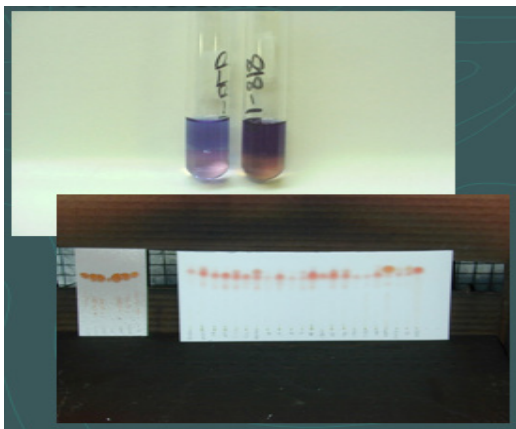


## Drug Chemistry

Coursework: 20 hours of chemistry, including two semesters of general chemistry (with lab), two semesters of organic chemistry (with lab).



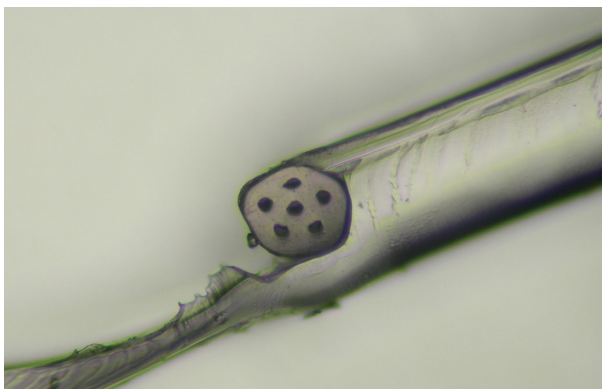
## Toxicology

Degree: chemistry or other natural sciences.

Coursework: at least 25 credit hours in chemistry, including two semesters of general chemistry (with lab), two semesters of organic chemistry (with lab), one semester of quantitative analysis or analytical chemistry.

## Trace Evidence

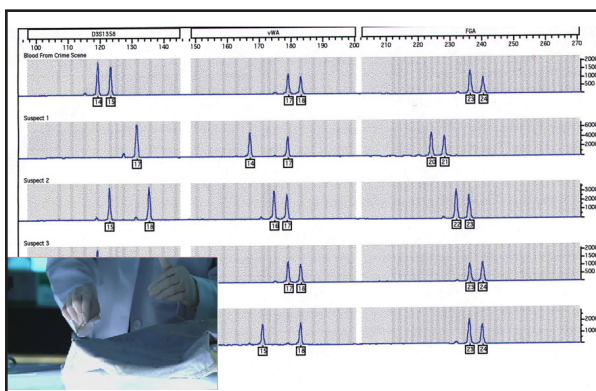
Coursework: At least 25 credit hours in chemistry, including two semesters of general chemistry (with lab), two semesters of organic chemistry (with lab), and one semester of quantitative analysis, analytical chemistry, instrumental analysis or equivalent.



Pentagon

## DNA Casework and DNA Profiling

Degree (or equivalent work) in biology, chemistry, or forensic science. Coursework--20 semester hours in biology with successful completion of college course work (graduate or undergraduate level) in biochemistry, genetics, and molecular biology totaling at least nine semester or equivalent credit hours. Coursework and/or training in statistics and population genetics are recommended.



### Forensic Science Advisor Contact Information:

Dr. Rich Biagioni  
Temple 458  
417-836-4649  
RNBiagioni@missouristate.edu

**Missouri State**  
UNIVERSITY

Department of Chemistry  
901 South National Ave.  
Springfield, MO 65897  
417-836-5506  
Chemistry@missouristate.edu  
chemistry.missouristate.edu

EO/AA



# Forensic Science Fact Sheet

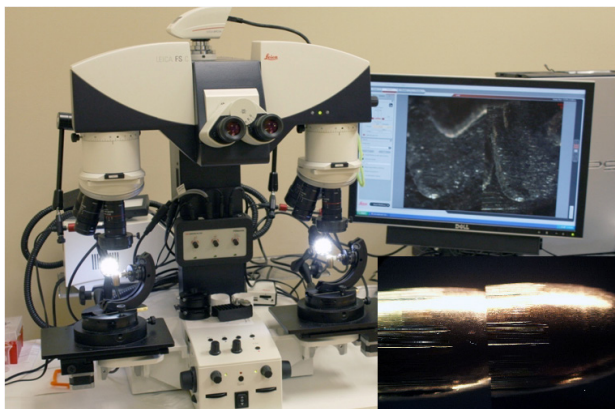
## Chemistry Department

College of Natural and Applied Sciences

[www.chemistry.missouristate.edu](http://www.chemistry.missouristate.edu)

**Missouri State**  
UNIVERSITY

Springfield



Bullet Comparison

## Role of the Forensic Chemist

A forensic chemist is a professional who analyzes evidence from crime scenes in order to identify and characterize the evidence as part of the larger process of solving a crime. Forensic chemists handle and evaluate evidence from crime scenes, but, unlike their depiction in popular media, they rarely conduct any investigativework themselves. Evidence may include hair samples, paint chips, glass fragments, or blood stains. Understanding the evidence requires tools from many disciplines, including chemistry, biology, materials science, and genetics. The prevalence of DNA analysis is making knowledge of genetics increasingly important in this field.

Public speaking skills and comfort with the subject matter are important personal characteristics for this career. Forensic chemists are often called upon to explain what was found and how they arrived at their conclusions.

Not all cases go to trial, but when one does, giving expert testimony in court is a significant part of a forensic chemist's job. Some employers require their forensic chemists to go through several months of mock courtroom testimony training along with their regular training. Forensic chemists must be able to give an impartial explanation to the jury that will assist them in reaching a final judgment.

Versatility and patience are the most often cited qualities of a forensic chemist. Forensic chemists must be able to rigorously apply analytical techniques to evidence and then defend their work in a court of law. They must be able to clearly and concisely answer challenges to their findings. Integrity is also an important characteristic, because it is not unusual for the different interests in a case to try to sway the forensic chemist's position.

## Career Paths

The career path for most forensic chemists is through federal, state, or county labs most often associated with a law enforcement agency such as a police department or state patrol. There are also different types of careers available, including those in other fields of forensic science, academe, or administration. Chemists can also move up within a particular organization, changing responsibilities along the way. For example, the director of a crime lab may supervise other forensic scientists rather than being involved in day-to-day analysis. A director may also be responsible for case review and general lab management.

## Work Description

Forensic chemists apply knowledge from diverse disciplines such as chemistry, biology, materials science, and genetics to the analysis of evidence found at crime scenes or on/in the bodies of crime suspects. Often, cases require application of a combination of scientific disciplines, and the forensic chemist will utilize a range of instrumental techniques from optical methods (UV, infrared, X-ray) to separations analyses (gas chromatography, HPLC, and thin-layer chromatography). A forensic chemist should be able to demonstrate critical thinking and problem-solving skills.

These examinations are performed by the forensic chemist in order to provide a scientific analysis of an alleged crime under investigation. The results of their work are used in police investigations and court trials, at which they may be called upon to provide expert testimony and explain their findings to a jury. Because of this, forensic scientists must not only have a knowledge of the examinations being performed, but also the ability

to effectively relate their findings to audiences that may not have a strong understanding of science.

## Education and Training

The forensic science job market has become more competitive over the past several years. A good academic record, particularly in relevant science courses, is a critical step towards entering the field.

In all areas of forensic science, a strong background in the natural sciences, particularly chemistry and biology, is vital. Those interested in working with trace evidence, such as glass, hair, and fibers, should focus on instrumentation skills and take courses in chemistry, biology, and physics (with an emphasis on optics). If forensic biology and DNA analysis are preferred, take microbiology, genetics, and biochemistry courses. Those interested in the toxicological aspects of this work should study physiology, biochemistry, and chemistry (particularly quantitative analysis and instrumental analysis).

It is very worthwhile to check job listings posted, for example, on the Missouri Highway Patrol's website to see what the specific requirements are for different job titles. The following are specific requirements for Criminalist I (entry level) positions. All require a bachelor's degree in a natural science (specific sciences are noted), along with the coursework noted. Survey or non-majors courses are not accepted. Additional guidance for recommended coursework is provided on the Chemistry Department's website.



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