

**Bachelor of Science (BS)**

# DNA Analysis Option

Chemistry is the branch of natural science that deals with the properties and classification of matter, the changes that matter undergoes, and the energy associated with these changes. Research by chemists increases our knowledge about chemicals and their roles in the natural world and has led to the discovery and development of new and improved products and advances in medicine, agriculture, food processing and other fields. Those interested in a rewarding career that provides financial security, promotes self-respect and offers the opportunity to work on stimulating and breakthrough projects should consider a career in chemistry.

This degree program was crafted in close consultation with the Federal Bureau of Investigation's (FBI) Quality Assurance Standards for Forensic DNA Testing Laboratories. This ensures that graduates leave Southeast fully qualified to begin a career as a DNA analyst in forensic and other DNA testing laboratories.

**Chemistry students will...**

- Gain a rigorous foundation in chemistry, science, math and DNA analysis in the context of a broad university education.
- Interact closely with experienced faculty who are recognized for their writing, training, professional affiliations and expertise.
- Study in the state-of-the-art, first-rate learning environment provided by the newly renovated Magill Hall of Science, including dedicated forensic science and DNA analysis labs.
- Have opportunities to pursue research and scholarship that help develop independent thinking and problem solving.
- Meet educational requirements for DNA analysts prescribed by the FBI's Quality Assurance Standards for Forensic DNA Testing Laboratories.

**Career Planning**

Career preparation is part of the mission of Southeast. 100% of programs offer our students an internship, study-abroad program, clinical opportunity, student teaching or research internship.

Approximately 35-40% of chemistry graduates pursue graduate or professional programs of study immediately upon graduation. The others pursue employment opportunities in chemistry or other fields. Employment opportunities for chemists exist in a variety of fields, such as biotechnology, biochemistry, chemical manufacturing, environmental monitoring and compliance, industrial hygiene, materials science, pharmaceutical manufacturing, product development, quality control, sales (pharmaceuticals, chemicals, instruments), and technical management.

The Office of Career Services in Academic Hall 057 can provide students with 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
- Sigma-Aldrich
- 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
- Numerous additional top-tier chemistry graduate and professional schools

**Special Options with Chemistry**

Southeast offers a Master of Natural Science in Applied Chemistry.

**Transfer and Dual Credit Students**

If you have dual credit or transfer credit, please visit our transfer course equivalencies guide at [semo.edu/transfercredit](http://semo.edu/transfercredit).

**To learn more**  
Office of Admissions  
(573) 651-2590  
[admissions@semo.edu](mailto:admissions@semo.edu)  
[semo.edu](http://semo.edu)

**To explore**  
the College of Science,  
Technology, Engineering and  
Mathematics online, visit  
[semo.edu/stem](http://semo.edu/stem)

**For advising**  
Center for Academic Advising  
[semo.edu/advising](http://semo.edu/advising)

# Chemistry: DNA Analysis Option

## Bachelor of Science (BS)

This is a guide based on the 2018-2019 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.

**University Studies Requirements** – some requirements may be fulfilled by coursework in major program

- Social and Behavioral Sciences – 3 hours
- Constitution requirement – 3 hours
- US History 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)

### SAMPLE FOUR-YEAR PLAN

	Fall Semester		Spring Semester	
	Course #	Hrs	Course #	Hrs
<b>FIRST YEAR</b>	UI100	3	BI173	4
	EN100	3	<b>CH186</b>	3
	<b>CH185/CH085/CH005</b>	5	CH187	2
	University Studies	3	<b>MA140</b>	5
			University Studies	3
	<b>Total</b>	<b>14</b>	<b>Total</b>	<b>17</b>
Milestone: maintain 2.0 cumulative GPA				
<b>SECOND YEAR</b>	BI283	4	BI245	3
	CH271	5	<b>CH341</b>	4
	MA145	4	CH342	1
	University Studies	5	PH121/021 or PH231/031	5
			University Studies	3
	<b>Total</b>	<b>18</b>	<b>Total</b>	<b>16</b>
Milestone: maintain 2.0 cumulative GPA				
<i>(summer courses are encouraged to avoid 18 hour semesters)</i>				
<b>THIRD YEAR</b>	BI310	4	CH312	3
	CH311	4	CH313	3
	MA423	3	UI443	3
	University Studies	3	University Studies	3
			University Studies	3
	<b>Total</b>	<b>14</b>	<b>Total</b>	<b>15</b>
Milestone: maintain 2.0 cumulative GPA				
<b>FOURTH YEAR</b>	BI450	3	CH498	1
	CH420	4	CH533	2
	UI331 or CH531	3	University Studies	3
	University Studies	3	University Studies	3
	Elective	1	University Studies	3
	<b>Total</b>	<b>14</b>	<b>Total</b>	<b>12</b>
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 University Studies program, completion of 39 senior division hours (300-599), Writing Proficiency Exam (WP003), and completion of the Measure of Academic Proficiency and Progress (MAP) at the senior level. 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.