FORENSIC SCIENCE 4+1 MS CHEMISTRY TRACK

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)

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.
FIRST YEAR REQUIREMENT -STUDENT SUCCESS		
YSU 1500	Success Seminar	1-2
or YSU 1500S	Youngstown State University Success Seminar	
or HONR 1500	Intro to Honors	
General Education Requirements		
ENGL 1550	Writing 1	3-4
or ENGL 1549	Writing 1 with Support	
ENGL 1551	Writing 2	3
Mathematics		
MATH 1571	Calculus 1 (required for major)	4
or MATH 1570	Applied Calculus 1	
Arts and Humanities (Select 2 courses)		6
Natural Science (2 courses; 1 with lab)	met with BIOL 2601 and 2602	
BIOL 2601	General Biology 1: Molecules and Cells (required for major)	3
BIOL 2601L	General Biology I: Molecules and Cells Laboratory	1
BIOL 2602	General Biology 2: Organisms and Ecology (required for major)	3
BIOL 2602L	General Biology: Organisms and Ecology Laboratory	1
Social Sciences (2 courses below required for major)		
CRJS 1500	Introduction to Criminal Justice	3
ANTH 1500	Introduction to Anthropology (required for major)	3
General Education Electives (9 s.h.)		
CMST 1545	Communication Foundations	3
Any 2 Gen Ed Courses		6
Core Requirements (64 s.h.)		
Chemistry		
CHEM 1515	General Chemistry 1	3
CHEM 1515L	General Chemistry 1 Laboratory	1
CHEM 1516	General Chemistry 2	3
CHEM 1516L	General Chemistry 2 Laboratory	1
CHEM 3719	Organic Chemistry 1	3
CHEM 3719L	Organic Chemistry 1 Laboratory	1
CHEM 3720	Organic Chemistry 2	3
CHEM 3720L	Organic Chemistry 2 Laboratory	1
CHEM 2604	Quantitative Analysis	5
CHEM 2604L	Quantitative Analysis Laboratory	0
Additional Biology		
BIOL 3721	Genetics	3
Physics		
PHYS 1501 & 1501L	Fundamentals of Physics 1 and Fundamentals of Physics Laboratory 1	5
or PHYS 2610 & 2610L	General Physics 1 and General Physics Laboratory 1	
PHYS 1502 & 1502L	Fundamentals of Physics 2 and Fundamentals of Physics Laboratory 2	4
Statistics		
STAT 3717	Statistical Methods	4
Criminal Justice and Forensic Sciences		
FSCI 1510	Survey of Forensic Science	3
CRJS 2602	Criminal Courts	3
FSCI 3714	Forensic Science: Crime Scene Investigation	2
FSCI 3714L	Forensic Science CSI Lab	1
FSCI 3716	Forensic Science Evidence Analysis	2
FSCI 3716L	Forensic Science Evidence Analysis Laboratory	1
FSCI 3720	Forensic Fire and Explosion Investigation	3
FSCI 4852	Trace Evidence	3
or FSCI 4853	Forensic Firearms Examination	
or FSCI 4854	Death Investigation	
CRJS 4807	Criminal Justice Internship	6
or STEM 4890	STEM Internship	
FSCI 5814	Practice and Ethics in Forensic Science	3
Concentrations (Pick One -Biology, Chemistry, Anthropology, or Flexible Option)		**16**
CHEMISTRY (Select at least 16 s.h.) at least 9 hours must be at the 5800/6900 level for 4+1 (See below for full list)		
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 16 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 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
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 3778	Archaeological Techniques
ANTH 3779	Fieldwork in Historical and Industrial Sites Archaeology
ANTH 3780	Forensic Anthropology 1
ANTH 4881	Forensic Anthropology 2
BIOL 3705 & 3705L	Introduction to Human Gross Anatomy and Introduction to Human Gross Anatomy Laboratory
Optional courses to meet 120 hours (16 hours). Students may take a flexible option of any 3700 or higher level courses to meet the degree requirements.	
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 5810	Agents of Mass Casualty
PHLT 5812	Crisis Management in Public Health
ENST 3700 & 3700L	Environmental Chemistry and Environmental Chemistry Lab
ENST 3730	Air Quality
ENST 3751 & 3751L	Water Quality Analysis 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.

Dual Credit Requirements

Accelerated 4+1 Program

Undergraduate Forensic Science students can apply for admission into the accelerated 4+1 MS in Chemistry graduate program after completing 78 undergraduate semester hours with a GPA of 3.0 or higher. After being admitted to the accelerated 4+1 MS program, students will be allowed a maximum of nine semester hours of graduate coursework, specified as 5000 level or higher, to be double counted toward both a bachelor's and master's degrees. The courses chosen to count for both undergraduate and graduate coursework must be approved by the Graduate Program Director. An additional three hours of graduate coursework can be completed as an undergraduate and used exclusively for graduate credit. This allows the student to graduate with a master's degree with one year of additional full-time study beyond the bachelor's degree, as the total hours counted towards the Master's degree is greater than or equal to 30 hours.

Courses Counting Towards Requirements

Select 3 of these courses, as only 3 can be double counted. Can select a 4th that would only count for the Master's degree.

COURSE	TITLE	S.H.
CHEM 6911	Advanced Analytical Chemistry 1	3
CHEM 6912	Advanced Analytical Chemistry 2	3
CHEM 6921	Advanced Biochemistry 1	3
CHEM 6941	Advanced Organic Chemistry 1	3
CHEM 6991K	Special Topics Organometallics	1-3
CHEM 6991Q	Special Topics Quantum Chemistry	1-3
CHEM 6980	Introduction to Chemical Research	3
CHEM 5804	Chemical Instrumentation	4
CHEM 5804L	Chemical Instrumentation Laboratory	0
CHEM 5822	Advanced Organic Laboratory	4
CHEM 5822L	Advanced Organic Laboratory	0

Year 1

Fall		**S.H.**
YSU 1500 or YSU 1500S or HONR 1500	Success Seminar or Youngstown State University Success Seminar or Intro to Honors	1-2
ENGL 1550 or ENGL 1549	Writing 1 or Writing 1 with Support	3-4
FSCI 1510	Survey of Forensic Science	3
CRJS 1500	Introduction to Criminal Justice	3
CHEM 1515	General Chemistry 1	3
CHEM 1515L	General Chemistry 1 Laboratory	1
	Semester Hours	**14-16**
Spring		
ENGL 1551	Writing 2	3
CRJS 2602	Criminal Courts	3
ANTH 1500	Introduction to Anthropology	3
CHEM 1516	General Chemistry 2	3
CHEM 1516L	General Chemistry 2 Laboratory	1
Gen Ed Elective		3
	Semester Hours	**16**

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 3719	Organic Chemistry 1	3
CHEM 3719L	Organic Chemistry 1 Laboratory	1
	Semester Hours	**14**
Spring		
FSCI 3716	Forensic Science Evidence Analysis	2
FSCI 3716L	Forensic Science Evidence Analysis Laboratory	1
FSCI 3720	Forensic Fire and Explosion Investigation	3
CHEM 3720	Organic Chemistry 2	3
CHEM 3720L	Organic Chemistry 2 Laboratory	1

Concentration Electives		4
	Semester Hours	**14**
Year 3		
Fall		
BIOL 2601	General Biology 1: Molecules and Cells	3
BIOL 2601L	General Biology I: Molecules and Cells Laboratory	1
FSCI 4850	Special Topics in Forensic Sciences	3
STAT 3717	Statistical Methods	4
Concentration Electives		5
	Semester Hours	**16**
Spring		
BIOL 2602	General Biology 2: Organisms and Ecology	3
BIOL 2602L	General Biology: Organisms and Ecology Laboratory	1
CHEM 2604	Quantitative Analysis	5
CHEM 2604L	Quantitative Analysis Laboratory	0
Arts and Humanities		3
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
Concentration Electives		3
Gen Ed Elective		3
	Semester Hours	**17**
Spring		
FSCI 5814	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 STEM Advising/Deans Office, 2325 Moser Hall, 330-941-2512.

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.