FORENSIC SCIENCE, BS

Banner Code: SC-BS-FRSC

Academic Advising

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Fairfax Campus
Phone: 703-993-5071
Email: fscience@gmu.edu
Website: science.gmu.edu/academics/departments-units/forensic-science

The Bachelor of Science in Forensic Science is a general forensic science degree that covers various fields within forensic science including field and laboratory applications. These topics include areas such as crime scene investigation, forensic DNA, forensic chemistry, trace evidence, firearms examination, questioned document, fingerprints, arson, and drug analysis.

This degree is intended to provide students with a well-rounded, hands-on forensic science education in order to prepare students for entrance into a graduate-level educational program, and/or entry-level professional careers in public and private forensic laboratories, federal, state, or local government/law enforcement, defense, homeland security and intelligence agencies.

The Forensic Science undergraduate program provides a strong scientific foundation while simultaneously enabling students to individualize their educational experience toward specific career goals or post-graduate degrees by taking specialized forensic science and natural science courses. This degree offers concentrations in Forensic Biology and Forensic Chemistry to prepare students who desire a career within these specialties.

Unique features of this program include an innovative curriculum that offers hands-on training with crime scene techniques and crime laboratory methodologies, an outdoor forensic excavation research and training facility, and courses taught by professional and distinguished faculty from various forensic agencies and laboratories.

Admissions & Policies

Admissions

University-wide admissions policies can be found in the Undergraduate Admissions Policies (http://catalog.gmu.edu/admissions/undergraduate-policies/) section of this catalog.

To apply for this program, please complete the George Mason University Admissions Application (https://www2.gmu.edu/admissions-aid/apply-now/).

Policies

Students must fulfill all Requirements for Bachelor's Degrees (http://catalog.gmu.edu/policies/academic/undergraduate-policies/#ap-5-3-2), including the Mason Core (http://catalog.gmu.edu/mason-core/).

FRSC 302 Forensic Trace Analysis and FRSC 304 Forensic Chemistry will satisfy the writing intensive requirement.

For policies governing all undergraduate programs, see AP5 Undergraduate Policies (http://catalog.gmu.edu/policies/academic/undergraduate-policies/).

Requirements

Degree Requirements

Total credits: minimum 120

Students should refer to the Admissions & Policies tab for specific policies related to this program.

Students majoring in forensic science must complete the core courses and choose one concentration. Students cannot declare the concentration upon admission; it can be declared once the student has earned a minimum of 60 credits.

All coursework must be completed with a minimum GPA of 2.30. No more than three courses with a grade of 'D' (1.00) may be applied to the major.

Students are advised to be aware of any prerequisites that may be required for each course in the curriculum.

Students are only permitted three attempts for all major courses; following a third unsuccessful attempt the student will no longer be able to pursue the major.

Forensic Science Core Courses

Students in each concentration should complete the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>FRSC 200</td>
<td>Survey of Forensic Science</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 201</td>
<td>Introduction to Criminalistics</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 302</td>
<td>Forensic Trace Analysis</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 303</td>
<td>Forensic Evidence and Ethics</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 304  &amp; FRSC 305</td>
<td>Forensic Chemistry and Forensic Chemistry Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>FRSC 401</td>
<td>Crime Scene Investigations</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 405</td>
<td>Independent Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>or FRSC 406</td>
<td>Forensic Internship</td>
<td></td>
</tr>
<tr>
<td>FRSC 460  &amp; FRSC 461</td>
<td>Forensic DNA Analysis and Forensic DNA Analysis Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>FRSC 499</td>
<td>Comprehensive Examination</td>
<td>0</td>
</tr>
<tr>
<td>CRIM 100</td>
<td>Introduction to Criminal Justice (Mason Core)</td>
<td>3</td>
</tr>
</tbody>
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Natural Science Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOL 213</td>
<td>Cell Structure and Function (Mason Core)</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 214</td>
<td>Biostatistics for Biology Majors</td>
<td>3-4</td>
</tr>
<tr>
<td>or STAT 250</td>
<td>Introductory Statistics I (Mason Core)</td>
<td></td>
</tr>
<tr>
<td>BIOL 311</td>
<td>General Genetics</td>
<td>4</td>
</tr>
</tbody>
</table>
CHEM 211 & CHEM 213  General Chemistry I (Mason Core) (http://catalog.gmu.edu/mason-core/) and General Chemistry Laboratory I (Mason Core) (http://catalog.gmu.edu/mason-core/)  4

CHEM 212 & CHEM 214  General Chemistry II (Mason Core) (http://catalog.gmu.edu/mason-core/) and General Chemistry Laboratory II (Mason Core) (http://catalog.gmu.edu/mason-core/)  4

CHEM 313 & CHEM 315  Organic Chemistry I and Organic Chemistry Lab I  5

CHEM 314 & CHEM 318  Organic Chemistry II and Organic Chemistry Lab II  5

MATH 113 or MATH 123 & MATH 124  Analytic Geometry and Calculus I (Mason Core) (http://catalog.gmu.edu/mason-core/) and Calculus with Algebra/Trigonometry, Part A and Calculus with Algebra/Trigonometry, Part B (Mason Core) (http://catalog.gmu.edu/mason-core/)  4-6

PHYS 243 & PHYS 244  College Physics I (Mason Core) (http://catalog.gmu.edu/mason-core/) and College Physics I Lab (Mason Core) (http://catalog.gmu.edu/mason-core/)  4

PHYS 245 & PHYS 246  College Physics II (Mason Core) (http://catalog.gmu.edu/mason-core/) and College Physics II Lab (Mason Core) (http://catalog.gmu.edu/mason-core/)  4

Total Credits  70-73

FRSC 302 and FRSC 304 will satisfy this major’s writing-intensive requirement.

Students in the Forensic Chemistry Concentration may instead choose the following physics sequence:

PHYS 160 & PHYS 161 & PHYS 260 & PHYS 261

• Please note that PHYS 260/261 requires a prerequisite of MATH 213.

Degree without Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOL 430</td>
<td>Advanced Human Anatomy and Physiology I</td>
<td>4</td>
</tr>
</tbody>
</table>

Supporting Science Courses

Select a minimum of 8 credits from the following courses:  8

FRSC 450  Practical Forensic Skeletal Biology
BINF 401  Bioinformatics and Computational Biology I
BINF 402  Bioinformatics and Computational Biology II
BIOL 305 & BIOL 306  Biology of Microorganisms and Biology of Microorganisms Laboratory
BIOL 404  Medical Microbiology
BIOL 405  Microbial Genetics
BIOL 412  Phage Genomics
BIOL 417  Selected Topics in Molecular and Cellular Biology (When the topic is "Illumina Sequencing")
BIOL 431  Advanced Human Anatomy and Physiology I
BIOL 452  Immunology
& BIOL 453  and Immunology Laboratory
BIOL 482  Cell Signaling and Disease
CHEM 331 & CHEM 336  Physical Chemistry I and Physical Chemistry Lab I
CHEM 427  Aquatic Environmental Chemistry
CHEM 446  Bioinorganic Chemistry
CHEM 463 & CHEM 465  General Biochemistry I and Biochemistry Lab
CHEM 464  General Biochemistry II

Total Credits  15

Concentration in Forensic Biology (FRBL)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>FRSC 325</td>
<td>Molecular Biology</td>
<td>4</td>
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</tbody>
</table>
& FRSC 326  and Molecular Biology Laboratory
FRSC 470  Forensic Genomics  4
BIOL 483  General Biochemistry  4

Supporting Science Courses

Select a minimum of 3 credits from the following courses:  3

FRSC 450  Practical Forensic Skeletal Biology
BINF 401  Bioinformatics and Computational Biology I
BINF 402  Bioinformatics and Computational Biology II
BIOL 305 & BIOL 306  Biology of Microorganisms and Biology of Microorganisms Laboratory
BIOL 404  Medical Microbiology
BIOL 405  Microbial Genetics
BIOL 412  Phage Genomics
BIOL 417  Selected Topics in Molecular and Cellular Biology (When the topic is "Illumina Sequencing")
BIOL 430  Advanced Human Anatomy and Physiology I
BIOL 431  Advanced Human Anatomy and Physiology II
BIOL 452  Immunology
& BIOL 453  and Immunology Laboratory
BIOL 482  Introduction to Molecular Genetics
BIOL 484  Cell Signaling and Disease

Total Credits  15
Concentration in Forensic Chemistry (FRCH)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>FRSC 404</td>
<td>Advanced Instrumentation in Forensic Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 321</td>
<td>Quantitative Chemical Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MATH 114</td>
<td>Analytic Geometry and Calculus II</td>
<td>4</td>
</tr>
</tbody>
</table>

Supporting Science Courses

Select a minimum of 7 credits from the following courses:

- CHEM 331 Physical Chemistry I and Physical Chemistry Lab I
- CHEM 332 Physical Chemistry II and Physical Chemistry Lab II
- CHEM 422 Instrumental Methods of Chemical Analysis and Instrumental Methods of Chemical Analysis Laboratory
- CHEM 427 Aquatic Environmental Chemistry
- CHEM 441 Properties and Bonding of Inorganic Compounds
- CHEM 446 Bioinorganic Chemistry
- CHEM 463 General Biochemistry I and Biochemistry Lab
- CHEM 464 General Biochemistry II

Total Credits: 19

These course selections recommend the University Physics sequence.

Mason Core and Electives

In order to meet a minimum of 120 credits, this degree requires additional credits (specific credit counts by concentration are shown below), which may be applied toward any remaining Mason Core (https://catalog.gmu.edu/mason-core/) requirements (outlined below), Requirements for Bachelor's Degrees (https://catalog.gmu.edu/policies/academic/undergraduate-policies/#ap-5-3-2), and electives. Students are strongly encouraged to consult with their advisors to ensure that they fulfill all requirements.

- Standard concentration: 35-38 credits
- Forensic Biology concentration: 32-35 credits
- Forensic Chemistry concentration: 28-31 credits

Mason Core

Some Mason Core (http://catalog.gmu.edu/mason-core/) requirements may already be fulfilled by the major requirements listed above. Students are strongly encouraged to consult their advisors to ensure they fulfill all remaining Mason Core (http://catalog.gmu.edu/mason-core/) requirements.

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<tr>
<td>WRIT 101</td>
<td>Written Communication (ENGH 101)</td>
<td>3</td>
</tr>
<tr>
<td>WRIT 102</td>
<td>Oral Communication</td>
<td>3</td>
</tr>
</tbody>
</table>

Quantitative Reasoning (http://catalog.gmu.edu/mason-core/#quantitative)

Information Technology and Computing (http://catalog.gmu.edu/mason-core/#information-technology)

Exploration Requirements

- Arts (http://catalog.gmu.edu/mason-core/#arts)
- Global Understanding (http://catalog.gmu.edu/mason-core/#global)
- Literature (http://catalog.gmu.edu/mason-core/#literature)
- Natural Science (http://catalog.gmu.edu/mason-core/#natural-science)
- Social and Behavioral Sciences (http://catalog.gmu.edu/mason-core/#social-behavioral-science)
- Western Civilization/World History (http://catalog.gmu.edu/mason-core/#western-civilization-world-history)

Integration Requirements

- Written Communications (ENGH 302) (http://catalog.gmu.edu/mason-core/#written)
- Writing-Intensive (http://catalog.gmu.edu/mason-core/#wi)
- Synthesis/Capstone (http://catalog.gmu.edu/mason-core/#synthesis-capstone)

Total Credits: 40

1 Most programs include the writing-intensive course designated for the major as part of the major requirements; this course is therefore not counted towards the total required for Mason Core.

2 Minimum 3 credits required.

Accelerated Master's

Forensic Science, BS/Forensic Science, Accelerated MS Overview

This bachelor's/accelerated master's degree program allows academically strong undergraduates with a commitment to advance their education to obtain both the Forensic (https://catalog.gmu.edu/colleges-schools/science/chemistry-biochemistry/chemistry-bs/) Science, BS (https://catalog.gmu.edu/colleges-schools/science/forensic-program/forensic-science-bs/) and the Forensic Science, MS (https://catalog.gmu.edu/colleges-schools/science/forensic-program/forensic-science-ms/) degrees within an accelerated timeframe. Upon completion of this 144 credit accelerated program, students will be exceptionally well prepared for entry into their careers or into a doctoral program in the field or in a related discipline.

Students are eligible to apply for this accelerated program once they have earned at least 60 undergraduate credits and can enroll in up to 18 credits of graduate coursework after successfully completing 75 undergraduate credits. This flexibility makes it possible for students to complete a bachelor's and a master's in an accelerated timeframe.

For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees (http://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7). For policies governing all graduate degrees, see AP6 Graduate Policies (http://catalog.gmu.edu/policies/academic/graduate-policies/). For more information on undergraduates enrolling in graduate courses, see AP1.4.4 Graduate Course Enrollment by Undergraduates.
Concentration Declaration
Students must declare their intended concentration upon application. In the event that a student wishes to change their concentration, students may request to change their concentration by submitting a letter to the Forensic Science Program Director detailing the request and providing justification. These requests and possible substitutions/waivers will be considered on a case-by-case basis and only when the appropriate admissions requirements are met.

Application Requirements
Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Graduate Admission Policies (http://catalog.gmu.edu/admissions/graduate-policies/) section of this catalog.

Important application information and processes for this accelerated master’s program can be found here (https://www2.gmu.edu/admissions-aid/how-apply/accelerated-masters/).

Students should seek out the graduate program’s advisor who will aid in choosing the appropriate graduate courses and help prepare the student for graduate studies.

Application requirements for this accelerated master’s program include one letter of recommendation from a Forensic Science Program faculty member or advisor. Additionally, a detailed goal statement is required to include why you are interested in the MS in forensic science degree, career goals and professional aspirations, and proposed area of interest of your final Research Project.

The GRE and a resume are not required for admission into this program.

Successful applicants will have an overall GPA of at least 3.00. Additionally, they will have completed each of the following courses or equivalent with a GPA of 3.00 or higher:

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<td>FRSC 201</td>
<td>Introduction to Criminalistics</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 302</td>
<td>Forensic Trace Analysis</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 303</td>
<td>Forensic Evidence and Ethics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 213</td>
<td>Cell Structure and Function (Mason Core) (<a href="http://catalog.gmu.edu/mason-core/">http://catalog.gmu.edu/mason-core/</a>)</td>
<td>4</td>
</tr>
<tr>
<td>FRSC 540</td>
<td>Advanced Forensic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 541</td>
<td>Forensic Chemistry Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 560</td>
<td>Advanced Forensic DNA Sciences</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 561</td>
<td>Forensic DNA Laboratory</td>
<td>3</td>
</tr>
</tbody>
</table>

Forensic Biology Analysis Concentration Applicants:
In order to obtain a career as a DNA Analyst, the student should have undergraduate coursework in Statistics, Molecular Biology, Genetics, and Biochemistry.

Accelerated Option Requirements
After the completion of 75 undergraduate credits, students may complete 3 to 12 credits of graduate coursework that can apply to both the undergraduate and graduate degrees.

In addition to applying to graduate from the undergraduate program, students in the accelerated program must submit a bachelor’s/accelerated master’s transition form (available from the Office of the University Registrar (https://registrar.gmu.edu/forms/)) to the College of Science’s Office of Academic and Student Affairs (https://cos.gmu.edu/about/contact-us/) by the last day to add classes of their final undergraduate semester. Students shall enroll for courses in the master’s program in the fall or spring semester immediately following conferral of the bachelor’s degree.

Students must maintain an overall GPA of 3.00 or higher in all graduate coursework and should consult with their faculty advisor to coordinate their academic goals.

Reserve Graduate Credit
Accelerated master’s students may also take up to 6 graduate credits as reserve graduate credits. These credits do not apply to the undergraduate degree, but will reduce the master’s degree by up to 6 credits. With 12 graduate credits counted toward the undergraduate degree plus the maximum 6 reserve graduate credits, the credits necessary for the graduate degree can be reduced by up to 18.

Premium Tuition
Students enrolled in this professional MS program are charged at a differential (premium) tuition rate after the bachelor’s degree has been conferred. Therefore, any courses or secondary programs that they may enroll in are subject to the differential tuition rate. The Forensics Graduate Certificate (https://catalog.gmu.edu/colleges-schools/science/forensic-program/forensics-graduate-certificate/) has the same premium tuition rate, making it the ideal program for concurrent enrollment (if desired).

Criminal Background Check
The successful passing of a Virginia Department of Forensic Sciences background check is required prior to gaining access to FRSC 540 Advanced Forensic Chemistry, FRSC 541 Forensic Chemistry Laboratory, FRSC 560 Advanced Forensic DNA Sciences, and FRSC 561 Forensic DNA Laboratory.

Course Notes
- FRSC 560 Advanced Forensic DNA Sciences and FRSC 561 Forensic DNA Laboratory

Students shall have completed undergraduate coursework in molecular and/or cell biology, as well as genetics, or students must obtain permission of the instructor prior to taking FRSC 560 Advanced Forensic DNA Sciences and FRSC 561 Forensic DNA Laboratory.
- FRSC 540 Advanced Forensic Chemistry and FRSC 541 Forensic Chemistry Laboratory.

Students shall have completed undergraduate coursework in general chemistry including polarity and acid/base chemistry. Students shall also have completed Organic Chemistry and be able to identify functional groups and other chemistry structures that make up a molecule. Exposure to instrumental techniques such as gas chromatography, mass...
spectrometry and infrared spectroscopy is recommended or permission of instructor.

**Graduate Course Suggestions**

Upon acceptance, students must meet with a master's accelerated program advisor to complete a Plan of Study form in order to approve eligible graduate coursework prior to registering for any graduate courses. Failure to do so may result in the removal of the course(s). Approval does not guarantee availability in a course. The following are suggested graduate courses:

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>FRSC 500</td>
<td>Introduction to Forensic Science</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 510</td>
<td>Basic Crime Analysis ¹</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 514</td>
<td>Survey of Forensic Chemistry, Biology, and DNA Analysis ²</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 530</td>
<td>Law and Forensic Science</td>
<td>3</td>
</tr>
<tr>
<td>FRSC 570</td>
<td>Trace and Physical Evidence Concepts ³</td>
<td>3</td>
</tr>
</tbody>
</table>

¹ Can only be selected if FRSC 401 has been completed.
² Can only be selected if FRSC 304 Forensic Chemistry and FRSC 460 Forensic DNA Analysis have been completed. This course is suggested for the Forensic Biology Analysis, the Forensic Chemistry Analysis, or the Forensic/Biometric Identity Analysis concentrations.
³ Suggested for the Crime Scene Investigation, the Forensic Biology Analysis, or the Forensic Chemistry Analysis concentrations.