FORENSIC SCIENCE
“Forensics” originates from the Latin word *forensis*, which means public, to the public discussion or debate, argumentative, and rhetorical. Today, however, the more modern definition of “Forensic” is that which relates to or is suitable to a court of law. Therefore, Forensic Science is science used for the purpose of law. Forensic Science is an occupation found all over the world, and it aims to resolve civil disputes, to justly enforce criminal laws and government regulations, and to protect public health. With the goal of seeking truth and justice in a legal proceeding, a job in this field focuses on finding and processing objective and unbiased evidence.

If you seek a rewarding job that lies at the cross sections of science, public health, and public safety, Forensic Science may be right for you!
What do Forensic Scientists Do?

Forensic scientists must be accurate, methodical, detailed and above all, unbiased. The ability to keep detailed notes and to write clear, concise, and accurate reports is vital.

- **Examine and provide analysis** of items provided to them
- Personally go to the scene to **conduct an on-site analysis**, **gather evidence** or document facts for later analysis
- Identify and then conduct the **examinations, tests or analyses** that are appropriate and relevant to the issue in dispute.
- **Interpret results and write a clear, concise report** documenting the steps followed to reach this conclusion
- A forensic scientist with a solid, documented background of education, training and experience in the scientific discipline used to conduct the examinations, testing or analysis about which the forensic scientist wants to testify, would qualify as an **expert witness** in a court of law.
Disciplines Within Forensic Science

The American Academy of Forensic Sciences is organized into eleven sections representing the different areas of interest, education, and expertise of individual members. In addition to educational requirements, most fields will require Board certification.

- **Anthropology**: reconstruct information about a person’s life and death through the study of the skeleton. Often earn a PhD in Anthropology.

- **Criminalistics**: analyze physical evidence using standardized, scientific processing techniques and report the results within the justice system. Often earn a MS in forensic science.

- **Digital and Multimedia Services**: a developing field that applies forensic practices to digital data. Often earn a BS in COS/Engineering and train through an apprenticeship.

- **Engineering Sciences**: “problem solvers who are brought into an investigation with no clear definition as to what they are going to do, but with the expectation that they will do something useful” using their disciplinary training. Often specialists within their discipline.

- **General**: spans the multitude of ways that forensic science is practiced but does not fit within the narrower definitions for other sections of the AAFS.

- **Jurisprudence**: specialize in providing counsel during matters being tried in court. Must have achieved a law degree.

[aafs.org/students/choosing-a-career/types-of-forensic-scientists-disciplines-of-aafs/]
Meet Henry Lee

- Known for his work on the JonBenét Ramsey case, as well as the Laci Peterson case, Henry Lee is almost as high profile as they come.
- Dr. Lee worked on the O.J. Simpson case, consulted on the Vincent Foster case, and was asked for insights in the D.C. sniper shootings.
- He was born in China, but fled with his family to Taiwan. He has a Ph.D. in biochemistry, and came to the U.S. specifically to study Forensic Science.
- The main blot on his career is that he is accused of evidence tampering in the Phil Spector case.

mastersinforensicscience.com/2010/top-10-most-famous-forensic-scientists-of-all-time/
Disciplines Within Forensic Science

- **Odontology:** Forensic dentistry is the application of dental knowledge, primarily for the identification of human remains. Must attain a DDS/DMD degree.

- **Pathology/Biology:** Forensic pathologists are MDs/DOs who perform autopsies to determine cause and manner of death. Forensic biologists apply life sciences knowledge to investigations; they typically possess a MS and/or PhD in a biological science.

- **Psychiatry & Behavioral Sciences:** work with attorneys and judges to offer expert testimony and provide guidance on assessment of issues such as competence and mental illness as it relates to criminal responsibility. May be psychiatrists with an MD/DO degree or psychologists, who have completed a PhD/PsyD. Psychologists can complete a post-doctoral fellowship in forensic psychology.

- **Questioned Documents:** provide analysis of writing instruments, writing mediums, and office machine products. Often have a bachelor’s degree in forensic science or a related area; must then complete a minimum 24 month training program.

- **Toxicology:** investigates how drugs and chemicals may have factored into an issue under investigation within three subfields: postmortem forensic toxicology, human performance toxicology, and forensic drug testing. A bachelor’s degree with solid life/physical science training followed by higher education is common.
Scotsman Joseph Bell was one of the inspirations for the literary character of Sherlock Holmes.

Dr. Bell was a pioneer in forensic pathology, believing that close observation was essential to crime-solving.

At the time, in the late 19th century, observations of the nature made by Bell were not often used to solve crimes.

Medically-trained, he was also the personal surgeon to Queen Victoria when she was in Scotland.

Some of his techniques are still used today by forensic scientists.
Sample Graduate Schools for Forensic Science

- Michigan State University  
  MS in Forensic Science

- Boston University School of Medicine  
  MS in Biomedical Forensic Science  
  MS in Forensic Anthropology

- John Jay College of Criminal Justice  
  MS in Forensic Science

- University of Illinois Chicago College of Pharmacy  
  MS in Forensic Science

The Forensic Science Education Programs Accreditation Commission (FEPAC) awarded its first accreditation in 2004. Attending an FEPAC accredited program ensures that the program meets educational criteria deemed valuable within the profession. Other criteria you may use to select schools include curriculum, access to forensic laboratory and internship opportunities, career placement rates, and location.
Common Application Requirements for MS/PhD Programs

- Application deadlines will typically be in the semester before expected matriculation.
- Most programs will require a personal statement, GRE or MCAT, CV/resume, and letters of recommendation.
- Some programs will have a minimum GPA and/or GRE requirement.
- Applicants should have academic or experiential training appropriate to the concentration sought. For example, applicants interested in the Forensic Chemistry concentration should have a BS in Chemistry, Biochemistry, or Chemical Engineering; those interested in the Forensic Biology concentration should have a bachelor's in Biology, Human Biology, Cell and Molecular Biology, Genetics, Biochemistry, etc.; and applicants interested in the Forensic Anthropology concentration should have a bachelor's in Anthropology with an emphasis in Physical Anthropology.
- Criminal backgrounds checks are often required.
The following courses...

Crime Scene Investigation, Survey in Forensic Science, Law and Forensic Science

One of the following concentrations...

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<tr>
<th>Forensic Chemistry</th>
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<tr>
<td>Mass Spectrometry</td>
<td>Molecular Biology</td>
<td>Osteology and Forensic Anthropology</td>
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<td>Advanced Analytical Chemistry II</td>
<td>Forensic Chemistry &amp; Microscopic Evidence</td>
<td>Human Osteology</td>
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<td>Forensic Analysis of Drugs and Alcohol</td>
<td>Forensic Serology</td>
<td>Bioarchaeology</td>
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<td>Forensic Chemistry and Microscopic</td>
<td>DNA Profiling</td>
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<td>Evidence</td>
<td>Conservation and Genetics or Population Genetics</td>
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<td>Scanning Electron Microscopy/Energy</td>
<td>Statistical Methods for Biologists I</td>
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<td>Dispersive X-Ray Microanalysis</td>
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<td>Pharmacology of Drug Addiction</td>
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Masters Thesis Research

Attend at least one Masters Seminar Series lecture per semester

Oral defense of thesis

forensic.msu.edu/documents/fshandbook.pdf
Forensic Science Publications of Interest

http://www.forensicsciencetechnician.net/top-25-forensic-science-journals-and-publications/
Princeton Alums in Forensic Science

- **Jeremy Colley ‘98 MD** is a psychiatrist who serves as an expert witness and performs evaluations for the courts.

- **Christo Franklin ‘89 MD** is the director of Project Satori, a new initiative that provides clinical and forensic psychological services for victims of sex trafficking.

- **Chris Rucinski ‘10** works at Elysium Digital, which provides consulting on digital/technology related manners. He is a certified forensic examiner.

- **Thomas Albright** was recently appointed to the National Commission on Forensic Science. He received a PhD in psychology and neuroscience from Princeton.
Hit TV shows such as Crime Scene Investigation and Silent Witness have fueled a surge in the number of forensic science degrees. Forensic Science in Media has its downsides as well. Teachers are working to avoid the "CSI Effect", which leads students to develop unrealistic expectations of how real forensic science is performed.
For more information...

- American Academy of Forensic Sciences: aafs.org
- Explore Health Careers Forensic Science Profile: explorehealthcareers.org/field/forensic-science
- Career Services resources: careerservices.princeton.edu/undergraduate-students/major-career-choices/industries-professions/forensics-criminology
- List of FEPAC Accredited Programs: fepac-edu.org/accredited-universities
- Forensic Scientist Hall of Fame: forensicsciencetechnician.net/forensics-hall-of-fame-10-forensic-scientists-who-made-history
- NJ Association of Forensic Scientists: njafs.org

“If the law has made you a witness, remain a man of science. You have no victim to avenge, no guilty or innocent person to convict or save — you must bear testimony within the limits of science.” -Dr. P.C.H. Brouardel