Forensic Chemistry, 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

- Luis Arroyo - Ph.D. (Florida International University)
  Regular Graduate Faculty, Toxicology, Environmental Forensics
- 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
- Tatiana Trejos - Ph.D. (Florida International University)
  Regular Graduate Faculty, Trace Evidence, Elemental Analysis

ASSISTANT PROFESSORS

- 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

Admissions for 2026-2027

- 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 directly to the major. A minimum ALEKS score of 45 is recommended for the timely completion of the degree.
- Students transferring from another WVU major or from another institution with fewer than 24 credits and at least a 2.0 overall GPA must meet the following requirements: MATH ACT of 22 or a MATH SAT of 540 or a 3.75 cumulative high school GPA.
- Students transferring from another WVU major or from another institution with 24 hours or more and at least a 2.0 overall GPA must meet the following requirement prior to being admitted to the major: CHEM 115 (http://catalog.wvu.edu/search/?P=CHEM%20115) or higher with a C-.

Major Code 14C6

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.

Departmental Requirements for the B.S. in Forensic Chemistry

Students must complete WVU General Education Foundations requirements, Eberly Edge Program requirements, major requirements, and electives to total a minimum of 120 hours.

- **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.
- **Writing and Communication Skills Requirement**: The Forensic Chemistry 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.
- **Capstone Requirement:** The university requires the successful completion of a Capstone course. Forensic Chemistry majors must complete FIS 406L.
- **Internship Requirement**: All students are required to successfully complete the FIS 386 internship course for a minimum of 3 hours of credit.

Curriculum Requirements

Code	Title	Hours
University Requirements		24
Eberly Edge Requirements		9
Forensic Chemistry Major Requirements		87
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		5
Total Hours		24

Eberly Edge Program Requirements

Code	Title	Hours
EDG 1 : Data and Society		3
EDG 2 : Effective and Civil Communication (FIS 406L)		
EDG 3 :Ethics and Civil Responsibility (FIS 485)		
EDG 4: Global and Regional Perspectives		3
EDG 5 : Practicing Arts & Sciences (ARSC 380)		3
EDG 6 : EEDG High Impact Experience (FIS 386)		
Total Hours		9

Forensic Chemistry Major Requirements

Code	Title	Hours
STEM FOUNDATIONS *		**27**
BIOL 115 & 115L	Principles of Biology and Principles of Biology Laboratory	
BIOL 117 & 117L	Introductory Physiology and Introductory Physiology Laboratory	
MATH 155	Calculus 1	
MATH 156	Calculus 2	
PHYS 101 & 101L & PHYS 102 & PHYS 102L	Introductory Physics 1 and Introductory Physics 1 Laboratory and Introductory Physics 2 and Introductory Physics 2 Laboratory	
or PHYS 111 & 111L & PHYS 112 & PHYS 112L	General Physics 1 and General Physics 1 Laboratory and General Physics 2 and General Physics 2 Laboratory	
STAT 215	Introduction to Probability and Statistics	
CORE CHEMISTRY COURSES		**24**
CHEM 115 & 115L	Fundamentals of Chemistry 1 and Fundamentals of Chemistry 1 Laboratory	
CHEM 116 & 116L	Fundamentals of Chemistry 2 and Fundamentals of Chemistry 2 Laboratory	
CHEM 215 & 215L	Introductory Analytical Chemistry and Introductory Analytical Chemistry Laboratory	
CHEM 233 & 233L	Organic Chemistry 1 and Organic Chemistry 1 Laboratory	

CHEM 234 & 234L	Organic Chemistry 2 and Organic Chemistry 2 Laboratory	
CHEM 341 & 341L	Physical Chemistry: Brief Course and Physical Chemistry: Brief Course Laboratory	
or CHEM 348 & 348L	Physical Chemistry 2 and Physical Chemistry 2 Laboratory	
CORE FORENSIC AND INVESTIGATIVE SCIENCE COURSES		**29**
FIS 201	Introduction to Forensic Identification	
FIS 202	Crime Scene Investigation Overview	
FIS 314 & 314L	Introduction to Microscopy and Introduction to Microscopy Laboratory	
FIS 340 & 340L	Forensic Chemical Analysis and Forensic Chemical Analysis Laboratory	
FIS 385	Professional Internship Preparation	
FIS 386	Forensic Identification Internship	
FIS 404	Law and Evidence	
FIS 460 & 460L	Analysis of Seized Drugs and Analysis of Seized Drugs Laboratory	
FIS 480	Forensic Quality Assurance	
FIS 485	Professional Ethics in Forensic Science	
UPPER-DIVISION ELECTIVES		**4**
Select two of the following sequences:		
FIS 414 & 414L	Trace Evidence Examination and Trace Evidence Examination Laboratory	
FIS 451 & 451L	Arson and Explosives Analysis and Arson and Explosives Analysis Laboratory	
FIS 470 & 470L	Analytical Forensic Toxicology and Analytical Forensic Toxicology Laboratory	
CAPSTONE EXPERIENCE		**3**
FIS 406L	Capstone: Courtroom Testimony and Laboratory	
Total Hours		87

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

SUGGESTED PLAN OF STUDY

First Year

Fall	Hours	Spring	Hours
FIS 191	1	BIOL 117 & 117L (GEF 8 course 2)	4
BIOL 115 & 115L (GEF 2)	4	CHEM 116 & 116L (GEF 8 course 3)	4
CHEM 115 & 115L (GEF 8 course 1)	4	General Elective	3
FIS 201	3	MATH 156	4
MATH 155 (GEF 3)	4	EDG 4: Global and Regional Perspectives	3
	16		18

Second Year

Fall	Hours	Spring	Hours
CHEM 233 & 233L	4	ENGL 102 (GEF 1 course 2)	3

ENGL 101 (GEF 1 course 1)	3	CHEM 234 & 234L	4
PHYS 101 & 101L	4	FIS 202	3
STAT 215	3	PHYS 102 & 102L	4
EDG 1: Data and Society	3		
	17		14

Third Year

Fall	Hours	Spring	Hours	Summer	Hours
CHEM 215 & 215L	4	ARSC 380 (EDG 5)	3	FIS 386 (EDG 6)	3
FIS 314 & 314L	3	CHEM 341 & 341L	4		
FIS 340 & 340L	4	FIS 460 & 460L	4		
FIS 385	1	GEF 4	3		
FIS 480	2				
	14		14		3

Fourth Year

Fall	Hours	Spring	Hours
FIS 404	3	FIS 485 (EDG 3)	3
FIS 406L (EDG 2)	3	FIS Chemistry Elective	4
GEF 5	3	GEF 7	3
GEF 6	3	General Elective	2
	12		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 CHEMISTRY

Upon graduation from the Forensic Chemistry 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.