

# 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. (<http://catalog.yzu.edu/archives/2020-2021/undergraduate/colleges-programs/college-health-human-services/department-criminal-justice-forensic-sciences/bas-forensic-science/>)

A Bachelor of Science in Applied Science degree in Forensic Science requires a minimum of 121 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:

- HAHS 1500- Introduction to BCHHS
- ENGL 1550- Writing I
- CRJS 1500- Introduction to Criminal Justice
- FSCI 1510- Survey of Forensic Science
- CHEM 1515- General Chemistry I
- CHEM 1515L- General Chemistry I Laboratory
- Two MATH courses, which may include MATH 1510, MATH 1510C, MATH 1511, MATH 1511C, MATH 1571, MATH 1572

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.

COURSE	TITLE	S.H.
<b>FIRST YEAR REQUIREMENT -STUDENT SUCCESS</b>		
YSU 1500	Success Seminar	1-2
or SS 1500	Strong Start Success Seminar	
or HONR 1500	Intro to Honors	
<b>General Education Requirements</b>		
ENGL 1550	Writing 1	3-4
or ENGL 1549	Writing 1 with Support	
ENGL 1551	Writing 2	3
CMST 1545	Communication Foundations	3
Mathematics		
MATH 1571	Calculus 1 (required for major)	4
Arts and Humanities (2 courses)		
Social and Personal Awareness (2 courses)		
Natural Science (2 courses; 1 with lab) <sup>met with BIOL 2601 and 2602</sup>		
BIOL 2601 & 2601L	General Biology: Molecules and Cells and General Biology: Molecules and Cells Laboratory (required for major)	4
BIOL 2602 & 2602L	General Biology: Organisms and Ecology and General Biology: Organisms and Ecology Laboratory (required for major)	4
Social Sciences (2 courses) <sup>Met with CJFS 1500 and ANTH 1500</sup>		
CRJS 1500	Introduction to Criminal Justice	3
ANTH 1500	Introduction to Anthropology (required for major)	3
<b>Core Requirements (65 s.h.)</b>		
<b>Chemistry</b>		
CHEM 1515 & 1515L	General Chemistry 1 and General Chemistry 1 Laboratory	4
CHEM 1516 & 1516L	General Chemistry 2 and General Chemistry 2 Laboratory	4
CHEM 3719 & 3719L	Organic Chemistry 1 and Organic Chemistry 1 Laboratory	4
CHEM 3720 & 3720L	Organic Chemistry 2 and Organic Chemistry 2 Laboratory	4
CHEM 2604 & 2604L	Quantitative Analysis and Quantitative Analysis Laboratory	5
<b>Additional Biology</b>		
BIOL 3721	Genetics	3
<b>Physics</b>		
PHYS 2610 & 2610L	General Physics 1 and General Physics Laboratory 1	5
PHYS 2611 & 2611L	General Physics 2 and General Physics laboratory 2	5
<b>Mathematics &amp; Statistics</b>		
STAT 3717	Statistical Methods	4
MATH 1572	Calculus 2	4
<b>Criminal Justice and Forensic Sciences</b>		
FSCI 1510	Survey of Forensic Sciences	3
CRJS 2602	Criminal Courts	3
FSCI 3714	Forensic Science: Crime Scene Investigation	2
FSCI 3716	Forensic Science Evidence Analysis	2
FSCI 3700	Forensic Fire and Explosive Investigation	3
FSCI 4850	Special Topics in Forensic Sciences	3
CRJS 4807	Criminal Justice Internship	3-12
FSCI 5814	Practice and Ethics in Forensic Science	3
<b>Concentrations (Pick One -Biology, Chemistry or Anthropology)</b>		<b>13-16</b>

**CHEMISTRY (Select at least 13 s.h.)**

CHEM 3729	Inorganic Chemistry
CHEM 3739 & 3739L	Physical Chemistry 1 and Physical Chemistry 1 Laboratory
CHEM 3740 & 3740L	Physical Chemistry 2 and Physical Chemistry 2 Laboratory
CHEM 3764	Chemical Toxicology
CHEM 3785 & 3785L	Biochemistry 1 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 & 5822L	Advanced Organic Laboratory and Advanced Organic Laboratory

**BIOLOGY (Select at least 13 s.h.)**

BIOL 3702 & 3702L	Microbiology and Microbiology Laboratory
BIOL 3703 & 3703L	Clinical Immunology 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 3716	Molecular Microbiology 1: Nucleic Acids
BIOL 3730 & 3730L	Human Physiology and Human Physiology Laboratory
BIOL 4800 & 4800L	Bioinformatics and Bioinformatics Laboratory
BIOL 4839	Selected Topics in Physiology
CHEM 3785 & 3785L	Biochemistry 1 and Biochemistry Laboratory
CHEM 3786	Biochemistry 2
BIOL 4850	Problems in Biology

**ANTHROPOLOGY (Select at least 16 s.h.)**

ANTH 2600	Human Osteology
ANTH 3702	Archaeology
ANTH 3703	Biological Anthropology
ANTH 3778	Archaeological Techniques
ANTH 3779	Fieldwork in Historical and Industrial Sites Archaeology
ANTH 3780	Forensic Anthropology 1
ANTH 4800	Undergraduate Research
ANTH 4881	Forensic Anthropology 2
ANTH 4883	Case Studies in Forensic Anthropology
ANTH 4891	Advanced Topics in Biological Anthropology
BIOL 3705 & 3705L	Introduction to Human Gross Anatomy and Introduction to Human Gross Anatomy Laboratory
GEOG 5812	Global Positioning Systems and GIScience

**Electives to meet 120 hours** 1**Optional courses (not a track)**

BIOL 4890 & 4890L	Molecular Genetics and Molecular Genetics Laboratory
BIOL 5827	Gene Manipulation
FSCI 4850	Special Topics in Forensic Sciences
CHEM 3719R	Organic Chemistry Recitation 1
CHEM 3720R	Organic Chemistry Recitation 2
PHLT 3731	Drug Use and Abuse
PHLT 5810	Agents of Mass Casualty

PHLT 5812 Crisis Management in Public Health

**Total Semester Hours** 121-135

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

**Year 1**

<b>Fall</b>		<b>S.H.</b>
YSU 1500	Success Seminar	1
ENGL 1550 or ENGL 1549	Writing 1 or Writing 1 with Support	3-4
FSCI 1510	Survey of Forensic Sciences	3
CRJS 1500	Introduction to Criminal Justice	3
CHEM 1515 & 1515L	General Chemistry 1 and General Chemistry 1 Laboratory	4
Arts and Humanities Elective		3
<b>Semester Hours</b>		<b>17-18</b>

**Spring**

ENGL 1551	Writing 2	3
CRJS 2602	Criminal Courts	3
ANTH 1500	Introduction to Anthropology	3
CHEM 1516 & 1516L	General Chemistry 2 and General Chemistry 2 Laboratory	4
Social and Personal Awareness		3
<b>Semester Hours</b>		<b>16</b>

**Year 2**

<b>Fall</b>		
CMST 1545	Communication Foundations	3
FSCI 3714	Forensic Science: Crime Scene Investigation	2
FSCI 3714L	Forensic Science: Crime Scene Investigation Lab	1
MATH 1571	Calculus 1	4
CHEM 3719 & 3719L	Organic Chemistry 1 and Organic Chemistry 1 Laboratory	4
<b>Semester Hours</b>		<b>14</b>

**Spring**

FSCI 3700	Forensic Fire and Explosive Investigation	3
FSCI 3716	Forensic Science Evidence Analysis	2
FSCI 3716L	Forensic Science Evidence Analysis Laboratory	1
MATH 1572	Calculus 2	4
CHEM 3720 & 3720L	Organic Chemistry 2 and Organic Chemistry 2 Laboratory	4
<b>Semester Hours</b>		<b>14</b>

**Year 3**

<b>Fall</b>		
BIOL 2601 & 2601L	General Biology: Molecules and Cells and General Biology: Molecules and Cells Laboratory	4
FSCI 4850	Special Topics in Forensic Sciences	3
STAT 3717	Statistical Methods	4
Elective 3700-Level		5
<b>Semester Hours</b>		<b>16</b>

**Spring**

BIOL 2602 & 2602L	General Biology: Organisms and Ecology and General Biology: Organisms and Ecology Laboratory	4
CHEM 2604 & 2604L	Quantitative Analysis and Quantitative Analysis Laboratory	5

Arts and Humanities		3
Elective 3700-Level		4
<b>Semester Hours</b>		<b>16</b>
<b>Year 4</b>		
<b>Fall</b>		
CRJS 4807	Criminal Justice Internship	3-12
PHYS 2610	General Physics 1	4
PHYS 2610L	General Physics Laboratory 1	1
Social and Personal Awareness		3
Elective 3700-Level		2
<b>Semester Hours</b>		<b>13-22</b>
<b>Spring</b>		
FSCI 5814	Practice and Ethics in Forensic Science	3
PHYS 2611	General Physics 2	4
PHYS 2611L	General Physics laboratory 2	1
BIOL 3721	Genetics	3
Elective 3700-Level		2
<b>Semester Hours</b>		<b>13</b>
<b>Total Semester Hours</b>		<b>119-129</b>

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

## 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.

### FSCI 1510 Survey of Forensic Sciences 3 s.h.

Overview of history, evolution, and current status. Discussion of training, education, certification, accreditation, and legal issues. Designed to be accessible to students without a science background and provide an introduction to forensic science for those considering further studies.

### FSCI 3700 Forensic Fire and Explosive Investigation 3 s.h.

Principles of fire science including fire detection, suppression, and investigation of both fire and explosion scenes. Special emphasis on concepts of fire progression, cause and origin determinations, arson investigation, and bombings.

**Prereq.:** CRJS 1500 or FSCI 1510.

### 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.

**Prereq.:** FSCI 1510 and sophomore standing.

**Concurrent with:** FSCI 3714L.

### FSCI 3714L Forensic Science: Crime Scene Investigation 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.

**Concurrent with:** 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.

**Prereq.:** FSCI 3714, FSCI 3714L.

**Concurrent with:** FSCI 3716L.

### FSCI 3716L Forensic Science Evidence Analysis Laboratory 1 s.h.

Laboratory section designed to familiarize students with instrumentation that is commonly used in the examination and analysis of physical evidence. Students will gain experience with the tools, techniques and procedures used for examining physical evidence through practical exercises.

**Prereq.:** FSCI 3714, FSCI 3714L.

**Concurrent with:** FSCI 3716.

### 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 4850C Special Topics in Criminal Justice Death Investigation 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 Chairperson.

### FSCI 4853 Forensic Firearms Examination 3 s.h.

This course features both lecture and laboratory work 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 Chairperson.

### 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.