FORENSIC SCIENCE, BACHELOR OF SCIENCE (B.S.) WITH A CONCENTRATION IN FORENSIC BIOLOGY

The forensic biology concentration requires an additional 24 credits in biology, forensic science and elective credits beyond the core requirements and is well-suited for students interested in graduate study or careers in the forensic biology section of forensic laboratories. Students also will be prepared for work in molecular biology laboratories in both the public and private sectors. Students completing the forensic biology concentration will be eligible for a minor in chemistry. Additionally, students who complete BIOL 317 or BIOL 318 will be eligible for a minor in biology.

Student learning outcomes

Upon completing this program, students will know how to do the following:

Forensic science core outcomes

- Demonstrate a basic understanding of the laws of criminal procedure and rules of evidence
- · Demonstrate proper crime scene investigation and reconstruction
- Demonstrate ethical and professional duties and responsibilities of the forensic scientist
- Apply basic principles, theory and laboratory procedures of biology, chemistry and physics to forensic science

Forensic biology concentration-specific outcomes

• Demonstrate knowledge, capabilities, use and limitations of forensic biology laboratory techniques

Special requirements

The forensic science program requires a minimum of 120 credits including completion of the general education requirements (see more information below), 34 forensic science core program credits and 24 concentration-specific credits.

For the forensic biology concentration, a minimum of five elective credit hours of advanced biology, chemistry and/or forensic science course work (with lab, at the 300- to 500-level) must be taken.

All of the general education foundation courses will be automatically fulfilled through this degree by taking the following required courses: UNIV 111, UNIV 112, UNIV 200 and MATH 200 (13 credits).

Students will need to take a total of 17 credits from areas of inquiry (including nine credits from breadth of knowledge). Some of these general education areas of inquiry and breadth of knowledge requirements will also be automatically fulfilled through this degree by taking the following required courses: CHEM 101 (three credits) satisfies the breadth of knowledge for natural sciences and area of inquiry for scientific and logical reasoning; and either PHYS 201 or 207 (four to five credits) satisfies area of inquiry for scientific and logical reasoning.

In addition to these required courses, students will need to select at least three additional general education courses from the remaining areas of

inquiry. Three credits are required from each of the following areas of inquiry (nine credits total): diversities in the human experience; creativity, innovation and aesthetic inquiry; and global perspectives. Two of the selected general education courses should also fulfill the breadth of knowledge requirement from the areas of humanities/fine arts and social/behavioral sciences.

Degree requirements for Forensic Science, Bachelor of Science (B.S.) with a forensic biology concentration

Course	Tit	le	Hours
General education (https://bulletin.vcu.edu/undergraduate/ undergraduate-study/general-education-curriculum/)			
Select 30 cre with an advis	edits of gene ser.	ral education courses in consultation	30
Major require	ements		
Major core	requirement	s ¹	
BIOL 152 & BIOZ 152	Int an La	roduction to Biological Sciences II d Introduction to Biological Science boratory II	4
BIOZ 151	Int La	roduction to Biological Science boratory I	1
CHEM 102 & CHEZ 102	Ge an	neral Chemistry II d General Chemistry Laboratory II	4
CHEM 301 & CHEZ 301	Or an	ganic Chemistry d Organic Chemistry Laboratory I	5
CHEM 302 & CHEZ 302	Or an	ganic Chemistry d Organic Chemistry Laboratory II	5
FRSC 300	Su	rvey of Forensic Science	3
FRSC 309	Sc	ientific Crime Scene Investigation	3
FRSC 365	Fo	rensic Microscopy	3
FRSC 375	Fo Pre	rensic Evidence, Law and Criminal ocedure	3
FRSC 490	Pro	ofessional Practices in Forensic ience	3
• Additional r	major require	ements ¹	
FRSC electiv	es (any 300-	500 level course)	6
PHYS 202	Ge	neral Physics II	4-5
or PHYS 2	.08 Un	iversity Physics II	
Concentrat	ion requirem	ents ¹	
BIOL 300	Ce	llular and Molecular Biology	3
BIOL 310	Ge	netics	3
BIOZ 476	Mo	blecular Biology Laboratory	2
CHEM 403	Bio	ochemistry I	3
FRSC 385	Fo	rensic Serology	3
FRSC/BIOL 4	138 Fo	rensic Molecular Biology	3
FRSZ/BIOL 4	138 Fo	rensic Molecular Biology Laboratory	2
Concentratio	on electives		
Select five cr aboratory fro courses:	edits from 3 om BIOL/BIC	00- to 500-level courses with a)Z, CHEM/CHEZ or these FRSC/FRSZ	5
FRSC 400	Fo	rensic Chemistry	
FRSC 445	Fo	rensic Toxicology and Drugs	
FRSC 505	Fo	rensic Entomology	

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FRSC 510	Developmental Osteology	
FRSC 515	Forensic Anthropology Applications	
Ancillary requirement	s	
BIOL 151	Introduction to Biological Sciences I ¹	3
CHEM 101 & CHEZ 101	General Chemistry I and General Chemistry Laboratory I (CHEM 101 satisfies general education BOK for natural sciences and AOI for scientific and logical reasoning) ¹	4
HUMS 202	Choices in a Consumer Society	1
MATH 200	Calculus with Analytic Geometry I (satisfies general education quantitative foundations)	4
PHYS 201	General Physics I (either satisfies general education AOI for scientific and logical reasoning) ¹	4-5
STAT 210	Basic Practice of Statistics	3
Experiential fine arts	2	1-3
Foreign language thro placement)	bugh the 102 level (by course or	0-6
Open electives		
Select any course.		4-14
Total Hours		120

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Students must receive a minimum grade of C in these courses, including concentration electives. If a course is a prerequisite for another course, a minimum grade of C must be obtained in the prerequisite course before proceeding to the subsequent course.

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Course offered by the School of the Arts

The minimum number of credit hours required for this degree is 120.

What follows is a sample plan that meets the prescribed requirements within a four-year course of study at VCU. Please contact your adviser before beginning course work toward a degree.

Recommended course sequence/plan of study

Note: This plan of study assumes that the student:

- · Scored well enough on the VCU Mathematics Placement Test to place into MATH 200 or that the student has completed MATH 151 with a minimum grade of C (a pre- or corequisite for BIOL 151, BIOZ 151 and CHEM 101; a prerequisite for CHEM 102).
- · Scored well enough on the chemistry placement exam/assessment or has successfully completed CHEM 100 with a minimum grade of B (a prerequisite for CHEM 101).

Freshman year

	Hours
Introduction to Biological Sciences I ¹	4
and Introduction to Biological Science Laboratory I ¹	
	Introduction to Biological Sciences I ¹ and Introduction to Biological Science Laboratory I ¹

CHEM 101 & CHEZ 101	General Chemistry I ¹ and General Chemistry Laboratory I (CHEM 101 satisfies general education BOK for natural sciences and AOI for scientific and logical reasoning) ¹	4
UNIV 111 Play course video for Introduction to Focused Inquiry: Investigation and Communicatio	Introduction to Focused Inquiry: Investigation and Communication (satisfies general education UNIV foundations) ¹ on	3
General educa	ation course ²	3
	Term Hours:	14
Spring semes	ter	
BIOL 152 & BIOZ 152	Introduction to Biological Sciences II and Introduction to Biological Science Laboratory II	4
CHEM 102	General Chemistry II	4
& CHEZ 102	and General Chemistry Laboratory II	1
	Coloulus with Apolytic Coometry I	1
MATH 200	(satisfies general education quantitative foundations)	4
UNIV 112 Play course video for Focused Inquiry II	Focused Inquiry II (satisfies general education UNIV foundations) ¹	3
	Term Hours:	16
Sophomore y	ear	
Fall semester		
BIOL 300	Cellular and Molecular Biology	3
CHEM 301 & CHEZ 301	Organic Chemistry ' and Organic Chemistry Laboratory I ¹	5
STAT 210	Basic Practice of Statistics	3
UNIV 200	Advanced Focused Inquiry: Literacies, Research and Communication (satisfies general education UNIV foundations) ¹	3
Experiential fi	ne arts	1-3
	Term Hours:	15-17
Spring semes	ter	
CHEM 302 & CHEZ 302	Organic Chemistry and Organic Chemistry Laboratory II	5
FRSC 300	Survey of Forensic Science	3
FRSC 375	Forensic Evidence, Law and Criminal Procedure	3
General educa	ation course ²	3
	Term Hours:	14
Junior year		
Fall semester		
BIOL 310	Genetics	3
FRSC 309	Scientific Crime Scene Investigation	3

PHYS 201	General Physics I (either satisfies general	4-5
Or DUVC 207	education AOI for scientific and logical	
PH15 207	or University Physics I	
Foreign langu	age 101 (or open elective)	3
General educa	ation course 2	3
	Term Hours:	16-17
Spring semes	ter	
BIOZ 476	Molecular Biology Laboratory	2
FRSC 365	Forensic Microscopy	3
PHYS 202	General Physics II	4-5
or	or University Physics II	
PHYS 208		
Foreign language 102 (or open elective)		3
Open elective		2
	Term Hours:	14-15
Senior year		
Fall semester		
CHEM 403	Biochemistry I	3
FRSC 385	Forensic Serology	3
FRSC 490	Professional Practices in Forensic Science	3
BIOL/BIOZ, CH 500-level)	IEM/CHEZ or FRSC/FRSZ (with lab, 300- to	3
FRSC elective		3
	Term Hours:	15
Spring semes	ter	
FRSC 438	Forensic Molecular Biology	5
& FRSZ 438	and Forensic Molecular Biology Laboratory	
BIOL/BIOZ, CH 500-level)	IEM/CHEZ or FRSC/FRSZ (with lab, 300- to	2
FRSC elective		3
Open electives	S	6
	Term Hours:	16
	Total Hours:	120-124

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There is little, if any, flexibility regarding when to take these courses in order to enroll in FRSC 300 during spring semester of sophomore year.

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At least three additional general education courses (nine credits) are required. Three credits come from each of the following areas of inquiry: diversities in the human experience; creativity, innovation and aesthetic inquiry; and global perspectives. The latter two areas of inquiry courses should also fulfill the breadth of knowledge requirement from the areas of humanities/fine arts and social/behavioral sciences.

The minimum number of credit hours required for this degree is 120.

Accelerated B.S. and M.S.

The accelerated B.S. and M.S. program allows academically talented students to earn both the B.S. and M.S. in Forensic Science in a minimum of five and a half years by completing approved graduate courses during the senior year of their undergraduate program. Students in the program may count up to 12 hours of graduate courses toward both the B.S. and M.S. degrees. Thus, the two degrees may be earned with a minimum of

150 credits rather than the 162 credits necessary if the two degrees are pursued separately.

Students holding these degrees will have advanced training in forensic science through a combination of laboratory and classroom work and will gain important professional development skills. The goal of the accelerated program is to significantly enhance the student's qualifications to pursue a career in the forensic science field. Alternatively, students who distinguish themselves may be able to pursue advanced study in doctoral or professional programs on an accelerated timetable.

Entrance to the accelerated program

Interested undergraduate students should consult with their adviser as early as possible to receive specific information about the accelerated program, determine academic eligibility and submit (no later than two semesters prior to graduating with a baccalaureate degree, that is, before the end of the spring semester of their junior year) an Accelerated Program Declaration Form to be approved by the graduate program director. Limited spaces may be available in the accelerated program. Academically qualified students may not receive approval if capacity has been reached.

Minimum qualifications for entrance to this accelerated program include completion of 60 undergraduate credit hours including CHEM 301, CHEZ 301, FRSC 300 and an overall GPA of 3.3. Two reference letters (at least one from a forensic science faculty member) must accompany the Accelerated Program Declaration Form.

Once enrolled in the accelerated program, students must meet the standards of performance applicable to graduate students as described in the "Satisfactory academic progress (https://bulletin.vcu.edu/academic-regs/grad/satisfactory-academic-progress/)" section of Bulletin, including maintaining a 3.0 GPA. Guidance to students in an accelerated program is provided by both the undergraduate forensic science adviser and the forensic science graduate program director.

Admission to the graduate program

Entrance to the accelerated program enables the student to take the approved shared courses that will apply to the undergraduate and graduate degrees. However, entry into an accelerated program via an approved Accelerated Program Declaration Form does not constitute application or admission into the graduate program. Admission to the graduate program requires a separate step that occurs through a formal application. In order to continue pursuing the master's degree after the baccalaureate degree is conferred, accelerated students must follow the admission to graduate study requirements outlined in the VCU Bulletin.

Degree requirements

The Bachelor of Science in Forensic Science degree will be awarded upon completion of a minimum of 120 credits and the satisfactory completion of all undergraduate degree requirements as stated in the Undergraduate Bulletin.

A maximum of 12 graduate credits may be taken prior to completion of the baccalaureate degree. These graduate credits substitute for required major courses or electives for the undergraduate degree. These courses are shared credits with the graduate program, meaning that they will be applied to both undergraduate and graduate degree requirements.

The graduate forensic science courses that may be taken as an undergraduate, once a student is admitted to the program, are listed below. The specific courses to be taken (maximum of 12 credit hours) will be decided through advising and based on the student's undergraduate concentration and chosen graduate concentration in forensic science.

Course	Title	Hours
FRSC 565	Scientific Crime Scene Investigation (satisfies FRSC 309)	3
FRSC 581	Forensic Analysis of Fire Debris and Explosive Evidence (satisfies FRSC elective)	3
FRSC 582	Forensic Analysis of Paint and Fiber Evidence (satisfies FRSC elective)	3
FRSC 644	Analytical Considerations in Forensic Toxicology (satisfies FRSC elective)	3
FRSC 670	Forensic Evidence and Criminal Procedure (satisfies FRSC 375)	3
FRSC 673 & FRSZ 673	Forensic Microscopy and Forensic Microscopy Laboratory (satisfies FRSC 365)	3
FRSC 677	Professional Practices and Expert Testimony (satisfies FRSC 490)	3

Recommended course sequence/plan of study

What follows is the recommended plan of study for students interested in the accelerated program beginning in the fall of the junior year prior to admission to the accelerated program in the senior year.

Course	Title	Hours
Junior year		
Fall semester		
PHYS 201	General Physics I	4-5
or PHYS 207	University Physics I	
Concentration require	ements	3
Open electives and/o	r general education	9
Term Hours:		16
Spring semester		
PHYS 202	General Physics II	4-5
or PHYS 208	University Physics II	
Concentration require	ements	7
Open electives and/o	r general education	4
Term Hours:		15
Senior year		
Fall semester		
FRSC 670	Forensic Evidence and Criminal Procedure	3
FRSC 673 & FRSZ 673	Forensic Microscopy and Forensic Microscopy Laboratory	3
Concentration require	ements	6
Open elective		3
Term Hours:		15
Spring semester		
FRSC 565	Scientific Crime Scene Investigation	3
FRSC 677	Professional Practices and Expert Testimony	3
Concentration require	ements	4
Open electives		4

Term Hours:		14
Fifth year		
Fall semester		
FRSC 570	Forensic Science Seminar	1
FRSC 671	Instrumentation in Forensic Chemistry	2
FRSC 675	Forensic Serology and DNA Analysis	2
FRSZ 671	Instrumentation in Forensic Chemistry Laboratory ¹	1
or FRSZ 675	Forensic Serology and DNA Analysis Laboratory	/
STAT 543	Statistical Methods I ¹	3
or FRSC 580	Applied Statistics for Forensic Science	
Term Hours:		9
Spring semester		
FRSC 570	Forensic Science Seminar	1
FRSC 660	Toolmark Examinations	3
or FRSC 661	Analysis of Pattern Evidence	
or FRSC 662	Firearm Identification	
FRSC 793	Directed Research in Forensic Science	1
Concentration require	ements	6
Term Hours:		11
Sixth year		
Fall semester		
FRSC 570	Forensic Science Seminar	1
FRSC 793	Directed Research in Forensic Science	2
Concentration require	ements	7
Term Hours:		10
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Course selection depends on concentration; see adviser for confirmation of correct choice.