

American Academy of Forensic Sciences



Forensic Science Education Programs Accreditation Commission (FEPAC)



ACCREDITATION STANDARDS

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**FORENSIC SCIENCE EDUCATION PROGRAMS
ACCREDITATION COMMISSION
ACCREDITATION STANDARDS**

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FORENSIC SCIENCE EDUCATION PROGRAMS ACCREDITATION COMMISSION

ACCREDITATION STANDARDS

1.0 INTRODUCTION

1.1 Mission

The mission of the Forensic Science Education Programs Accreditation Commission (FEPAC) is to maintain and enhance the quality of forensic science education through a formal evaluation and accreditation system for college-level academic programs that lead to a baccalaureate or graduate degree.

1.2 Purpose

The purposes of FEPAC are:

1. to use the National Institute of Justice Technical Working Group for Education and Training in Forensic Science (TWGED) and the TWGED-DE curriculum guidelines to develop, to implement, to maintain, and to enhance rigorous, consensus educational standards for undergraduate and graduate forensic science programs at accredited institutions of higher education;
2. to develop and to implement a set of well-defined procedures for evaluating forensic science programs against those standards; and,
3. to encourage self-evaluation and continual improvement of forensic science education programs through the accreditation process.

1.3 History

The American Academy of Forensic Sciences (AAFS) was established in 1948 to promote education for and research in the forensic sciences; to encourage the study, improve the practice, elevate the standards, and advance the cause of the forensic sciences; to promote interdisciplinary communications; and to plan, organize, and administer meetings, reports, and other projects for the stimulation and advancement of these and related purposes.

An assessment of forensic sciences published in 1999 by the National Institute of Justice (NIJ), entitled “Forensic Science: Review of Status and Needs,” described the educational and training needs of the forensic science community as “immense.” Among the recommendations contained in the report was the establishment of the following:

1. national standards for education in forensic sciences;
2. an independent, community-wide, consensus-building, standard-setting body such as a technical working group for education in forensic sciences; and
3. an accreditation system for forensic science education programs.

The NIJ established a technical working group for education and training in forensic sciences (TWGED) in 2001 for the purpose of recommending sample curricular guidelines for educational programs in forensic sciences. The results of TWGED’s deliberations were delineated in a research report published in 2003, entitled “Education and Training in Forensic Sciences: A Guide for Forensic Science Laboratories, Educational Institutions, and Students.”

Acknowledging the importance of an accreditation system for academic programs built on the foundation of TWGED, the AAFS in 2002 established an *ad hoc* committee, called Forensic Education Program Accreditation Committee, to explore issues related to the development of such an accreditation system. In

2004, the Forensic Science Education Programs Accreditation Commission became an official standing committee of the AAFS and awarded its first accreditation in February 2004.

A second NIJ technical working group on education and training for digital evidence published its reports in 2007. In 2009 a committee composed of four FEPAC Commissioners and four representatives from academic and practitioner digital evidence programs began the process of incorporating standards for digital evidence forensic science programs into the FEPAC Standards.

1.4 Scope of Accreditation

1. FEPAC accredits forensic science education programs that lead to a bachelor's or master's degree in forensic science or in a natural science or computer science with a forensic science concentration. FEPAC also accredited undergraduate programs that lead to a bachelor's degree crime scene investigations.
2. An eligible forensic science program must be located in a regionally accredited institution of higher education that requires state, province, or equivalent approval.
3. Forensic Science programs outside the United States are also eligible if they do not have an established forensic science education accreditation system in their jurisdiction.

FEPAC promotes academic quality through formal accreditation of forensic science programs in the United States. All programs that FEPAC accredits are located within institutions that are accredited by a regional accreditation organization. The FEPAC accreditation process and policies employ rigorous, consensus standards that assure and advance academic quality at accredited institutions.

To ensure the accreditation requirements are valid and relevant indicators of the quality of education, FEPAC reviews its Accreditation Standards and Policies & Procedures on a regular schedule. In addition, FEPAC commissioners and on-site evaluators are trained on the various aspects of the accreditation process as a measure to promote reliability in application of the standards. Education programs are also monitored through annual reports to ensure continuous compliance with quality measures.

1.5 Expansion of the Scope of Accreditation

A need may develop for FEPAC to expand the scope of forensic educational programs, which it accredits to include disciplines other than criminalistics. FEPAC would first determine if there is sufficient demand among laboratories and programs to sustain the growth of the new educational discipline. Such an expansion would require a new set of curricular and other standards, and very likely, the development of sub-committees (Working Groups) comprised of at least one member of the FEPAC and others with expertise in the given profession. Members of the Working Groups will only offer accreditation recommendations for consideration by the FEPAC. When completed and reviewed by FEPAC, the standards will be published for public comment and disseminated to programs with potential interest in accreditation.

2.0 OVERVIEW OF THE STANDARDS

FEPAC accreditation standards guide and inform all aspects of the FEPAC accreditation program. The standards are divided into three parts: general standards that all programs must meet, undergraduate program standards, and graduate program standards.

3.0 GENERAL STANDARDS FOR ALL PROGRAMS

3.1 Eligibility

To be eligible for FEPAC accreditation or re-accreditation, a forensic science program shall document that:

1. the institution offering the program is regionally accredited; and,

2. the degree awarded upon successful completion of the program is at least a bachelor's degree in one of the following:
 - a. Forensic Science
 - b. Digital ForensicsA degree in one of the following disciplines with a concentration in forensic science or digital forensics:
 - 1) Computer Science
 - 2) Computer/Electrical Engineering
 - 3) Information Systems
 - 4) Information Technology
 - 5) A natural science
3. A program seeking FEPAC accreditation shall have graduated at least two classes before the Application for Accreditation (FEPAC Form 5.1) is submitted through the online system at www.fepac-edu.org.

3.2 Mission, Goals, and Objectives

The forensic science program shall have a documented and clearly formulated mission that is a succinct representation of the program's purpose for existence, philosophies, goals, and ambitions. The mission should be appropriate to the institution and consistent with the aspiration of the forensic science community to produce a technically skilled and educated workforce. Supporting goals and educational objectives should be clearly specified, consistent with the mission, and appropriate in light of the degree(s) awarded.

3.3 Planning and Evaluation

The program shall have an explicit written process and shall retain records demonstrating compliance for:

1. evaluating and monitoring its overall efforts to fulfill its mission, goals, and objectives;
2. assessing its effectiveness in serving its various constituencies;
3. modifying the curriculum as necessary, based on the results of its evaluation activities;
4. planning to achieve its mission in the future; and,
5. demonstrating continuous improvement.

The program shall conduct annual analytical self-evaluation that responds to the FEPAC standards. The documented evaluation shall include the following three components:

1. A summary statement about the program's compliance with each standard that identifies both best practices and problem areas.
2. An evaluation of the success with regard to student achievement. The program must provide documentation of how collected information is used in the evaluation and development of the program to meet its stated mission, goals, and objectives. The evaluation system shall include at least the following elements:
 - a. results of the student's performance in a capstone experience, forensic science standardized test results, publications, or reports;
 - b. exit questionnaire or interview of graduates;
 - c. post-graduate assessment, such as job placement surveys; and,
 - d. the program must demonstrate how collected information is used in the evaluation and development of the program to meet its stated mission, goals, and objectives.
3. An operational strategy that includes:
 - a. at least two significant continuous improvement initiatives; and,
 - b. any remediation around potential weakness or areas needing improvement with any FEPAC Standards.

The program shall also document its record of student performance, as measured by post-graduate assessments, and any additional outcome measures the program may use to assess student progress and achievement. These records shall be maintained for at least five years after student graduation. At least one measure of student achievement must be listed on the program's website. The measure(s) to be placed on the website are determined by the institution or program and shall be updated annually. The measures of student performance listed on the program's website must also be listed on the annual report to FEPAC.

3.4 Institutional Support

The program shall receive adequate support from the institution. As with other natural or computer science programs, the financial resources available to the program shall be sufficient to allow the program to achieve its mission, goals, and objectives. Classrooms, laboratories, and other program facilities, including equipment and supplies, shall be adequate for the size and scope of the program. Instructional and support services for the program shall also be adequate.

The program must demonstrate the following are sufficient to allow the program to achieve its mission, goals, and objectives:

1. the financial resources the institution makes available to the program;
2. the financial resources available to the program in comparison to those available to other natural science programs at the institution;
3. the physical facilities available to the program, including classrooms, laboratories, and any other facilities the program routinely uses; and,
4. the instructional and academic support services available to the program, including the library, learning center, computer center, and other major academic support services.

3.5 Faculty

All faculty members shall be appropriately qualified, by education and experience, to implement the instructional program. Forensic science faculty includes any faculty or instructional staff member who teaches a forensic science course or a support course designed specifically for the program.

1. The scientific and educational capabilities of the faculty shall be distributed over the major areas of the program. The number of faculty members shall be sufficient to ensure regular offerings of all courses needed for the degree program. Students shall not experience delays in graduating because of lack of course offerings.
2. Faculty members with working experience in a forensic science laboratory are preferred. However, overreliance on part-time or adjunct faculty members may be deemed inadequate institutional support.
3. Full-time faculty teaching in graduate programs shall have demonstrated research activity appropriate to their institution's mission.
4. Full-time faculty members shall oversee all coursework and ensure its applicability to the program's mission, goals, and objectives.
5. The following requirements apply separately to each degree program (e.g., B.S., M.S):
 - a) at least 50% of the full-time forensic science faculty shall have an appropriate doctoral degree; degree except for Crime Scene Investigations and Digital Evidence programs only, where 100% of the full-time faculty shall have at least an appropriate master's degree plus 5 years relevant experience, and,
 - b) at least 50% of the forensic science credit hours in a program must be taught by full-time faculty.
6. The program shall have well-defined policies and procedures to recruit, appoint, and promote qualified faculty, to evaluate the competence and performance of faculty, and to support the professional development and advancement of faculty.

3.6 Recruiting and Admissions Practices, Academic Calendars, Catalogs, Publications, Grading, and Advertising

The program shall have policies and procedures for student recruitment and admissions that locate and select qualified individuals who have the educational prerequisites and the interest and motivation to pursue careers in forensic science. These policies and procedures shall identify the scientific background necessary and clearly define the expectations for admission to, continuation in, and completion of the program. All statements made about the program in any promotional advertising, catalogs, or other institutional publications shall be accurate. During the recruitment and admissions process, the student shall be advised and informed of the typical suitability requirements particular to employment in the field. Specifically, students should be advised that background checks similar to those required for law enforcement officers are likely to be a condition of employment (Reference: NIJ Report NCJ 203099 – “Qualifications for a Career in Forensic Science,” pp.7-10).

The program shall ensure that all students receive timely and accurate information about the academic calendar, required coursework and degree requirements, grading policies and satisfactory academic progress, and other relevant academic policies.

All application, admission, and degree-granting requirements and regulations shall be applied equitably to individual applicants and students, regardless of age, sex, race, disability, religion, or national origin.

3.7 Student Support Services

The program shall provide adequate student support services, including mentoring, academic advising, and career and placement services. The program shall also provide an environment and culture that are congruent with professional standards and behaviors.

Students must be advised of specific curricular requirements of individual disciplines. For example, if pursuing a career as a forensic DNA analyst, nine cumulative hours of course work in biochemistry, molecular biology, and genetics is required; course work in population genetics and statistics is desirable. Employers will require documentation, such as a syllabus, for course work with other titles.

3.8 Record of Student Complaints

The program shall have a procedure for handling student complaints. At a minimum, this procedure shall include informing students of their right to file a complaint with the college or university and providing students with the institution’s procedures for filing such a complaint.

The program shall maintain a record of all complaints it receives, as well as the resolution of those complaints. The program shall make this record available to members of the on-site evaluation team during the on-site visit.

3.9 Distance Learning and Other Alternative Delivery Mechanisms

FEPAC considers distance learning to be one of several acceptable forms of instructional methodology. Therefore, FEPAC does not maintain separate standards for distance learning or other alternative delivery mechanisms and expects all programs to meet the same standards for accreditation, regardless of the instructional methodology used.

FEPAC acknowledges that laboratory-based instruction is integral to any science-based discipline such as forensic science. Therefore, any program that offers at least some instruction via distance learning shall demonstrate that it includes an appropriate laboratory experience for all students.

3.10 Professional Involvement

The program shall provide service to the forensic science profession and to the community through some combination of communication, collaboration, consultation, technical assistance, continuing education

programs, and any other means it may have for sharing the program's professional knowledge and competence. The purpose of this involvement is to provide opportunities for faculty and students to contribute to the advancement of the field of forensic science and to maintain program currency and credibility with practitioners and forensic science laboratory administrators.

3.10a Interaction with Forensic Science Laboratories

The program shall demonstrate formal, biennial interaction with at least one operational forensic science laboratory. This interaction must be on-going and documented. This relationship must take the form of two or more of the following:

1. student internships;
2. training opportunities in which the program provides instruction to laboratory personnel;
3. faculty serving on laboratory advisory committees;
4. coordinated research initiatives between the laboratory and academic program;
5. professional activities coordinated between the laboratory and the academic program; and,
6. laboratory personnel serving in an advisory capacity to the academic program.

3.10b Interaction with Forensic Science Organizations

The program shall demonstrate formal, biennial interaction with at least one professional forensic science organization. Interaction must take the form of two or more of the following:

1. faculty participation at a local, regional, national, or international forensic science conferences;
2. student attendance or participation at local, regional, national, or international forensic science conferences;
3. service activities to or for a professional organization; and,
4. hosting an educational, training, or outreach program with an external professional organization.

4.0 UNDERGRADUATE PROGRAM STANDARDS

An undergraduate forensic science program shall provide a basic foundation in the scientific and laboratory problem-solving skills necessary for success in a modern forensic laboratory. Such a program shall combine rigorous scientific and laboratory training with exposure to the breadth of forensic science disciplines, including forensic science practice, law enforcement, and ethics.

The undergraduate program in forensic science shall offer a coherent curriculum that reflects the mission and goals of the program and provides the student with the appropriate skills requisite for the bachelor's degree. The curriculum shall, at a minimum, ensure that each student:

1. Obtain a thorough grounding in the natural or computer sciences;
2. Build upon this background by taking a series of more advanced science classes; and
3. Develop an appreciation of issues specific to forensic science through course work and laboratory-based instruction.

The undergraduate forensic science degree should not necessarily be viewed as a terminal degree but as a preparation for a variety of graduate and professional degrees including clinical and analytical chemistry, medicine, law, and biomedical research and advanced degrees in forensic science.

4.1 CURRICULUM

4.1a Forensic Science Professional Practice Topics

The following topics must be covered in the curriculum:

- Courtroom testimony
- Introduction to law
- Quality assurance
- Ethics
- Professional practice
- Evidence identification, collection, processing

Normally, a topic will involve multiple class meetings and may involve multiple learning modalities, such as lectures, laboratories, and demonstrations. Evaluation of student mastery of each topic may be done through a number of modalities, but the topic material must be specifically addressed in a syllabus and assessed. The program shall have clear procedures for assessing and documenting each student's progress toward fulfillment of these objectives.

4.1b Forensic Science Courses

The following Forensic Courses must be covered in the curriculum.

- Forensic Science Survey Coursework – All tracks shall have at least three semester hours for a survey of forensic science class designed to ensure students are exposed the full breadth of forensic science disciplines in a full-service crime laboratory.
- Forensic Science Coursework – Each track shall have at least six semester hours in forensic science coursework that introduce students to methods, instrumentation, and concepts that are commonly associated with the professional practice of forensic science. At least three of the six semester hours must contain laboratory training.

Courses that fulfill this total nine semester hour requirement can be used to cover the topics listed in Standard 4.1a. However, these same courses may not be used to fulfill any of the 4.2 Specific Emphasis Track Curricular Requirements.

4.1c Forensic Science Capstone Experience

A minimum of three semester hours is required that should result in a capstone presentation, publication, or similar scholarly product. This requirement could be met in the following ways:

1. Capstone Course
2. Internships
3. Independent Research

4.2 Specific Emphasis Tracks Curricular Requirements

FEPAC currently accredits four concentrations (Criminalistics, Biology, Chemistry, Digital, and Crime Scene Investigations) for forensic science programs.

Curricula that follow the traditional criminalistics program (i.e., no concentrations, tracks, or specializations) should conform to the 4.2.1 Criminalistics Standards.

Curricula that have a specific concentration, track, or emphasis (e.g., Biology, Chemistry, Digital Evidence, Crime Scene Investigations) should conform to those curricula in Standards 4.2.2 through 4.2.5, respectively.

4.2.1 Criminalistics

These classes shall be consistent with the degree program and shall meet the needs of students following a general forensic science program or a program with no specified concentrations, tracks, or specializations.

4.2.1a Natural Science Courses

- **Biology:** at least two courses, which include the co-requisite laboratory, in biology for science majors (minimum 7 semester hours).
- **Physics:** at least two courses, which include the co-requisite laboratory, in physics for science majors (minimum 7 semester hours). Note: Calculus-based physics is preferred but not required.
- **Chemistry:** at least four courses, which include the co-requisite laboratory. Two of the courses shall be in general chemistry for science majors (minimum 7 semester hours), and two shall be in organic chemistry for science majors (minimum 7 semester hours).
- **Mathematics:** at least one course in differential and integral calculus (minimum 3 semester hours) and at least one course in statistics (minimum 3 semester hours).

4.2.1b Specialized Sciences Courses

A minimum of 15 additional semester hours in more advanced coursework in chemistry or biology. Note: These classes shall be consistent with the degree program and shall meet the needs of students specializing in sub-disciplines of forensic science. Introductory level courses may not be used to fulfill this requirement.

At least two of the classes shall include laboratory training (minimum 7 semester hours).

4.2.1c Forensic Science Courses

A minimum of six additional semester hours in advanced, upper-level forensic science courses that provide greater depth in forensic science beyond an introductory level are required. The courses shall include laboratory training.

4.2.2 Biology

These classes shall be consistent with the degree program and shall meet the needs of students specializing in the biology sub-discipline of forensic science.

4.2.2a Natural Science Courses

- **Biology:** at least two courses, which include the co-requisite laboratory, in biology for science majors (minimum 7 semester hours).

- **Physics:** at least two courses, which include the co-requisite laboratory, in physics for science majors (minimum 7 semester hours). Note: Calculus-based physics is preferred but not required.
- **Chemistry:** at least four courses, which include the co-requisite laboratory. Two of the courses shall be in general chemistry for science majors (minimum 7 semester hours), and two shall be in organic chemistry for science majors (minimum 7 semester hours).
- **Mathematics:** at least one course in differential and integral calculus (minimum 3 semester hours) and at least one course in statistics (minimum 3 semester hours).

4.2.2b Specialized Science Courses

A minimum of 15 additional semester hours in more advanced coursework in chemistry or biology that provide greater depth or breadth and are consistent with the biology concentration specialization. Introductory level courses may not be used to fulfill this requirement.

At least two of the classes shall include laboratory training (minimum 7 semester hours).

4.2.2c Forensic Sciences Courses

A minimum of six additional semester hours in advanced, upper-level forensic science courses that provide greater depth in forensic applications of biology beyond an introductory level are required. The courses shall include laboratory training.

4.2.3 Chemistry

These classes shall be consistent with the degree program and shall meet the needs of students specializing in the chemistry sub-discipline of forensic science.

4.2.3a Natural Science Courses

- **Biology:** at least two courses, which include the co-requisite laboratory, in biology for science majors (minimum 7 semester hours).
- **Physics:** at least two courses which include the co-requisite laboratory, in physics for science majors (minimum 7 semester hours). Note: Calculus-based physics is preferred but not required.
- **Chemistry:** at least four courses, which include the co-requisite laboratory. Two of the courses shall be in general chemistry for science majors (minimum 7 semester hours), and two shall be in organic chemistry for science majors (minimum 7 semester hours).
- **Mathematics:** at least one course in differential and integral calculus (minimum 3 semester hours) and at least one course in statistics (minimum 3 semester hours).

4.2.3b Specialized Science Courses

A minimum of 15 additional semester hours in more advanced coursework in chemistry or biology. Note: These classes shall be consistent with the degree program and shall meet the needs of students specializing in chemistry sub-disciplines of forensic science. Introductory level courses may not be used to fulfill this requirement.

At least two of the courses shall include the associated laboratory (minimum 7 semester hours).

4.2.3c Forensic Science Courses

A minimum of six additional semester hours in advanced, upper-level forensic science courses that provide greater depth in forensic applications of chemistry beyond an introductory level are required. The courses shall include laboratory training.

4.2.4 Digital Evidence

These classes shall be consistent with the degree program and shall meet the needs of students specializing in the computer science/information systems sub-disciplines of forensic science.

4.2.4a Natural Science Courses

1. **Mathematics:** at least two courses that include any combination of the following 3 semester hours courses:
 - Business Calculus
 - Calculus I
 - Calculus II
 - Business Statistics
 - Statistics I
 - Statistics II
2. **Sciences:** at least two courses, which include the co-requisite laboratory (minimum 7 semester hours total) from the following list:
 - Physics I
 - Physics II
 - General Chemistry I
 - General Chemistry II
 - Biology I
 - Biology II

4.2.4b Computer Science/Information Systems Courses

A minimum of 12 semester hours of coursework shall include the following courses and topics:

1. At least one 3-semester hour course in computer programming (examples of acceptable languages include Java, Python, C++, Ruby, etc.)
2. At least 6 semester hours in courses that cover the following topics:
 - Computer organization and structure
 - File systems and operating systems
 - Computer networking
 - Information assurance/network security
 - Data structures/database design
 - Web or mobile application design and development
 - Microelectric circuits.

4.2.4c Specialized Digital Forensic Science Courses

A minimum of 6 additional semester hours is required in digital forensic science course work that covers the following topics:

- Acquisition of data
- Network / “live” forensic analysis
- Exploitation of mobile devices

4.2.5 Crime Scene Investigation

These classes shall be consistent with the degree program and shall meet the needs of students specializing in the Crime Scene Investigations sub-discipline of forensic science.

4.2.5a Natural Science Courses

1. **Mathematics:** at least one course (3 semester hours) from the following list:
 - Statistics
 - Trigonometry
 - Geometry

2. Sciences: at least two courses, which include the co-requisite laboratory (minimum 7 semester hours total) from the following list:

- Physical Science
- General Chemistry
- General Biology

4.2.5b Crime Scene Courses

A minimum of 9 semester hours of coursework shall include the following topics:

- Crime scene interface with other forensic disciplines (including recognition and collection of evidence for other disciplines and presumptive testing)
- History and theory of crime scene investigations
- Relevant and current crime scene investigation literature
- Nature and properties of evidence types
- Crime scene safety, security, interactions with police, public, media, and legal
- Crime scene search
- Crime scene equipment, instrumentation, and technologies
- Crime scene interpretation, analysis, and reconstruction
- Crime scene documentation, collection, preservation, and enhancement
- Crime scene and evidence photography and videography
- Report writing and case preparation
- Vicarious trauma and workforce resiliency
- Cognitive bias

4.2.5c Specialized Crime Scene Courses

A minimum of 12 additional semester hours is required in specialized crime scene training that covers at least two of the following topics (It is understood that because of the specialized nature of these course that there should be some form of practical hands-on instruction that could include a laboratory setting):

- Bloodstain pattern analysis and interpretation
- Shooting reconstruction
- Crime scene reconstruction (event analysis)
- Death investigations
- Sexual assault investigations
- Clandestine laboratories
- Fire and explosives investigations
- Crime scenes involving digital evidence
- Latent prints and/or other pattern evidence
- Forensic Pathology
- Forensic Entomology
- Forensic Anthropology/Archaeology
- Accident scene reconstruction
- Wildlife forensics
- Horticultural and agronomy evidence
- Water quality evidence
- Materials analysis evidence (mechanical engineering and stress and failure analysis)
- Behavioral aspects of crime scenes

4.3 Program Director

The program director shall be a full-time faculty member at the academic institution, appropriately qualified to meet the program's stated mission, goals, and objectives, and to provide leadership in forensic science education, research, and other scholarly activities so that students are adequately prepared for forensic science practice.

The program director shall meet the following requirements:

1. **Criminalistics, Forensic Biology, Forensic Chemistry:** a minimum of a Master's or professional degree appropriate for a forensic science program, and at least three years' relevant experience as a forensic science practitioner in an operational forensic science laboratory setting; OR earned doctorate in an appropriate discipline, and three years' experience as an academic forensic scientist that includes appropriate educational, research, and service contributions to forensic science.
2. **Digital Evidence:** a minimum of a Master's or professional degree appropriate for digital forensic science or forensic computer science, and at least three years' relevant experience; OR earned doctorate in an appropriate discipline, and three years' experience as an academic in digital evidence that includes appropriate educational, research, and service contributions to forensic digital evidence.
3. **Crime Scene Investigation:** a minimum of a Master's or professional degree appropriate for crime scene investigation, and at least three years' relevant experience as a crime scene investigator; OR earned doctorate in an appropriate discipline, and three years' experience as an academic in crime scene investigation that includes appropriate educational, research, and service contributions to forensic science.
4. All program directors shall have management experience appropriate to the duties assigned to the position.

5.0 GRADUATE PROGRAM STANDARDS

A graduate forensic science program shall provide advanced education in the scientific, technical and/or laboratory problem solving skills necessary for success in a modern forensic laboratory. Such a program shall combine rigorous scientific, technical and/or laboratory training with exposure to the breadth of forensic science disciplines, including forensic science practice, law enforcement, and ethics.

The graduate forensic science program shall include teaching and learning, research, and service.

5.1 Graduate Admission Requirements

A bachelor's degree in forensic or natural sciences (or its equivalent coursework in a relevant field) shall be required for entrance into the graduate forensic science program. A process shall be in place to evaluate undergraduate work to determine if the applicant has sufficient scientific background to successfully complete the graduate program.

For forensic science programs with an emphasis in digital evidence, a bachelor's degree shall be required for entrance into the graduate forensic science program. A process shall be in place to evaluate undergraduate work to determine if the applicant has sufficient technical background to successfully complete the graduate program.

An exception to the bachelor's degree requirement may include a bachelor's degree/master's degree linked or contiguous program. These programs are sometimes referred to as a 4+1, 3+2, or 5 year program. The program must have well defined admission requirements and defined policies for dual enrollment. With a linked or contiguous program, a student should be able to complete the bachelor's degree without completing the master's degree.

5.2 Curriculum

The graduate program in forensic science shall offer a coherent curriculum that reflects the mission and goals of the program.

5.2.1 General Curricular Requirements

The curriculum shall, at a minimum, ensure that each student:

1. develops an understanding of the areas of knowledge that are essential to forensic science;
2. acquires skills and experience in the application of basic forensic science concepts and of specialty knowledge to problem solving;
3. be oriented in professional values, concepts, and ethics; and,
4. demonstrates integration of knowledge and skills through a capstone experience such as a research thesis or project.

The program shall define clear learning objectives for each discrete component of the curriculum. The program shall have clear procedures for assessing and documenting each student's progress toward the fulfillment of these learning objectives and toward readiness for forensic science practice.

The program shall provide students with the basic knowledge necessary for effective testimony as an expert witness, and each student shall participate in practical experiences where they will render expert testimony (e.g., moot court).

For forensic science programs with an emphasis in biology and/or chemistry, **standard 5.2.2** should be followed. For forensic science programs with an emphasis in digital evidence, **standard 5.2.3** should be followed.

5.2.2 Specific Requirements within the Curriculum for Forensic Science Programs with an Emphasis in Biology and/or Chemistry

The curriculum shall include the following:

5.2.2a Core Forensic Science Topics

The following topics must be part of the curriculum:

1. Crime scene investigation
2. Law/science interface
3. Ethics and professional responsibilities
4. Quality assurance
5. Analytical chemistry and instrumental methods of analysis
6. Drug chemistry/toxicology
7. Microscopy and materials analysis
8. Forensic biology
9. Pattern evidence

The emphasis on each topic should be appropriate in light of the degrees awarded. However, a minimum of nine instructional hours must be spent on each topic.

Normally, a topic will involve multiple class meetings and may involve multiple learning modalities, such as lectures, laboratories, and demonstrations. Evaluation of student mastery of each topic may be conducted through a number of modalities, but the topic material must be specifically addressed in a syllabus and assessed.

5.2.2b Courses in Specialized Areas

The curriculum must include graduate-level science courses appropriate for specialization. For example, courses covering the topics of molecular biology and population genetics, advanced analytical chemistry, toxicology, and materials analysis may be appropriate.

Specialized courses offered may be specific for a track(s) and/or concentration(s) offered by that institution, if applicable.

5.2.2c Graduate Seminar

A formal seminar, presented by a combination of invited experts, faculty, and/or students covering topics such as published work, original research, and other relevant topics must be included within the curriculum of a required course.

5.2.2d Forensic Science Research or Capstone

Each student is required to complete an independent research or capstone project. The research/capstone project shall culminate in a thesis or written report of publishable quality. The academic program must have written guidelines for the format of the thesis/report and for the evaluation of the oral presentation.

Each student is required to have a committee of at least three individuals who are responsible for mentoring the project. One member of the student's research committee must be a full-time faculty member of the program. The other two members can include full- or part-time faculty, forensic practitioners, and others with specialized knowledge. At least one member of the committee must be external to the department sponsoring the research. In addition, each student must present the results of the work orally, in a public forum, before the committee.

Presentations at professional meetings do not meet this requirement.

The research shall be conducted in an environment conducive to research and scholarly inquiry and shall provide the opportunity for faculty and students to contribute to the knowledge base of forensic science, including research directed at improving the practice of forensic science.

5.2.3 Specific Requirements within the Curriculum for Forensic Science Programs with an Emphasis in Digital Evidence

The curriculum shall include the following:

5.2.3a Core Forensic Science Topics

The following topics must be part of the curriculum:

1. Crime scene investigation
2. Law/science evidence
3. Ethics and professional responsibilities
4. Quality assurance
5. Pattern evidence

The emphasis on each topic should be appropriate in light of the degrees awarded. However, a minimum of nine instructional hours must be spent on each topic.

Normally, a topic will involve multiple class meetings and may involve multiple learning modalities, such as lectures, laboratories, and demonstrations. Evaluation of student mastery of each topic may be conducted through a number of modalities, but the topic material must be specifically addressed in a syllabus and assessed.

5.2.3b Courses in Specialized Areas

The curriculum must include graduate-level courses appropriate to digital forensics and should contain the following concepts or topics:

1. Hardware forensics
2. Software forensics
3. Network forensics
4. Mobile device forensics

In addition, specialized courses may be offered, if applicable, in topics to include embedded device forensics, incident response, reverse engineering, multimedia forensics, information security, and/or operational management.

An advanced digital forensics course that requires a graduate course as a prerequisite must be completed.

5.2.3c Graduate Seminar

A formal seminar, presented by a combination of invited experts, faculty, and/or students covering topics such as published work, original research, and other relevant topics must be included within the curriculum as a required course.

5.2.3d Digital Evidence Research or Capstone

Each student is required to complete an independent research or capstone project. The research/capstone project shall culminate in a thesis or written report of publishable quality. The academic program must have written guidelines for the format of the report and for the evaluation of the oral presentation.

Each student is required to have a committee of at least three individuals who are responsible for mentoring the project. One member of the student's research committee must be a full-time faculty member of the program. The other two members can include full- or part-time faculty, forensic practitioners, and others with specialized knowledge. At least one member of the committee must be external to the department sponsoring the research. In addition, each student must present the results of the work orally, in a public forum, before the committee. Presentations at professional meetings do not meet this requirement.

The research/capstone project shall be conducted in an environment conducive to scholarly inquiry and shall provide the opportunity for faculty and students to contribute to the knowledge base of forensic science, including research/capstone projects directed at improving the practice of forensic science.

5.3 Program Director

The program director shall be a full-time faculty member at the academic institution appropriately qualified by academic experience, research qualifications, and background in program administration to meet the program's stated mission, goals, and objectives, and to provide leadership in forensic science education, research, and other scholarly activities so students are adequately prepared for forensic science practice. The program director shall meet the following requirements:

1. a minimum of an earned Doctorate degree appropriate for a forensic science program;
2. at least five years relevant experience as an academic forensic scientist that includes appropriate educational, research, and service contributions to forensic science; OR at least five years relevant experience as a forensic science practitioner, not including any training time in an operational forensic science laboratory setting;
3. documented research experience in a forensic science discipline or in methods and techniques adapted, validated, and implemented by the forensic science community; and
4. documented management experience appropriate to the duties assigned to the position.