FORENSIC SCIENCE (FRNSC)

FRNSC 100: Introduction to Forensic Science

3 Credits

Introduction forensic science. FRNSC 100 Introduction to Forensic Science (3) (GN) The course will review the application of the physical and social sciences as they apply to the forensic analysis of evidence. Students will gain an understanding of how forensic science and the law intersect to solve crimes. The course will track evidence recovered from the crime scene, as it moves to the crime laboratory where it is analyzed and into the courtroom where it is presented to a jury. The course will cover the most common types of physical evidence obtained in criminal and civil cases.

General Education: Natural Sciences (GN)

FRNSC 200: Introduction to Crime Scene Investigation

3 Credits

This course offers an exploration of the science, management, and investigative techniques for the field of crime scene investigation. FRNSC 200 Introduction to Crime Scene Investigation (3) (GN) Students will develop the intellectual skills needed to be able to plan for and organize a crime scene investigation. Each student will understand the nature and value of each kind of physical evidence and how to recognize, collect and preserve it. They will research all the topics in this course and provide their own evidence of competency in each in the form of a professional portfolio. A student who demonstrates competency in matters of this course: * Employs the philosophies and practice of science; * Generates hypotheses of crimes based on evidence; * Can use deduction in a scientific manner; * Is tenacious when recovering and developing evidence; * Prescribes recovery and development cascades for fingerprints; trace evidence; impression evidence; biological evidence; * Prescribes and amends crime scene search plans; * Sketches crime scenes to scale; * Makes competent use of limited time, human and other resources; * Calculates: measurements for crime scene sketches; bullet trajectories; Angel of impact; and area of impact; * Provides complete, admissible reconstruction reports; * Understands and accounts for chain of custody

General Education: Natural Sciences (GN)

FRNSC 210: Essential Practices of Forensic Science

3 Credits

Practices of forensic science including documentation, microscopy, communication of results, and integration of concepts from other sciences, mathematics, and statistics. FRNSC 210 Essential Practices of Forensic Science (3) In this course, students will learn the essential practices of forensic science and criminalistics. The necessity of an objective, rigorous, scientific approach in a forensic investigation will be stressed. This course will prepare students to understand the foundation of forensic science practice including the basic knowledge required to understand the nature and origin of physical evidence, preservation of the physical evidence record, forensic microscopy, and communication of results. This course uses an intensive, problem-solving style and through practical exercises, students will be introduced to * Documentation techniques including measurements, notes, sketches, photography, and other techniques * Basic microscopy and forensic microscopy * Verbal and written communication of forensic findings The primary aims of the course are to * Introduce students to scientific philosophy, integrity, forensic science, criminalistics, basic practices of forensic science/criminalistics, and the role of the criminalist as they relate to a forensic investigation * Prepare students for advanced 400-level courses in forensic science and criminalistics.

Enforced Prerequisite: FRNSC100 and CHEM 110 and CHEM 111

FRNSC 294: Research Projects

1-12 Credits/Maximum of 12

Supervised student activities on research projects identified on an individual or small-group basis.

FRNSC 295: Internship

1-18 Credits/Maximum of 18

Supervised off-campus, nongroup instruction including field experiences, practica, or internships. Written and oral critique of activity required.

FRNSC 296: Independent Studies

1-18 Credits/Maximum of 18

Creative projects, including research and design, that are supervised on an individual basis and that fall outside the scope of formal courses.

FRNSC 400: Courtroom Proceedings and Testimony

1 Credits

Introduction to courtroom proceedings and testimony as they related to forensic science. FRNSC 400 Courtroom Proceedings and Testimony (1) Classroom discussions will focus on the structure and procedures of the courtroom, the role of its members, admissibility issues, and how testimony is presented in court. Students will read transcripts from actual forensic cases, will discuss how the evidence was presented in court, and will have an opportunity to present data in mock proceedings. At the end of the course, students will have a strong understanding of how courts operate regarding the introduction of forensic evidence. The course is relevant to any forensic science student who has taken FRNSC 201 and 301, and should be taken either concurrent with or before FRNSC 401. Any student in the Forensic Science major who has an interest in obtaining employment in a private forensic company or a local, state or federal law enforcement agency will benefit greatly from this course. This is a 400-level forensics course for students in the Forensic Science major. It will also satisfy a requirement for accreditation by the Forensic Science Education Programs Accreditation Commission (FEPAC).

Enforces Prerequisite: FRNSC411 and FRNSC413

FRNSC 410: A Scientific Approach to Crime Scene Investigation

2 Credits

Principles of crime scene investigation with emphasis on scientific philosophy, concepts, and procedures. FRNSC 410 A Scientific Approach to Crime Scene Investigation (2) In this course, students will learn many of the essential principles and techniques of crime scene investigation. The necessity of a rigorous scientific approach will be stressed. This course uses an intensive, problem-solving style to teach scene management and the recognition, evaluation, enhancement,
documentation, control, and collection of physical evidence. Students will
be introduced to: * Scene management principles * Search techniques *
Techniques to recognize, enhance, document, and collect various types
of physical evidence * Communication of procedures and results * Scene
reconstruction and its role in a scientific investigation The primary aim of
the course is to immerse students in the scientific philosophy, integrity,
scene investigation procedures, criminalistics, and role of the criminalist
as they relate to scene investigation.

**Enforced Prerequisites:** FRNSC 210 AND ( STAT 200 OR STAT 250 )

FRNSC 411: Criminalistics: Trace and Impression Evidence

3 Credits

Laboratory-based examination of forensic evidence; microscopy,
classification and identification. FRNSC 411 Criminalistics: Trace and
Impression Evidence (3) Laboratory-based examination of physical
evidence typically recovered from crime scenes. Examination of physical
evidence will occur according to established forensic procedures,
including the location of trace evidence and performance of presumptive
and confirmatory tests. Students will establish a laboratory notebook
to document their findings. Since forensic testing ultimately results in
testimony in a courtroom, students will prepare written reports of their
findings and learn how to present their findings in a courtroom setting.
The course will concentrate on microscopy (stereo, transmitted light,
polarized light, and comparison), physical and chemical techniques
to classify evidence, and pattern matching techniques to individualize
impression evidence. The course is relevant to any student majoring in
Forensic Science or who has an interest in obtaining employment in local,
state, or federal law enforcement agencies and crime lab facilities.

**Enforced Prerequisites:** FRNSC 210 AND ( STAT 200 OR STAT 250 ) AND
( PHYS 212 OR PHYS 251 )

FRNSC 413: Criminalistics: Biology

3 Credits

Laboratory-based examination of forensic evidence; biological fluid
identification, hair microscopy. FRNSC 413 Criminalistics: Biology
(3) Laboratory-based examination of biological evidence typically
recovered from crime scenes. Examination of biological evidence will
occur according to established forensic procedures, including the
identification of biological evidence and the performance of presumptive
and confirmatory tests. Students will establish a laboratory notebook
to document their findings. Since forensic testing ultimately results in
testimony in a courtroom, students will prepare written reports of their
findings and learn how to present their findings in a courtroom setting.
The course will concentrate on the analysis of biological such as human blood, semen, saliva, urine, fecal matter and hair; including
the employment of chemical, biological, and biochemical techniques
to classify evidence. The course is relevant to any student majoring in
Forensic Science or who has an interest in obtaining employment in local,
state, or federal law enforcement agencies and crime lab facilities.

**Enforced Prerequisite:** FRNSC major and FRNSC 210 and (BIOL 230W or
BMB 251 or BIOL 240W)

FRNSC 415: Laboratory in Crime Scene Investigation

2 Credits

Laboratory course covering crime scene investigation with emphasis on
scientific philosophy, concepts, procedures, problem solving, and hands-
on activities.

**Enforced Prerequisite:** FRNSC410

FRNSC 421W: Forensic Molecular Biology

4 Credits

Concepts and application of molecular biology techniques to analyze
biological evidence collected at crime scenes. FRNSC 421W Forensic
Molecular Biology (4) Classroom discussions will focus on the
application of biochemistry and molecular biology techniques in forensic
DNA analysis. The course will start with a history of forensic biology
techniques and move quickly to modern day techniques (e.g., STR
analysis). Laboratory analysis will include population and mock evidence
samples. Students will expand their knowledge of population genetics
and fine tune their practical laboratory skills. Students will learn about
laboratory safety, quality assurance and control, and ethics. They will
discuss how evidence is presented in court and have the opportunity
to present their data in mock deposition proceedings. Laboratory
exercises will result in the preparation of courtroom ready materials (data,
documents, and reports). Many of the classroom discussions will be
problem solving exercises designed to emphasize specific applications of
laboratory analysis. At the end of the course, students will have a strong
understanding of forensic STR analysis of biological evidence, and how
to convey their findings in written format. In the laboratory, students will
have analyzed different sample types, interpreted DNA profiles (including
mixtures), prepared laboratory reports and case files, and presented the
evidence in mock testimony proceedings. As a result, students will have
the basic skills necessary to work in a forensic biology or DNA crime
laboratory. The course is relevant to any Forensic Science major who
has an interest in obtaining employment in a local, state or federal law
enforcement agency and/or crime laboratory facility. This is a 400-level
forensics course that is required for students in the Forensic Science
major who elect to complete the biology option.

**Enforced Prerequisite:** CHEM 213 and CHEM 227 and (FRNSC 411 or
CHEM 431W)

FRNSC 427W: Forensic Chemistry

4 Credits

Analytical and instrumental methods used in the forensic sciences
with special emphasis on the analysis and characterization of trace
evidence. Forensic chemistry is a classroom and laboratory based
course designed to introduce the student to the forensic analysis of
trace evidence according to established forensic procedures. The trace
evidence can include paint, fire debris, glass, controlled drug substances,
blood alcohol analysis, fibers, smokeless powders, inks/dyes, gunpowder,
and low explosives. The focus of the course will be on identifying and
understanding the nature of the samples, common sample preparation
methods, chemical and analytical instrumental methods, and proper
collection and storage of evidence. The course will simulate the
methods in a standard forensic chemistry laboratory. The analytical
methods will include microscopical, spectroscopic, trace elemental,
and chromatographic analytical tools that are commonly used in these laboratories. The course will rely heavily on the students' knowledge and skills that have been learned or acquired during their studies in the pre-requisite course work. The pre-requisite knowledge include, but are not limited to: algebra, calculus, general chemistry, organic chemistry, analytical chemistry, basic statistics, polarizing light microscopy, spectroscopy theory, chromatography theory, proper evidence handling practice, and good writing skills. All of these knowledge areas are represented in the required pre-requisite courses which are CHEM 213 AND CHEM 227 AND (FRNSC 411 OR CHEM 431W).

**Enforced Prerequisite:** CHEM 213 and CHEM 227 and (FRNSC 411 or CHEM 431W)

Cross-listed with: CHEM 427W

Writing Across the Curriculum

FRNSC 475: Forensic Science Seminar

1 Credits

Presentation and discussion of special issues in forensic science; extension and application of background knowledge to unusual topics and cases.

**Prerequisite:** Prerequisite or concurrent: FRNSC485W

FRNSC 485: Coalescence of Forensic Science Concepts.

4 Credits

Advanced concepts in criminalistics as they apply to criminal and civil investigations.

**Prerequisite:** FRNSC411, FRNSC413, FRNSC415W; Concurrent: FRNSC421W, FRNSC427W

Writing Across the Curriculum

FRNSC 494: Research Projects

1-12 Credits/Maximum of 12

Supervised student activities on research projects identified on an individual or small-group basis.

FRNSC 496: Independent Studies

1-18 Credits/Maximum of 18

Creative projects, including research and design, that are supervised on an individual basis and that fall outside the scope of formal courses.

FRNSC 497: Special Topics

1-9 Credits/Maximum of 9

Formal courses given infrequently to explore, in depth, a comparatively narrow subject which may be topical or of special interest.