

FORENSIC SCIENCE, MASTER OF SCIENCE (M.S.) WITH A CONCENTRATION IN FORENSIC CHEMISTRY/TRACE

Program accreditation

Forensic Science Education Programs Accreditation Commission

Program goal

The Master of Science in Forensic Science is one of only a few of its kind in the U.S. The mission of the program is to prepare students for careers as forensic scientists in government and private forensic laboratories. In addition, students will be prepared to pursue further graduate and/or professional academic degrees.

Core courses in the forensic science curriculum offer broad exposure to forensic laboratory equipment and instrumentation, as well as legal issues, expert testimony, forensic biology, forensic chemistry, trace evidence, physical evidence, professional ethics, quality assurance and current topics in research and development within the forensic sciences. Concentrations offered include forensic biology, forensic chemistry/drugs and toxicology, forensic chemistry/trace and forensic physical analysis. A strong emphasis is placed on laboratory course work, providing students with significant laboratory and research experience. Several of the laboratory courses are taught by practicing professional forensic scientists at the Virginia Division of Forensic Science Central Laboratory, which is nationally accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board.

Student learning outcomes

1. Students will be able to apply basic principles and laboratory procedures of biology and chemistry to forensic science through focused study in the available concentration options.
2. Students will demonstrate capabilities, use, potential and limitations of forensic laboratory theory and techniques.
3. Students will demonstrate the ability to perform (report and orally present) independent research in an area of forensic science.
4. Students will demonstrate an understanding of legal procedure, rules of evidence, ethical and professional duties and responsibilities of the forensic scientist.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (<http://www.graduate.vcu.edu/>) and academic regulations in individual school and department publications and

on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the **academic regulations section for additional information on academic regulations for graduate students.** (<http://bulletin.vcu.edu/academic-regs/>)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the **academic regulations section for additional information on degree candidacy requirements.** (<http://bulletin.vcu.edu/academic-regs/grad/candidacy/>)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the **academic regulations section for additional information on graduation requirements.** (<http://bulletin.vcu.edu/academic-regs/grad/graduation-info/>)

Apply online today. (<https://www.vcu.edu/admissions/apply/graduate/>)

Admission requirements

| Degree: | Semester(s) of entry: | Deadline dates: | Test requirements: |
|---------|-----------------------|-----------------|--------------------|
| M.S. | Fall | Mar 1 | |

Note: Review of application and offers of admission will begin Jan. 15 and proceed until enrollment openings are filled. All applicants are automatically considered for graduate teaching assistantships in the Department of Forensic Science; however, the earlier a student's application is complete, the better the chance of being selected for an assistantship.

In addition to the general admission requirements of the VCU Graduate School (http://www.pubapps.vcu.edu/Bulletins/prog_search/?uid=10045&iid=30033&did=20062), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in a natural science discipline, including forensic science, or a degree with equivalent course work

- An undergraduate GPA that exceeds 2.9 on a 4.0 scale (Most students entering the forensic science graduate program have a minimum GPA of 3.0 on undergraduate work.)
- Completion of eight credit hours (two semesters or equivalent) of organic chemistry with laboratories and eight credit hours (two semesters or equivalent) of general biology with laboratories
- Assessment of prior graduate course work and/or relevant laboratory experience (where applicable)
- Three letters of recommendation pertaining specifically to the student's potential ability as a graduate student in forensic science
- Personal statement

Applicants are required to select a concentration and will be considered only for that concentration. If course work deficiencies are identified, students may be required to take additional foundational courses beyond those required for the concentration.

Additional admission requirements for concentration in forensic chemistry/trace

In addition to the M.S. in Forensic Science general admission requirements, applicants to the forensic chemistry/trace concentration must have completed a minimum of nine semester credit hours or equivalent of upper-level chemistry course work. This may include, but is not limited to, course work in physical chemistry, instrumental analysis, quantitative analysis and/or inorganic chemistry.

Degree requirements

The graduate program is a full-time, two-year program. Courses will vary depending on the concentration selected. Required and elective courses are offered at various times, day and night, throughout the week. The M.S. in Forensic Science requires 42 graduate credit hours of course work, including 26 credit hours of required core course work and 16 credit hours of specialized course work designed for each concentration (including electives). The required course work includes a directed research project, which is an extensive research experience conducted within a forensic laboratory setting.

In addition to general VCU Graduate School graduation requirements (<http://bulletin.vcu.edu/academic-regs/grad/graduation-info/>), students are required to complete course work in core and elective courses and to conduct significant research.

- Credit hour requirements: Students must complete a minimum of 42 graduate-level credit hours as outlined in the list of core and concentration requirements, including electives.
- Grade requirements: Students must maintain an ongoing, cumulative minimum GPA of 3.0. Receipt of a grade of C in two or more courses will constitute an automatic dismissal from the graduate program in forensic science. Receipt of a grade of D or lower in any one course will constitute an automatic dismissal from the graduate program in forensic science.
- Other requirements: Students must maintain continuous, full-time enrollment. Interruption in continuous enrollment or full-time status for any reason without a leave of absence approved by the forensic science graduate committee will require that students reapply to the program. Request for credit for graduate course work taken at other institutions must be submitted to the director of graduate studies in forensic science and will be considered on a case-by-case basis by the forensic science graduate committee. If course work deficiencies are identified, students may be required to take additional

foundational courses beyond those listed below. These will not count toward the 42 required credit hours.

Curriculum requirements

| Course | Title | Hours |
|--|---|-------|
| FRSC 570 | Forensic Science Seminar (once-credit course repeated for three credits) ^{1,2} | 3 |
| FRSC 661 or FRSC 662 or FRSC 660 | Analysis of Pattern Evidence ³ Firearm Identification Toolmark Examinations | 3 |
| FRSC 670 | Forensic Evidence and Criminal Procedure | 3 |
| FRSC 671 & FRSZ 671 | Instrumentation in Forensic Chemistry and Instrumentation in Forensic Chemistry Laboratory ² | 3 |
| FRSC 673 & FRSZ 673 | Forensic Microscopy and Forensic Microscopy Laboratory ² | 3 |
| FRSC 675 | Forensic Serology and DNA Analysis ² | 2 |
| FRSC 677 | Professional Practices and Expert Testimony | 3 |
| FRSC 793 | Directed Research in Forensic Science | 3 |
| STAT 543 or FRSC 580 or BIOS 543 | Statistical Methods I Applied Statistics for Forensic Science Graduate Research Methods I | 3 |
| Forensic chemistry/trace concentration courses | | |
| FRSC 565 | Scientific Crime Scene Investigation ³ | 3 |
| FRSC 581 | Forensic Analysis of Fire Debris and Explosive Evidence | 3 |
| FRSC 582 | Forensic Analysis of Paint and Fiber Evidence | 3 |
| Recommended electives | | |
| Select seven credit hours of the following: ⁴ | | 7 |
| CHEM 506 | Introduction to Spectroscopic Methods in Organic Chemistry | |
| CHEM 606 | Advanced Spectroscopic Methods in Organic Chemistry | |
| CHEM 630 | Electroanalytical Chemistry | |
| CHEM 631 | Separation Science | |
| CHEM 632 | Chemometrics | |
| CHEM 633 | Mass Spectrometry | |
| CHEM 634 | Surface Science | |
| CHEM 635 | Spectrochemical Analysis | |
| FRSC 510 | Developmental Osteology ³ | |
| FRSC 520 | Forensic Fire Investigation | |
| FRSC 566 | Advanced Crime Scene Investigation ³ | |
| FRSC 580 | Applied Statistics for Forensic Science | |
| FRSC 591 | Topics in Forensic Science | |
| FRSC 607 | Forensic Taphonomy ³ | |
| FRSC 644 | Analytical Considerations in Forensic Toxicology | |
| FRSC 645 | Applications in Forensic Toxicology ³ | |
| FRSC 660 | Toolmark Examinations ³ | |
| FRSC 661 | Analysis of Pattern Evidence ³ | |
| FRSC 662 | Firearm Identification ³ | |

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|--------------------|---------------------------------------|
| FRSC 672 | Advanced Drug Analysis ³ |
| FRSC 690 | Scientific Writing |
| FRSC 692 | Forensic Science Independent Study |
| FRSC 693 | Current Topics in Forensic Science |
| FRSC 792 | Research Techniques |
| FRSC 793 | Directed Research in Forensic Science |
| Total Hours | 42 |

1

FRSC 690 may substitute for one credit of this requirement.

2

Courses required during the first fall semester upon entry in to the program

3

Course consists of lecture and laboratory.

4

In consultation with adviser. At least one elective must be a graduate-level chemistry course.

The minimum number of graduate credit hours required for this degree is 42.

Accelerated opportunities

The department offers opportunities for qualified undergraduate students to earn both an undergraduate and graduate degree in a minimum of five years by completing approved graduate courses during the senior year of their undergraduate program. See the individual program page in the Undergraduate Bulletin (<http://bulletin.vcu.edu/undergraduate/college-humanities-sciences/forensic-science/forensic-science-bs-concentration-forensic-chemistry/>) for details.

Contact

Sarah Seashols Williams, Ph.D.
 Assistant professor and graduate program director
sseashols@vcu.edu
 (804) 827-8597

Program website: forensicscience.vcu.edu (<http://forensicscience.vcu.edu/>)