic Chemistry Laboratory I (1)
- ___ CH498 Professional Presentation in Chemistry (1)
- ___ CH531 Foundations of Biochemistry (3)
OR
- ___ UI331 Foundations of Biochemistry (3)
- ___ UI443 Professional Experience in Chemistry (3)

DNA Analysis Courses:

- ___ BI173 Cell & Organismal Biology (4)
- ___ BI245 Lab Methods in Biotechnology (3)
- ___ BI283 Genetics (4)
- ___ BI310 General Microbiology (4)
- ___ BI450 Molecular Biology (3)
- ___ CH312 Advanced Physical Chemistry (3)
- ___ CH420 Forensic Chemistry (4)
- ___ CH533 Biochemistry Laboratory (2)
- ___ MA423 Statistical Analysis for Forensic Science (3)

Additional Requirements:

- ___ **MA140** *Analytical Geometry and Calculus I (5)*
- ___ MA145 Analytical Geometry and Calculus II (4)
- ___ PH120/020 Introductory Physics I (5)
AND
- ___ PH121/021 Introductory Physics II (5)
OR
- ___ PH230/030 General Physics I (5)
AND
- ___ PH231/031 General Physics II (5)

Note: Completion of an experiential learning project (undergraduate research or internship) in the major is required. The departmental advisor should be consulted for information about this requirement.

General Education Requirements – some requirements may be fulfilled by coursework in major program

- Social and Behavioral Sciences – 6 hours
- Constitution Requirement – 3 hours
- Written Communication – 6 hours
- Oral Communication – 3 hours
- Natural Sciences – 7 hours (from two disciplines, one to include a lab)
- Mathematics – 3 hours
- Humanities & Fine Arts – 9 hours (from at least two disciplines)
- Additional requirements – 5 hours (to include UI100 for native students)
- Civics examination

SAMPLE FOUR-YEAR PLAN

	Fall Semester		Spring Semester	
	Course #	Hrs	Course #	Hrs
FIRST YEAR	UI100	3	BI173	4
	EN100	3	CH186	3
	CH185/CH085/CH005	5	CH187	2
	General Education	3	MA140	5
			General Education	3
	Total	14	Total	17
Milestone: maintain 2.0 cumulative GPA				
SECOND YEAR	BI283	4	BI245	3
	CH271/071	5	CH341	4
	MA145	4	CH342	1
	General Education	5	PH121/021 or PH231/031	5
			General Education	3
	Total	18	Total	16
Milestone: maintain 2.0 cumulative GPA				
<i>(summer courses are encouraged to avoid 18 hour semesters)</i>				
THIRD YEAR	BI310	4	CH312	3
	CH311	4	CH313	3
	MA423	3	UI443	3
	General Education	3	General Education	3
			General Education	3
	Total	14	Total	15
Milestone: maintain 2.0 cumulative GPA				
FOURTH YEAR	BI450	3	CH498	1
	CH420	4	CH533	2
	UI331 or CH531	3	General Education	3
	General Education	3	General Education	3
	Elective	1	General Education	3
	Total	14	Total	12
Milestone: maintain 2.0 cumulative GPA				

A "Milestone" signifies a significant stage for a student in the completion of a degree.

Degree requirements for all students: a minimum of 120 credit hours, completion of the General Education program, completion of 39 senior division hours (300-599), Writing Proficiency Exam (WP003).

Refer to the Undergraduate Bulletin or Degree Works for additional graduation requirements for your program.

A minimum 2.0 GPA in the major and overall are required to graduate with a BS in Chemistry degree.