BACHELOR OF SCIENCE IN APPLIED SCIENCE IN FORENSIC SCIENCE

Forensic Science Program
Youngstown State University offers an undergraduate degree, the Bachelor of Science in Applied Science in Forensic Science. This is a multidisciplinary program drawing upon Criminal Justice, Forensic Science, Biological Sciences, Chemical Sciences, Sociology, and Anthropology. The program is housed in the Department of Chemical and Biological Sciences.

Forensic science can be broadly defined as the application of science to law. This program is designed to give students both a theoretical and practical background in the scientific, legal, and investigative aspects of forensic science. Graduates of the program are prepared for continued education in graduate programs or for immediate employment in forensic science-related facilities. Many careers in or related to forensic science require academic preparation beyond the undergraduate level. Students should be prepared to pursue advanced degrees within their discipline.

Admission Policy
Students wishing to transfer into the forensic science program must have and maintain a cumulative GPA of at least 2.5. Note: individuals with a felony, drug, and/or domestic violence conviction will experience difficulty gaining employment in the fields of forensic science and/or criminal justice. Students with misdemeanor convictions or juvenile sex offense convictions should seek advice from an advisor.

Internships
YSU’s Forensic Science program requires a six-semester hour internship experience which will provide students with the opportunity to integrate academic studies with the daily operations of a forensic science related facility. Each semester hour requires approximately 45 on-site hours. Internships also foster the development of networking relationships with practitioners who can assist in procuring future employment. Certain criminal convictions may prohibit students from being eligible for an internship experience.

For more information, visit the Forensic Science Program. (https://ysu.edu/academics/science-technology-engineering-mathematics/forensicsciencemajors/)

A Bachelor of Science in Applied Science degree in Forensic Science requires a minimum of 120 semester hours. The program is designed to be rigorous and multi-disciplinary, and allows for fewer electives in lower level courses but an increased flexibility in upper-division coursework. Students must complete the following coursework within their first 3 semesters at YSU, and must maintain at least a 2.5 GPA in order to remain in the FS program:

- STEM 1520 or YSU 1500
- ENGL 1550
- CRJS 1500
- FSCI 1510
- CHEM 1515
- CHEM 1515L
- Two MATH courses, if applicable (may include MATH 1510, MATH 1510C, MATH 1511, MATH 1511C, MATH 1513, MATH 1570, MATH 1571)

Robert E. Wardle III, M.S., Associate Professor
A minor is intended to contrast with or deepen a major or General Education. Forensic Science is an interdisciplinary major. Courses that are required for, and count toward, the Forensic Science major cannot be counted toward a minor.

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<th>COURSE</th>
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<td>YSU 1500</td>
<td>Success Seminar</td>
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<td>or HONR 1500</td>
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General Education Requirements

| ENGL 1550 | Writing 1 |
| or ENGL 1549 | Writing 1 with Support |
| ENGL 1551 | Writing 2 |
| CMST 1545 | Communication Foundations |
| MATH 1571 | Calculus 1 (required for major) |
| or MATH 1570 | Applied Calculus 1 |

Arts and Humanities (Select 2 courses)
Social and Personal Awareness (Select 2 courses)
Natural Science (2 courses; 1 with lab)

BIOL 2601 | General Biology 1: Molecules and Cells (required for major) |
| BIOL 2601L | General Biology I: Molecules and Cells Laboratory |
| BIOL 2602 | General Biology 2: Organisms and Ecology (required for major) |
| BIOL 2602L | General Biology: Organisms and Ecology Laboratory |
| CRJS 1500 | Introduction to Criminal Justice |
| ANTH 1500 | Introduction to Anthropology (required for major) |

Core Requirements (64 s.h.)

Chemistry

| CHEM 1515 | General Chemistry 1 |
| CHEM 1515L | General Chemistry 1 Laboratory |
| CHEM 1516 | General Chemistry 2 |
| CHEM 1516L | General Chemistry 2 Laboratory |
| CHEM 3719 | Organic Chemistry 1 |
| CHEM 3719L | Organic Chemistry 1 Laboratory |
| CHEM 3720 | Organic Chemistry 2 |
| CHEM 3720L | Organic Chemistry 2 Laboratory |
| CHEM 2604 | Quantitative Analysis |
| CHEM 2604L | Quantitative Analysis Laboratory |
| BIOL 3721 | Genetics |

Physics

| PHYS 1501 | Fundamentals of Physics 1 |
| & 1501L | Fundamentals of Physics Laboratory 1 |
| or PHYS 2610 & 2610L | General Physics 1 and General Physics Laboratory 1 |
| PHYS 1502 | Fundamentals of Physics 2 |
| & 1502L | Fundamentals of Physics Laboratory 2 |

Statistics

| STAT 3717 | Statistical Methods |

Criminal Justice and Forensic Sciences

| FSCI 1510 | Survey of Forensic Science |
| CRJS 2602 | Criminal Courts |
| FSCI 3714 | Forensic Science: Crime Scene Investigation |

Professor
Susan Ann Clutter, M.F.S., Associate Professor
Bachelor of Science in Applied Science in Forensic Science

Requirements

ANTHROPOLOGY (Select at least 16 s.h.)
- ANTH 2600 Human Osteology
- ANTH 3702 Archaeology
- ANTH 3703 Biological Anthropology
- ANTH 3777 Archaeological Techniques
- ANTH 3779 Fieldwork in Historical and Industrial Sites Archaeology
- ANTH 3780 Forensic Anthropology 1
- ANTH 4881 Forensic Anthropology 2

BIOLOGY (Select at least 16 s.h.)
- BIOL 3705 & 3705L Introduction to Human Gross Anatomy and Introduction to Human Gross Anatomy Laboratory

Chemistry (Select at least 16 s.h.)

Concentrations (Pick One - Biology, Chemistry, Anthropology, or Flexible Option)

CHEMISTRY (Select at least 16 s.h.)
- CHEM 3729 Inorganic Chemistry
- CHEM 3739 Physical Chemistry 1 & 3739L and Physical Chemistry 1 Laboratory
- CHEM 3740 Physical Chemistry 2 & 3740L and Physical Chemistry 2 Laboratory
- CHEM 3764 Chemical Toxicology
- CHEM 3785 Biochemistry 1 & 3785L and Biochemistry Laboratory
- CHEM 3786 Biochemistry 2
- CHEM 4891 Special Topics
- CHEM 5804 & 5804L Chemical Instrumentation and Chemical Instrumentation Laboratory
- CHEM 5821 Intermediate Organic Chemistry
- CHEM 5822 Advanced Organic Laboratory & 5822L and Advanced Organic Laboratory

BIOLOGY (Select at least 16 s.h.)
- BIOL 3702 Microbiology & 3702L and Microbiology Laboratory
- BIOL 3703 Clinical Immunology & 3703L and Clinical Immunology Laboratory
- BIOL 3705 & 3705L Introduction to Human Gross Anatomy and Introduction to Human Gross Anatomy Laboratory
- BIOL 3711 Cell Biology Fine Structure
- BIOL 3730 Human Physiology & 3730L and Human Physiology Laboratory
- BIOL 4800 Bioinformatics & 4800L and Bioinformatics Laboratory
- BIOL 4839 Selected Topics in Physiology
- BIOL 3785 & 3785L Biochemistry 1 and Biochemistry Laboratory
- BIOL 3786 Biochemistry 2
- BIOL 4850 Problems in Biology
- BIOL 4890 & 4890L Molecular Genetics and Molecular Genetics Laboratory
- BIOL 5827 Gene Manipulation

ANTHROPOLOGY (Select at least 16 s.h.)
- ANTH 2600 Human Osteology
- ANTH 3702 Archaeology
- ANTH 3703 Biological Anthropology
- ANTH 3777 Archaeological Techniques
- ANTH 3779 Fieldwork in Historical and Industrial Sites Archaeology
- ANTH 3780 Forensic Anthropology 1
- ANTH 4881 Forensic Anthropology 2

FSCI 3714 Forensic Science: Crime Scene Investigation
- FSCI 3714L Forensic Science CSI Lab
- MATH 1571 Calculus 1
- MATH 1572 Calculus 2
- MATH 2573 Calculus 3
- MATH 3574 Partial Differential Equations
- MATH 4575 Complex Variables
- MATH 5576 Topology

FSCI 4850 Special Topics in Forensic Sciences
- FSCI 4853 Forensic Firearms Examination
- FSCI 4854 Death Investigation
- CSCI 4870 Biometrics
- CHEM 3719R Organic Chemistry Recitation 1
- CHEM 3720R Organic Chemistry Recitation 2
- PHLT 3731 Drug Use and Abuse
- PHLT 5840 Agents of Mass Casualty
- ENST 3700 Environmental Chemistry & 3700L and Environmental Chemistry Lab
- ENST 3730 Air Quality
- ENST 3751 Water Quality Analysis & 3751L and Water Quality Analysis Lab
- ENST 3752 Soil Quality and Analysis
- ENST 3781 Environmental Sampling Methods

Total Semester Hours 120-122

There may be other courses that qualify for upper division electives, but you must discuss these options with an academic advisor and get pre-approval.

Year 1

Fall
- YSU 1500 Success Seminar 1-2
- ENGL 1550 Writing 1 or ENGL 1549 Writing 1 with Support 3-4
- FSCI 1510 Survey of Forensic Science 3
- CRJS 2600 Criminal Courts 3
- CHEM 1500 General Chemistry 1 3
- CHEM 1510L General Chemistry 1 Laboratory 1

Spring
- ENGL 1551 Writing 2 3
- CRJS 2602 Criminal Courts 3
- ANTH 1500 Introduction to Anthropology 3
- CHEM 1501 General Chemistry 2 3
- CHEM 1510L General Chemistry 2 Laboratory 1
- Social and Personal Awareness 3

Year 2

Fall
- CMST 1545 Communication Foundations 3
- FSCI 3714 Forensic Science: Crime Scene Investigation 2
- FSCI 3714L Forensic Science CSI Lab 1
- MATH 1571 Calculus 1 4
- CHEM 3715 Organic Chemistry 3
- CHEM 3715L Organic Chemistry 1 Laboratory 1

Spring
- FSCI 3716 Forensic Science Evidence Analysis 2
Learning Outcomes

1. Students will demonstrate knowledge on the influence of the CJ system at the subsystem levels (policing, courts, and corrections).
2. Students can analyze scientific situations, and apply the scientific method within the CJ judicial system.
3. Students can explain biology principles and how they relate to forensic science.
4. Students can explain chemistry principles and how they relate to forensic science.
5. Students can explain basic physics and math principles, and how they relate to forensic science.

Bachelor of Science in Applied Science in Forensic Science

- Semester Hours: 14

Year 3
Fall
- BIOL 2601: General Biology 1: Molecules and Cells (3)
- BIOL 2601L: General Biology 1: Molecules and Cells Laboratory (1)
- FSCI 3720: Forensic Fire and Explosive Investigation (3)
- CHEM 2604: Quantitative Analysis (5)
- CHEM 2604L: Quantitative Analysis Laboratory (0)
- Arts and Humanities Electives (3)
- Concentration Electives (4)

Semester Hours: 16

Spring
- BIOL 2602: General Biology 2: Organisms and Ecology (3)
- BIOL 2602L: General Biology 2: Organisms and Ecology Laboratory (1)
- STAT 3717: Statistical Methods (4)
- Concentration Electives (4)

Semester Hours: 16

Year 4
Fall
- CRJS 4807: Criminal Justice Internship (6)
- PHYS 1501: Fundamentals of Physics 1 (4)
- PHYS 1501L: Fundamentals of Physics Laboratory 1 (1)
- Social and Personal Awareness (3)
- Concentration Electives (3)

Semester Hours: 17

Spring
- FSCI 3704: Practice and Ethics in Forensic Science (3)
- BIOL 3721: Genetics (3)
- PHYS 1502: Fundamentals of Physics 2 (3)
- PHYS 1502L: Fundamentals of Physics Laboratory 2 (1)
- Arts & Humanities (3)

Semester Hours: 13

Total Semester Hours: 120-122

Request a Graduation Evaluation after you have completed 80-85 s.h. from the BCHHS Advising/Deans Office, 2104 Cushwa Hall, 330-941-3221.

- FSCI 1510: Survey of Forensic Science 3 s.h.
  An overview of the history, evolution, and current state of the forensic science discipline. Discussion of the scientific method and its applicability to forensic science, a description of the various sub-disciplines and areas of specialty that contribute to the field as a whole, and a summary of training, education, certification, accreditation, legal, and constitutional issues related to the discipline. There will also be discussion of the basic application of biological, physical, chemical, medical, technological, and behavioral sciences to questions of evidence and law. This course is designed to be accessible to those without a natural science background and provide a comprehensive introduction to those considering further study within the discipline.
  Gen Ed: Natural Science.

- FSCI 3714: Forensic Science: Crime Scene Investigation 2 s.h.
  An introduction to the legal and practical aspects of crime scene investigation. Emphasis on the value of physical evidence and the skills and tools needed to recognize, collect and preserve physical evidence found at a crime scene. Concurrent with: FSCI 3714L.
  Prereq.: FSCI 1510 and sophomore standing.

- FSCI 3714L: Forensic Science CSI Lab 1 s.h.
  Laboratory section designed to teach the practical skills employed by criminalists collecting evidence at a crime scene. Students will gain experience using tools, techniques and procedures required to recognize and collect evidence by completing practical exercises.
  Prereq.: FSCI 1510 and sophomore standing.
  Coreq.: FSCI 3714.

- FSCI 3716: Forensic Science Evidence Analysis 2 s.h.
  Serves as an introduction to the techniques, instrumentation and procedures used in the examination and analysis of physical evidence in a forensic laboratory setting and the legal aspects regarding the use of laboratory reports in the investigation process. Concurrent with: FSCI 3716L.
  Prereq.: FSCI 3714, FSCI 3714L.

- FSCI 3716L: Forensic Science Evidence Analysis Laboratory 1 s.h.
  Laboratory section designed to familiarize students with the tools commonly used in the examination and analysis of physical evidence. Students will gain experience with the instrumentation, techniques, and procedures used for examining physical evidence through a variety of practical exercises.
  Prereq.: FSCI 3714, FSCI 3714L.
  Coreq.: FSCI 3716.

- FSCI 3720: Forensic Fire and Explosive Investigation 3 s.h.
  Forensic Fire and Explosives Investigation. Principles of fire science including fire detection and investigation of both fire and explosion scenes. Special emphasis on concepts of fire progression, origin and cause determinations, arson investigation, accidental explosions, and bombings.
  Prereq.: FSCI 3714 with grade of C or higher, or junior status, or permission of forensic coordinator.

- FSCI 4850: Special Topics in Forensic Sciences 3 s.h.
  Contemporary issues in criminal justice. Topics are announced prior to enrollment.
  Prereq.: Senior standing or permission of instructor.

- FSCI 4852: Trace Evidence 3 s.h.
  Teaches search methods, recovery procedures, and laboratory analysis for hairs, fibers, and other types of trace evidence in criminal investigations and prosecutions. Emphasis is on major cases that hinged on trace evidence, and the legal and ethical future of trace evidence. Some laboratory exercises with microscopes are included.
  Prereq.: FSCI 3714 or concurrent or permission from Instructor.

- FSCI 4853: Forensic Firearms Examination 3 s.h.
  This course features discussion on the forensic science involved in firearms examination, to include gun manufacturing, the physics of ballistics, gunpowder and gun primer residue analysis, serial number restoration, and shooting reconstruction. Legislation concerning handguns and other weapons in the US will also be covered.
  Prereq.: FSCI 3714 or concurrent or permission from Instructor.
FSCI 4854  Death Investigation  3 s.h.
A broad overview exploring the various facets of medicolegal death investigation including discussion of history, standard procedures, methods and techniques, safety, scene documentation, cause and manner of death determination, autopsy, toxicological analysis, and other issues related to the discipline. Course content will include graphic images, descriptions, and discussion. May include depictions of a sexual nature, nudity, the aftermath of violent actions, and/or catastrophe.
Prereq.: Junior standing or permission of instructor.

FSCI 5814  Practice and Ethics in Forensic Science  3 s.h.
Overview of the forensic science discipline as it relates to the criminal justice system including discussion of legal aspects, constitutional considerations, expert testimony, the role of the expert witness, and ethical standards and dilemmas. Also includes discussion of current events and the evolution and future of the forensic sciences.
Prereq.: FSCI 3714 and FSCI 3714L.
Gen Ed: Capstone.