

FORENSIC SCIENCE, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

Program Description

Forensic Science is the application of scientific principles and methods to assist criminal and civil investigations and litigation. This major is an inter-college collaboration among academic units and provides students with a strong foundation in the biological, physical, and mathematical sciences. It introduces them to relevant topics in criminalistics, forensic chemistry, forensic biology, crime scene investigation, and appropriate social sciences. Students are educated on the role of forensic scientists in the criminal justice system, the collection and analysis of scientific evidence, and the manner in which evidence is presented in court. Graduates of this major could pursue employment as a scientist in a federal, state, or private forensic laboratory or with insurance companies, homeland security agencies, or the judicial community. Graduates could also choose to pursue advanced degrees, for example, in forensic science, medicine, psychology, anthropology, pathology, odontology, entomology, toxicology, law, or in the general sciences.

What is Forensic Science?

Forensic Science is the application of principles of chemistry, molecular biology, and physics to matters of the law. Forensic scientists develop a deep understanding of and hands-on lab experience in serology, biochemistry, and forensic molecular biology, with particular emphasis on forensic DNA analysis. Forensic scientists also use analytical, physical, and inorganic chemistry for the forensic analysis of controlled substances, trace evidence, fire debris, ignitable liquids, and firearms and gunshot residue. In the United States there are more than 4,000 crime scene laboratories administered by the federal, state or local governments or private industry. Our Forensic Science program provides a strong scientific foundation and general criminalistics education to all students, and allows room for students to individualize their education experience towards specific degree and career goals.

You Might Like This Program If...

- You are interested in utilizing your scientific knowledge to help solve complex problems concerning civil, criminal, and homeland security issues.
- You like and want to further study several science disciplines.
- You want to understand how evidence is collected at the crime scene, analyzed in the laboratory, and presented in courts of law.
- You want to utilize state-of-the-art instrumentation to analyze materials as part of laboratory exercises.
- You want to pursue a career in forensic science casework, research, or education.

Entrance to Major

In order to be eligible for entrance to the Forensic Science major, a student must have:

1. attained at least a 2.00 cumulative grade point average
2. completed and earned a grade of C or better in each of the following courses: CHEM 110, CHEM 111, CHEM 112, FRNSC 210, and MATH 140.

Degree Requirements

For the Bachelor of Science degree in Forensic Science, a minimum of 124-126 credits is required:

Requirement	Credits
General Education	45
Requirements for the Major	97-99

General Education

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (<http://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program>) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required.)

- **Quantification (GQ):** 6 credits
- **Writing and Speaking (GWS):** 9 credits

Knowledge Domains

- **Arts (GA):** 6 credits
- **Health and Wellness (GHW):** 3 credits
- **Humanities (GH):** 6 credits
- **Social and Behavioral Sciences (GS):** 6 credits
- **Natural Sciences (GN):** 9 credits

Integrative Studies (may also complete a Knowledge Domain requirement)

- **Inter-Domain or Approved Linked Courses:** 6 credits

18 of these 45 credits are included in the Requirements for the Major.

University Degree Requirements

First Year Engagement

All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement

6 credits are required and may satisfy other requirements

- **United States Cultures:** 3 credits
- **International Cultures:** 3 credits

Writing Across the Curriculum

3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits

A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work

Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition

The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80>)). For more information, check the Suggested Academic Plan for your intended program.

Requirements for the Major

This includes 18 credits of General Education courses: 9 credits of GN courses; 6 credits of GQ courses; 3 credits of GH courses.

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44>).

Common Requirements for the Major (All Options)

Code	Title	Credits
Prescribed Courses		
<i>Prescribed Courses: Require a grade of C or better</i>		
CHEM 110	Chemical Principles I	3
CHEM 111	Experimental Chemistry I	1
CHEM 112	Chemical Principles II	3
CHEM 113	Experimental Chemistry II	1
CHEM 210	Organic Chemistry I	3
CHEM 212	Organic Chemistry II	3
CHEM 213	Laboratory in Organic Chemistry	2
MATH 140	Calculus With Analytic Geometry I	4
MATH 141	Calculus with Analytic Geometry II	4
PHIL 132	Introduction to Bioethics	3
FRNSC 100	Introduction to Forensic Science	3
FRNSC 210	Essential Practices of Forensic Science	3
FRNSC 410	A Scientific Approach to Crime Scene Investigation	2
FRNSC 415	Laboratory in Crime Scene Investigation	2
FRNSC 411	Criminalistics: Trace and Impression Evidence	3
FRNSC 413	Criminalistics: Biology	3
STAT 250	Introduction to Biostatistics	3
FRNSC 400	Courtroom Proceedings and Testimony	1
FRNSC 475	Forensic Science Seminar	1
FRNSC 485	Coalescence of Forensic Science Concepts.	4

Additional Courses

<i>Additional Courses: Require a grade of C or better</i>		
CRIM 100	Introduction to Criminal Justice	3
or CRIM 113	Introduction to Law	
Select one of the following sequences:		
PHYS 250	Introductory Physics I	8
& PHYS 251	and Introductory Physics II	
PHYS 211	General Physics: Mechanics	8
& PHYS 212	and General Physics: Electricity and Magnetism	

Requirements for the Option

Select an option	34-36
------------------	-------

Requirements for the Option

Forensic Biology Option (36 credits)

Code	Title	Credits
Prescribed Courses		
<i>Prescribed Courses: Require a grade of C or better</i>		
BMB 251	Molecular and Cell Biology I	3
MICRB 201	Introductory Microbiology	3
MICRB 202	Introductory Microbiology Laboratory	2
BMB 400	Molecular Biology of the Gene	3
BMB 401	General Biochemistry	3
BMB 442	Laboratory in Proteins, Nucleic Acids, and Molecular Cloning	3
FRNSC 421		4

Additional Courses

<i>Additional Courses: Require a grade of C or better</i>		
BIOL 222	Genetics	3
or BIOL 322	Genetic Analysis	
Select two of the following:		
BMB 402	General Biochemistry	6
BMB 428	Physical Chemistry with Biological Applications	
BMB 433	Molecular and Cellular Toxicology	
BIOL 405	Molecular Evolution	
BIOL 422	Advanced Genetics	6
BIOL 460	Human Genetics	

Supporting Courses and Related Areas

Select 6 credits in consultation with adviser	6
---	---

Forensic Chemistry Option (34 credits)

Code	Title	Credits
Prescribed Courses		
<i>Prescribed Courses: Require a grade of C or better</i>		
BIOL 110	Biology: Basic Concepts and Biodiversity	4
BIOL 230W	Biology: Molecules and Cells	4
CHEM 227	Analytical Chemistry	4
CHEM 425W	Chromatography and Electrochemistry	4
FRNSC 427		4
Additional Courses		
<i>Additional Courses: Require a grade of C or better</i>		
Select three of the following:		
BMB 428	Physical Chemistry with Biological Applications	9
CHEM 410	Inorganic Chemistry	
CHEM 412	Transition Metal Chemistry	

CHEM 423W	Chemical Spectroscopy
CHEM 430	Structural Analysis of Organic Compounds
CHEM 431W	Organic and Inorganic Preparations
CHEM 450	Physical Chemistry - Thermodynamics
CHEM 452	Physical Chemistry - Quantum Chemistry

Supporting Courses and Related Areas

Select 6 credits in consultation with adviser 6

Academic Advising

The objectives of the university's academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information need to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy>)

University Park

Mary Sergeant

Academic Adviser

234 Ritenour Building

University Park, PA 16802

814-863-9572

mym7@psu.edu

Suggested Academic Plan

Biology Option at University Park Campus

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

First Year

Fall	Credits Spring	Credits
CHEM 110 ^{*#†}	3 CHEM 112 ^{*#†}	3
CHEM 111 ^{*#†}	1 CHEM 113 ^{*†}	1
MATH 140 ^{*†#†}	4 MATH 141 ^{*††}	4
PSU 16	1 FRNSC 100 [*]	3
CRIM 100 [*]	3 General Education Course	3
ENGL 15, 30, or ESL 15 [‡]	3	
	15	14

Second Year

Fall	Credits Spring	Credits
CHEM 210 [*]	3 CHEM 212 [*]	3
BMB 251 [*]	3 CHEM 213 [*]	2

PHYS 211 (consult with an academic adviser for alternative options) ^{*†}	4 MICRB 201 [*]	3
FRNSC 210 ^{*#}	3 MICRB 202 [*]	2
General Education Course	3 STAT 250 (consult an academic adviser for alternative options) [*]	3
	PHYS 212 (consult with an academic adviser for alternative options) ^{*†}	4
	16	17

Third Year

Fall	Credits Spring	Credits
BIOL 222 (consult with an academic adviser for alternative options) [*]	3 BMB 401 [*]	3
FRNSC 410 [*]	2 FRNSC 411 [*]	3
FRNSC 413 [†]	3 FRNSC 415 [*]	2
CAS 100, 100A, 100B, or 100C [‡]	3 PHIL 132 (consult an academic adviser for alternative options) ^{*†}	3
General Education Course	3 ENGL 202C, 202A, 202B, or 202D	3
	Supporting course (consult with an academic adviser for options) [*]	3
	14	17

Fourth Year

Fall	Credits Spring	Credits
BMB 400 [*]	3 FRNSC 485 [*]	4
Supporting course (consult with an academic adviser for options) [*]	3 FRNSC 475 [*]	1
General Education Course	3 Supporting course (consult with an academic adviser for options) [*]	3
General Education Course	3 FRNSC 421 [*]	4
BMB 442 [*]	3 General Education Course	3
FRNSC 400	1 Supporting course (consult with an academic adviser for options) [*]	3
	16	18

Total Credits 127

* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy University Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of 'C' or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

All incoming Schreyer Honors College first-year students at University Park will take ENGL/CAS 137 in the fall semester and ENGL/CAS 138 in the spring semester. These courses carry the GWS designation and replace both ENGL 30 and CAS 100. Each course is 3 credits.

Chemistry Option at University Park Campus

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

First Year

Fall	Credits	Spring	Credits
CHEM 110 ^{*#†}	3	CHEM 112 ^{*#†}	3
CHEM 111 ^{*#†}	1	CHEM 113 ^{*†}	1
MATH 140 ^{*†##}	4	MATH 141 ^{*††}	4
PSU 16	1	FRNSC 100 [*]	3
CRIM 100 [*]	3	General Education Course	3
ENGL 15, 30, or ESL 15 [†]	3	General Education Course	3
	15		17

Second Year

Fall	Credits	Spring	Credits
CHEM 210 [*]	3	CHEM 212 [*]	3
FRNSC 210 ^{*#}	3	CHEM 213 [*]	2
PHYS 211 ^{*†}	4	STAT 250 (consult with an academic adviser for alternative options) [*]	3
General Education Course	3	PHYS 212 (consult with an academic adviser for alternative options) ^{*†}	4
BIOL 110 ^{*†}	4	BIOL 230W [*]	4
	17		16

Third Year

Fall	Credits	Spring	Credits
CAS 100, 100A, 100B, or 100C [‡]	3	PHIL 132 (consult with an academic adviser for alternative options) ^{*†}	3
CHEM 227 [*]	4	FRNSC 413 [*]	3
FRNSC 411 [*]	3	Supporting course (consult with an academic adviser for options) [*]	3

Supporting course (consult with an academic adviser for options) [*]	3	General Education Course	3
FRNSC 410 [*]	2	Supporting course (consult with an academic adviser for options) [*]	3
	15		15

Fourth Year

Fall	Credits	Spring	Credits
General Education Course	3	FRNSC 485 [*]	4
Supporting course (consult with an academic adviser for options) [*]	3	FRNSC 475 [*]	1
Supporting course (consult with an academic adviser for options) [*]	3	General Education Course	3
FRNSC 400 [*]	1	ENGL 202C, 202A, 202B, or 202D [‡]	3
FRNSC 415 [*]	2	FRNSC 427 [*]	4
CHEM 425W [*]	4		
	16		15

Total Credits 126

* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy University Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of 'C' or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

All incoming Schreyer Honors College first-year students at University Park will take ENGL/CAS 137 in the fall semester and ENGL/CAS 138 in the spring semester. These courses carry the GWS designation and replace both ENGL 30 and CAS 100. Each course is 3 credits.

Career Paths

The Forensic Science program provides students with a strong foundation in the natural sciences. In addition, students will be introduced to the criminalistics philosophy through intensive scientific

and laboratory problem-solving skills that are necessary for their success in forensic laboratory careers or graduate-level academic settings.

MORE INFORMATION ABOUT CAREERS (<http://forensics.psu.edu/resources/job-opportunities>)

MORE INFORMATION ABOUT OPPORTUNITIES FOR GRADUATE STUDIES (<https://www.aafs.org/students/college-university-listings>)

Professional Resources

- Northeastern Association of Forensic Scientists (<http://neafs.org>)
- National Institute of Standards and Technology (NIST) (<http://www.nist.gov/topics/forensic-science/organization-scientific-area-committees-osac>)
- Organization of Scientific Area Committees (<http://www.nist.gov/topics/forensic-science/organization-scientific-area-committees-osac>)
- American Academy of Forensic Sciences (<http://www.aafs.org>)
- American Board of Criminalists (<http://www.criminalistics.com>)
- International Association for Identification (<http://www.theiai.org>)
- California Association of Criminalists (<http://www.cacnews.org>)
- American Society of Trace Evidence Examiners (<http://www.asteetrace.org>)
- New Jersey Association of Forensic Scientists (<http://www.njafs.org>)
- Mid-Atlantic Association of Forensic Scientists (<http://www.maafs.org>)
- Corporate Partners (<http://forensics.psu.edu/alumni-industry/corporate-partners>)

Accreditation

Our degree programs in Forensic Science are accredited by the Forensic Science Education Programs Accreditation Commission (FEPAC). FEPAC promotes academic quality through formal accreditation of forensic science programs. Meeting FEPAC guidelines assures the public that our programs are of the highest quality.

MORE INFORMATION (<http://forensics.psu.edu/fepac>)

Contact

University Park

DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOLOGY
329 Whitmore Lab
University Park, PA 16802
814-867-2465
mrd1@psu.edu

<http://forensics.psu.edu/>