Forensic Biology, B.S.

Degree Offered

- Bachelor of Science

Nature of the Program

The Department of Forensic and Investigative Science (FIS) offers a Bachelor of Science degree in three major areas: Forensic Biology, Forensic Chemistry, and Forensic Examiner. All of these majors provide students with a strong background in the fundamental science and applied practice associated with forensic science. The Program is accredited by the Forensic Education Programs Accreditation Commission (http://fepac-edu.org/) (FEPAC).

Because of the unique nature of the profession of forensic science, students are forewarned that a record of criminal, unethical, or other socially unacceptable behavior (such as illicit drug use or alcohol offenses) could negatively affect their ability to pass a background check, which may in turn make it difficult or impossible and complete the degree. Department guidelines are available from departmental advisers.

Students who earn a degree in the Eberly College of Arts and Sciences must complete the University requirements, the College requirements for their specific degree program, and their major requirements.

Minors

All students have the possibility of earning one or more minors; click the following link for a list of all available minors and their requirements (http://catalog.wvu.edu/undergraduate/minors/). Please note that students may not earn a minor in their major field.

FACULTY

CHAIR

- Casper Venter - Ph.D. (University of South Africa)

DIRECTOR OF GRADUATE STUDIES

- Tina Moroose - M.S. (Marshall University)

DIRECTOR OF UNDERGRADUATE STUDIES

- Rachel Mohr - Ph.D. (Texas A&M University)

PROFESSORS

- Glen Jackson - Ph.D. (West Virginia University)
  Regular Graduate Faculty, Ming Hsieh Distinguished Professor, Forensic Chemistry, Mass Spectrometry
- Keith Morris - Ph.D. (University of Port Elizabeth)
  Regular Graduate Faculty, Ming Hsieh Distinguished Professor, Impression Evidence, Evidence Interpretation

ASSOCIATE PROFESSORS

- Tina Moroose - M.S. (Marshall University)
  Regular Graduate Faculty, Forensic Biology, Quality Assurance
- Jacqueline Speir - Ph.D. (Rochester Institute of Technology)
  Regular Graduate Faculty, Forensic Informatics, Microscopy

ASSISTANT PROFESSORS

- Luis Arroyo - Ph.D. (Florida International University)
  Regular Graduate Faculty, Toxicology, Environmental Forensics
- Robin Bowen - Ph.D. (West Virginia University)
  Associate Graduate Faculty, Ethics, Bloodstain Pattern Analysis
- Tiffany Edwards - M.S. (University of Central Oklahoma)
  Criminalistics, Death Investigation
- Arati Iyengar - Ph.D. (University of Southampton)
  Regular Graduate Faculty, DNA, Forensic Genetics
- Roger Jefferys - M.S. (West Virginia University)
  Criminalistics

- Lisa Licata - M.S. (University of North Texas Health Science Center)
  Criminalistics, DNA
- Rachel Mohr - Ph.D. (Texas A&M University)
  Associate Graduate Faculty, Forensic Entomology
- Robert O'Brien - M.S. (St. Joseph's College)
  Associate Graduate Faculty, Crime Scene Investigation
- Tatiana Trejos - Ph.D. (Florida International University)
  Regular Graduate Faculty, Trace Evidence, Elemental Analysis

Admissions

- First Time Freshmen with a MATH ACT of 22 or a MATH SAT of 540 or with a 3.75 cumulative high school GPA are admitted to the major directly. A minimum ALEKS score of 45 is recommended for the timely completion of the degree.
- Students who wish to transfer from another WVU major must have completed CHEM 115 or higher with a C-.
- Students wishing to transfer from outside of WVU must must have completed CHEM 115 or higher with a C-.

Students who do not meet these requirements will be advised by the Center for Learning, Advising, and Student Success. Only students who are admitted directly are eligible to participate in the Living Learning Community and other departmentally-sponsored first-year programs.

ADMISSION REQUIREMENTS 2024-2025

The Admission Requirements above will be the same for the 2024-2025 Academic Year.

Major Code: 14D9

General Education Foundations

Please use this link to view a list of courses that meet each GEF requirement. **(**http://registrar.wvu.edu/gef/**)**

NOTE: Some major requirements will fulfill specific GEF requirements. Please see the curriculum requirements listed below for details on which GEFs you will need to select.

Code	Title	Hours
General Education Foundations		
F1 - Composition & Rhetoric		3-6
ENGL 101 & ENGL 102	Introduction to Composition and Rhetoric and Composition, Rhetoric, and Research	
or ENGL 103	Accelerated Academic Writing	
F2A/F2B - Science & Technology		4-6
F3 - Math & Quantitative Reasoning		3-4
F4 - Society & Connections		3
F5 - Human Inquiry & the Past		3
F6 - The Arts & Creativity		3
F7 - Global Studies & Diversity		3
F8 - Focus (may be satisfied by completion of a minor, double major, or dual degree)		9
Total Hours		31-37

Please note that not all of the GEF courses are offered at all campuses. Students should consult with their advisor or academic department regarding the GEF course offerings available at their campus.

Degree Requirements

Students must complete WVU General Education Foundations requirements, College B.S. requirements, major requirements, and electives to total a minimum of 120 hours. For complete details on these requirements, visit the B.S. Degrees tab on the Eberly College of Arts and Sciences (http://catalog.wvu.edu/undergraduate/eberlycollegeofartsandsciences/#bachelorofsciencetext) pages.

Departmental Requirements for the B.S. in Forensic Biology

- **Capstone Requirement:** The university requires the successful completion of a Capstone course. Forensic Biology majors must complete FIS 406.
- **Writing and Communication Skills Requirement**: The Forensic Biology Bachelor of Science is a **SpeakWrite Certified Program™**. SpeakWrite Certified programs incorporate and develop students' written, verbal, visual, and mediated communication skills across the curriculum.

- **Calculation of the GPA in the Major**: A minimum grade of C- or better in all courses applied to major requirements, including the STEM Foundations. If a course is repeated, all attempts will be included in the calculation of the GPA, unless the course is eligible for a D/F repeat.
- **Internship Requirement**: All students are required to successfully complete the FIS 386 internship course for at least 3 hours of credit.

Curriculum Requirements

Code	Title	Hours
University Requirements		28
ECAS B.S. Requirements		4
Forensic Biology Major Requirements		88
Total Hours		120

University Requirements

Code	Title	Hours
General Education Foundations (GEF) 1, 2, 3, 4, 5, 6, 7, and 8 (31-37 Credits)		
Outstanding GEF Requirements 1, 4, 5, 6, and 7		18
FIS 191	First-Year Seminar	1
General Electives		9
Total Hours		28

ECAS Bachelor of Science Requirements

Code	Title	Hours
COLLEGE REQUIREMENTS		
Global Studies & Diversity Requirement		
MATHEMATICS REQUIREMENT		4
MATH 155	Calculus 1	
or MATH 153	Calculus 1a with Precalculus	
& MATH 154	and Calculus 1b with Precalculus	
SCIENCE REQUIREMENT fulfilled by major requirements		
Total Hours		4

Forensic Biology Major Requirements

Code	Title	Hours
STEM FOUNDATIONS *		**16**
CHEM 115	Fundamentals of Chemistry 1	
& 115L	and Fundamentals of Chemistry 1 Laboratory	
CHEM 116	Fundamentals of Chemistry 2	
& 116L	and Fundamentals of Chemistry 2 Laboratory	
PHYS 101	Introductory Physics 1	
& 101L	and Introductory Physics 1 Laboratory	
& PHYS 102	and Introductory Physics 2	
& PHYS 102L	and Introductory Physics 2 Laboratory	
or PHYS 111	General Physics 1	
& 111L	and General Physics 1 Laboratory	
& PHYS 112L	and General Physics 2 Laboratory	
& PHYS 112L	and General Physics 2 Laboratory	
QUANTITATIVE REQUIREMENT		**6**
MATH 156	Calculus 2	
& STAT 215	and Introduction to Probability and Statistics	
or STAT 211	Elementary Statistical Inference	
& STAT 312	and Intermediate Statistical Methods	
BIOLOGY, CHEMISTRY & BIOCHEMISTRY CORE		**37**

AGBI 410 & 410L	Introductory Biochemistry and Introduction to Biochemistry Laboratory	
or BIOC 339	Introduction to Human Biochemistry	
BIOL 115 & 115L	Principles of Biology and Principles of Biology Laboratory	
BIOL 117 & 117L	Introductory Physiology and Introductory Physiology Laboratory	
BIOL 219 & 219L	The Living Cell and The Living Cell Laboratory	
BIOL 310 & 310L	Advanced Cellular/Molecular Biology and Advanced Cellular/Molecular Biology Laboratory	
BIOL 324 & 324L	Molecular Genetics and Molecular Genetics Laboratory	
or GEN 371	Principles of Genetics	
CHEM 233 & 233L	Organic Chemistry 1 and Organic Chemistry 1 Laboratory	
CHEM 234 & 234L	Organic Chemistry 2 and Organic Chemistry 2 Laboratory	
FIS 432 & 432L	Forensic Biology and Forensic Biology Laboratory	
FORENSIC SCIENCE CORE		**20**
FIS 201	Introduction to Forensic Identification	
FIS 202	Crime Scene Investigation Overview	
FIS 305 & 305L	Biological Evidence and Biological Evidence Laboratory	
FIS 314 & 314L	Introduction to Microscopy and Introduction to Microscopy Laboratory	
FIS 385	Professional Internship Preparation	
FIS 386	Forensic Identification Internship	
FIS 404	Law and Evidence	
FIS 480	Forensic Quality Assurance	
UPPER-DIVISION ELECTIVES **		**6**
FIS 301 & 301L	Science/Technology of Fingerprint Identification and Science/Technology of Fingerprint Identification Laboratory ***	
FIS 320	Science and Culture of Illicit Drugs	
FIS 330	Principles of Forensic Photography	
FIS 407 & 407L	Gravesite Forensics and Gravesite Forensics Laboratory	
FIS 485	Professional Ethics in Forensic Science	
FIS 491	Professional Field Experience	
FIS 492	Directed Study	
FIS 495	Independent Study	
FIS 497	Research	
FIS 498	Honors	
CAPSTONE EXPERIENCE		**3**
FIS 406L	Capstone: Courtroom Testimony and Laboratory	
Total Hours		88

*****

STEM foundation courses are common to most STEM majors and excluded from the calculation of the percentage of upper-division courses

******

A maximum of 3 credits combined may come from FIS 492, 495, or 497. FIS 498C may not be used to fulfill this requirement.

****

FIS 301 is typically reserved for Forensic Examiner majors. If there is a seat available, it will be open to Forensic Biology majors as an option.

SUGGESTED PLAN OF STUDY

First Year

Fall	Hours	Spring	Hours
FIS 191	1	ENGL 101 (GEF 1)	3
BIOL 115 & 115L (B.S. First Area 1; GEF 2)	4	BIOL 117 & 117L (GEF 8; B.S. First Area 2)	4
CHEM 115 & 115L (GEF 8; B.S. Second Area 1)	4	CHEM 116 & 116L (GEF 8; B.S. Second Area 2)	4
FIS 201	3	MATH 156 (Math & Stats Elective 1)	4
MATH 155 (B.S. Math Requirement, GEF 3)	4		
	16		15

Second Year

Fall	Hours	Spring	Hours
BIOL 219 & 219L	4	ENGL 102 (GEF 1)	3
CHEM 233 & 233L	4	CHEM 234 & 234L	4
PHYS 101 & 101L (B.S. Third Area 1)	4	PHYS 102 & 102L (B.S. Third Area 2)	4
STAT 215 (Math and Stat Requirement 2)	3	FIS 202	3
		General Elective	1
	15		15

Third Year

Fall	Hours	Spring	Hours	Summer	Hours
GEF 4	3	FIS 432 & 432L	4	FIS 386	3-6
BIOL 310	3	BIOL 324 & 324L	4		
FIS 305 & 305L	3	GEF 5	3		
FIS 314 & 314L	3	General Elective	4		
FIS 385	1				
FIS 480	2				
	15		15		3

Fourth Year

Fall	Hours	Spring	Hours
FIS 404	2	AGBI 410 or BIOC 339	3
FIS 406L (Capstone)	3	Forensic Biology Elective 2	3
Forensic Biology Elective 1	3	GEF 7	3
GEF 6	3	General Elective	3
General Elective	3		
	14		12

Total credit hours: 120

Degree Progress

- All majors must meet with a FIS adviser each semester.
- By the start of the third regular semester (Fall or Spring) in the major, students must be enrolled in or have successfully completed and with a C-.
- Beyond the fifth regular semester, all students must maintain a minimum GPA of 2.5 in all courses applied to major requirements with a minimum grade requirement of C- in all courses applied to major requirements.
- If students do not begin upper-level FIS courses in their third year, they must complete the foundational courses listed below by the end of their sixth regular semester.
- Students who do not meet major benchmarks may be removed from the major.

UPPER LEVEL QUALIFICATION

During their first four semesters, students are expected to complete their foundational biology, chemistry, math, and physics courses. These fundamentals must be completed prior to taking upper-level FIS courses. Many of these courses will satisfy the GEF 1, 2, 3, 4, and 8 requirements, as well as the College B.S. requirements. Students interested in the forensic chemistry major are strongly encouraged to take PHYS 111 (http://catalog.wvu.edu/search/?P=PHYS%20111)/PHYS 112 (http://catalog.wvu.edu/search/?P=PHYS%20112) if they qualify.

To begin taking upper-level FIS courses, typically in the fifth semester/fall of the junior year, students must have completed the courses listed below with a grade of C- or better. If students are deficient in a single course requirement but can complete it in the fall semester, they may be permitted to enroll in upper-division FIS courses alongside the deficient course, based on availability of seats and compatibility of scheduling.

- BIOL 117 & BIOL 117L
- CHEM 234 & CHEM 234L
- MATH 154 or MATH 155 (Forensic Biology and Forensic Examiner) or MATH 156 (Forensic Chemistry)
- PHYS 102 & PHYS 102L or PHYS 112 & PHYS 112L
- STAT 215 or STAT 312

CALCULATION OF GPA

All students must maintain a minimum GPA of 2.5 in all courses applied to major requirements with a minimum grade requirement of C- in selected courses. Selected courses are: all courses applied to major requirements.

Major Learning Outcomes

FORENSIC BIOLOGY

Upon graduation from the Forensic Biology major, students will be able to:

1. Apply scientific methodology and evaluate techniques in the collection, processing, analysis, and evaluation of forensic evidence.
2. Assess and defend data generated during forensic investigations
3. Present scientific data in written, verbal, and visual formats.
4. Demonstrate the professionalism and high ethical standards demanded by the justice system and the forensic science community.