

**COLLEGE OF SCIENCE & LIBERAL ARTS**

Office of the Dean

Bachelor of Science in Forensic Science  
Response to External Consultant's Report  
March 15, 2018

---

The College of Science and Liberal Arts would like to thank Dr. Glen Jackson, Ming Hsieh Distinguished Professor in the Department of Forensic & Investigative Science and the C. Eugene Bennett Department of Chemistry at West Virginia University for his thoughtful review of our proposed Bachelor of Science degree program in Forensic Science. Dr. Jackson's scholarly background in the administration of forensic science programs as well as his program of research in analytical forensics render him the ideal consultant in order to provide feedback and guidance in proposing and enrolling the new program.

We are pleased with his overall recommendation of approval for the program, and we appreciate his positive observations as well as his constructive feedback. Below we respond to his suggestions and observations, as articulated in his original report ("Suggestions for Program Improvement," External Consultant Report, pp. 3-4). Dr. Jackson's feedback, which includes 11 items, has been grouped thematically, thus allowing a thoughtful and thorough response while eliminating redundancies. The parenthetical citations correspond to the number assigned by Dr. Jackson to each item in his report.

Academic Personnel and Support Staff

- i. Program Administration & Director (#1)
- ii. Forensic Science Faculty (#2)
- iii. Forensic Science Academic Support Staff (#3)
- iv. Learning Communities (#5)
- v. Contribution from Full-Time Instructional Staff (#11)

Facilities and Infrastructure

- i. Administrative Home for the Space (#4)
- ii. Lab Renovation & Capital Improvement (#6)

Assessment and Curriculum

- i. FSAT Cost Budgeting (#7)
- ii. Option Nomenclature (#8)
- iii. Coursework in Forensic Serology (#9)
- iv. Number of Lab Hours in Forensic Science Core (#10)
- v. Alternative Degree Programs

## Academic Personnel and Support Staff

### Program Administration & Director (#1)

We concur with Dr. Jackson's recommendation to "appoint a [Program] director who has the necessary expertise to help the Program succeed and acquire FEPAC accreditation" (External Consultant Report, p. 3). In order to address this need, the Department of Chemistry & Environmental Science is currently conducting a search for a Professor of Practice to serve as the director of the Program:

- i. Professor of Practice in Forensic Science (full-time, non-tenure-track) to serve as the director of the Forensic Science Program. Reports to the chair of the Department of Chemistry & Environmental Science. Key responsibilities include advising, assessment, faculty and student recruitment, industry engagement, and professional outreach. Teaching load is two forensic science core courses per semester. Appointment is renewable annually.

The Professor of Practice in Forensic Science search has been approved by Provost Deek and will begin accepting applications as soon as the job ad has been posted to the university's employment opportunity website (the requisition is currently undergoing internal approval).

### Forensic Science Faculty (#2)

Dr. Jackson also suggests adding "one or two core forensic science faculty (may include the Program director)" (External Consultant Report, p. 3). In addition to the Professor of Practice position outlined above, the Department of Chemistry & Environmental Science is conducting an additional faculty search with implications for the Program:

- i. Open rank tenure-track position in the area of analytical chemistry with a leading interest in forensic analysis, separations, spectroscopy, or microscopy, with an expected starting date in the fall of 2018. The successful candidate is expected to establish an active, externally funded research program and to demonstrate excellence in graduate and undergraduate teaching, particularly in analytical chemistry and forensic analysis related courses.

In anticipation of the forthcoming forensic science degree program, the search for the open rank tenure-track faculty position in analytical chemistry was approved and began accepting applications at the beginning of the 2017-2018 academic year. As of March, 2018, the analytical chemistry search committee has concluded on-campus interviews and has invited a senior-rank candidate back to campus for a second visit. Taken together, the two new faculty positions in forensic science will more than address the Program's administrative and leadership needs as identified by Dr. Jackson in his first two suggestions.

### Forensic Science Academic Support Staff (#3)

Dr. Jackson identifies the need for additional academic support staff in the areas of advising and internship coordination if Program enrollment is substantial. We agree with this recommendation, and the Program's needs will be continually assessed in order to best serve our students. At the onset, the director (i.e., the Professor of Practice in Forensic Science) will serve as the Program's chief academic advisor and internship coordinator. As such, the position's prerequisite qualifications include a minimum of 10 years' experience in forensic or investigative science or law enforcement, prior teaching experience (preferably at the university level), and expertise in curriculum development, program assessment, and/or regulatory compliance. Taken together, these qualifications will allow the director to successfully guide students towards degree completion and to rely on a professional network of forensic experts in order to provide students with relevant internship opportunities. That said, when the Program reaches target enrollment (i.e., 70 students) additional hires in advising or instructional staff may be necessary. Per current projections, we expect that the Program will reach target enrollment by its fifth year (i.e., the 2022-2023 academic year), by which point additional hiring needs will be assessed and resourced accordingly.

### Learning Communities (#5)

Dr. Jackson's recommendation to create a forensic science learning community is well taken, as the learning community model has been institutionalized university-wide at NJIT. Thus, a forensic science learning community is a realistic and likely possibility as the Program begins to enroll students. Founded as a student success initiative, NJIT's learning communities are administered by the Director of Learning Communities, who serves as a direct report of the Vice Provost for Undergraduate Studies. The Director of Learning Communities works directly with program directors and academic advisors in order to implement best practices.

Students are enrolled in learning communities by degree program beginning with FRSH SEM: Freshmen Seminar, which all first-year students complete during their first semester, in addition to the introductory core courses in their disciplines. Learning communities sections of HUM 101 and HUM 102, the university's introductory composition sequence, are also common. Furthermore, peer leaders are assigned to learning communities in order to provide guidance, address students' concerns, and answer any questions that may arise during their first year at NJIT. Peer leaders are typically upperclassmen in the degree programs they serve. Thus, the Program may source peer leaders from related disciplines (e.g., chemistry, biochemistry, etc.) at first.

### Contribution from Full-Time Instructional Staff (#11)

Dr. Jackson's suggestion to monitor continuously "the contribution of full-time PhD faculty to ensure the Program maintains alignment with FEPAC standards" (External

Consultant Report, p. 4) pertains to the criteria for accreditation as articulated by the accrediting agency (i.e., the Forensic Science Education Programs Accreditation Commission [FEPAC]). Per FEPAC's accreditation standards (FEPAC Accreditation Standards, 2017, p. 7):

- i. At least 50% of the full-time forensic science faculty shall have an appropriate doctoral degree.
- ii. At least 50% of the forensic science credit hours in a program must be taught by full-time faculty.

We will strictly observe these criteria, as it is our intention to apply for accreditation as soon as the Program is eligible.

### **Facilities and Infrastructure**

#### **Administrative Space for the Program (#4)**

Dr. Jackson recommends that we identify “an independent space to be an administrative ‘home’ for the Program” to serve as a resource center and to help with branding as well as creating a sense of identity among affiliated faculty and students. At present, the administrative office of the Department of Chemistry & Environmental Chemistry will serve these purposes. However, depending upon the needs of the Program, the creation of an independent administrative space for the Program will be taken into consideration as the Program begins to enroll students and grows.

#### **Lab Renovation & Capital Improvement (#6)**

The Department of Chemistry & Environmental Science and the Office of the Dean of the College of Science and Liberal Arts have submitted to the university a lab renovation proposal (“Forensic Analysis and Biochemistry Laboratory Renovation Initiative”) for next fiscal year’s (i.e., FY19) capital budget. The renovation and equipment procurement will upgrade existing lab space in order to provide a state-of-the-art instructional laboratory to support the Program. While the FY19 budget will not be finalized until mid-summer, the Provost Deek has enthusiastically supported the proposal and has indicated that the renovation of this lab has been placed on the approved list of capital improvement projects for FY 19.

## Assessment and Curriculum

### FSAT Cost Budgeting (#7)

The Forensic Science Assessment Text (FSAT) will be administered to all graduating seniors. The cost of the exam is \$75 per student. Per Dr. Jackson's recommendation, the cost will be built into the Program's budget beginning FY20, thereby alleviating the students of the cost burden.

### Option Nomenclature (#8)

The Program, in its current form, is comprised of two options, from which students must choose one: (a) forensic biochemistry and (b) forensic chemistry. As stated in the External Consultant Report, "[b]oth options require 120 credits, and they only differ by 20 credits of the specialized courses required for each option" (p. 10). We appreciate Dr. Jackson's thoughtful suggestion that the forensic biochemistry option be renamed "forensic biology," but, after considerable deliberation, we believe that—*for the time being*—the original name is the most appropriate one for the option as there is at least one FEPAC-accredited Forensic Science program that has a track entitled forensic biochemistry.

The curriculum for the forensic biochemistry option is based, in large part, on the Department of Chemistry & Environmental Science's Bachelor of Science in Biochemistry. Furthermore, NJIT's Department of Biological Sciences has its roots in ecology, evolution, and neurobiology; that said, courses in cell and molecular biology (e.g., BIOL 352: Genetics) have been added to the university's course catalog in recent years. If the Department of Biological Sciences continues to add courses and hire faculty in the area of cell and molecular biology, we will explore the possibility of renaming the forensic biochemistry option.

### Coursework in Forensic Serology (#9)

We agree with Dr. Jackson's recommendation to develop and offer a "[f]orensic DNA class to provide the discipline-specific expertise in DNA analysis" (p. 11), and we will explore this option as the program is enrolled, developed, and grows. There is already faculty interest in developing such a course. Dr. Yong-Ick Kim, Assistant Professor in the Department of Chemistry & Environmental Science, has expressed enthusiasm at the idea of developing and teaching the course, for which his background in biochemistry makes him an excellent candidate. When developed, the course will be offered as an upper-level elective in the Forensic Biochemistry Option, which requires students to complete 10 credit hours of disciplinary specific advanced coursework. All students expressing an interest in working as a DNA analyst will be advised to take the course.

Dr. Jackson also observes that, for students seeking employment as DNA analysts, “it is not clear if population genetics is covered in sufficient detail in the listed courses.” The development of a forensic DNA and serology course would certainly cover this topic in sufficient detail. However, per course syllabi, population genetics is covered in many of the existing required courses and upper-level electives in the curriculum for the forensic biochemistry option:

- i. BIOL 205: Foundations of Biology: Ecology and Evolution: the origin of genetic variation; population genetics; and the Hardy-Weinberg equation.
- ii. BIOL 206: Foundations of Biology: Ecology and Evolution Lab: genetic changes in model populations.
- iii. BIOL 352: Genetics: Molecular genetics: Mitochondrial DNA and extra nuclear inheritance; and epigenetics.
- iv. R120.452: Lab in Cellular and Molecular Biology: Molecular Biotechniques: DNA isolation, quantitation, and characterization; PCR; analysis of PCR results; plasmid isolation, quantification, and characterization; and plasmid isolation and characterization.

#### Number of Lab Hours in Forensic Science Core (#10)

Dr. Jackson’s final suggestion is to “identify the number of laboratory hours that are covered in the forensic science core courses” (External Consultant Report, p. 4). This suggestion is made in service of FEPAC accreditation, which specifies that the curriculum must include a minimum of 15 credit hours in forensic science coursework, 9 credit hours of which must include courses in forensic chemistry, forensic biology, physical methods, or microscopy *and* contain a laboratory component (FEPAC Accreditation Standards, 2017, p. 11). To that end, the number of laboratory hours that are covered in each of the forensic science core courses is outlined below in Table 1. As one can see, our program exceeds the laboratory requirements of FEPAC by one credit hour.

*Table 1. Forensic Science Core Courses: Lab Credit Hours by Course*

| Course   | Credit Hours |       |
|--|--------------|-------|
|  | Lab          | Total |
| <i>FRSC 201: Introduction to Forensic Science</i>    | 0            | 3     |
| <i>FRSC 307: Crime Scene Investigation &amp; Lab</i> | 1            | 4     |
| <i>HIST 320: Law &amp; Evidence</i>                  | 0            | 3     |
| <i>FRSC 359: Physical Methods of Analysis</i>        | 3            | 4     |
| <i>FRSC 475: Forensic Chemistry</i>                  | 3            | 4     |
| <i>FRSC 480: Forensic Microscopy</i>                 | 3            | 4     |
| <b>TOTAL</b>   | 10           | 22    |

## Alternative Degree Programs

Although not identified explicitly in the “Suggestions for Program Improvement,” Dr. Jackson raises concerns about alternative degree options for students who wish to transfer out of the Program. Specifically, he writes :

In terms of retention and graduation at the college or university level, students must be advised about suitable alternative majors that make the best use of their completed courses. For advising purposes, I recommend identifying some specific alternative majors for students who wish to leave the BSFS major. (p. 9)

To this end, we’ve identified numerous alternative programs for forensic science students who, for whatever reason, might wish to change majors:

- i. Bachelor of Arts in Biology (123 credit hours): This program may be a good alternative for students with a broader interest in the natural sciences as opposed to a specialized, technical, or applied subject interest. Furthermore, nearly all of the courses that students take during the first two years of the Bachelor of Science in Forensic Science Program can be applied toward degree progress in the Bachelor of Arts in Biology, which keeps students on track to graduate on time.
- ii. Bachelor of Arts in Law, Technology, & Culture (120 credit hours): This program is a good alternative for students whose interests may better align with criminology rather than analytical forensics. The Law, Technology, & Culture major prepares students for careers in law, law-related areas of business and government, as well as graduate study in various disciplines. The curriculum includes an interdisciplinary curriculum focused on law in relation to technology, media, environment, health, and culture. Students transferring to this degree program may also choose to pursue a minor in the Program, which will allow them to continue to explore their interest in forensics, but to better tailor the experience to their unique talents and interests.
- iii. Bachelor of Science in Science, Technology, & Society (121 credit hours): This program is a good alternative for students more interested in the social science dimensions of forensics. Students majoring in Science in Science, Technology, & Society explore the theoretical and historical foundations of science and technology as they relate to politics, social structure, economics, and culture. Students specialize in one of five areas of advanced coursework: mind, behavior, & society; environmental & sustainability studies; race/gender in science & technology; politics, history, & ethics in science & technology; or music, literature, & culture in technological society.