

# HANDBOOK FOR STUDENTS

**2023-2024**

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MASTERS IN FORENSIC SCIENCE PROGRAM

Department of Sciences, John Jay College of Criminal Justice, CUNY



The information contained in this handbook is current as of the 2023-2024 Academic Year and is supplementary to the information and regulations contained in the *CUNY Bulletin, Student Handbook* and *Bylaws and Governance of John Jay College of Criminal Justice-CUNY*.

**Disclaimer: This handbook is provided to the incoming graduate student attending the John Jay College of Criminal Justice-CUNY Master of Science Program in Forensic Science. While every effort is taken to keep all information current, the student is responsible for verifying all information and referring to the College for any changes to procedure that have not made it into this Handbook. This Handbook is provided by the Graduate Program Director and is intended to supplement, not replace, official College documents such as the Graduate School Bulletin. In the event that the student finds content of this Handbook to be incorrect, outdated, ambiguous or otherwise contradictory to College policies, the student is to rely on the Graduate School Bulletin and any official College documentation. Students are encouraged to bring any errors, omissions or changes to the Program Director so that the Handbook may be updated accordingly.**

**Edited by Mechthild Prinz & Lindsay Lerner, July 2023.**

## **Governing Structure for the Master of Science Program in Forensic Science and**

### **Administration of the Graduate Program**

The Dean of Academic Programs oversees curriculum development for the different Graduate Programs and chairs the Committee on Graduate Studies.

The Committee consists of the Dean of Academic Programs (Chairperson), the Dean of Students, the Vice President of Enrollment Management, the Chief Librarian, the Graduate Program Directors, the Forensic Psychology BA/MA Director and two graduate students. The Committee is responsible for establishing general policy for the Graduate Program, which is subject to review by the College Council. The Committee has primary responsibility of admissions, curriculum, degree requirements, course and standing matters, periodic evaluation of the Graduate Program and other areas of immediate and long-term importance to the quality and growth of the Graduate Program in Forensic Science. Responsibilities of the Committee also include advising on all matters pertaining to graduate student honors, prizes, scholarships and awards. The Program Directors are also the academic and professional advisors on course requirements, scholarship issues, thesis related issues, the selection of thesis advisors, opportunities for advanced graduate work, and career opportunities and requirements.

# Introduction

The degree of Master of Science (M.S.) is an advanced degree awarded to an individual who has successfully completed a specific program of study. The Forensic Science Master's program at John Jay College of Criminal Justice-City University of New York (CUNY) includes the completion of a series of specific, rigorous graduate-level courses followed by completion of a research-based thesis on a topic relevant to the field of forensic science.

Forensic science is generally described as the application of the natural sciences to matters of the law. Forensic science is unique in that it encompasses many different areas of study and contains several sub-specialties, all of which interact with law enforcement and the legal system. The scientific method is a theoretical and analytical approach routinely used in scientific discourse, including forensic science. In the mid-20th century, Hans Gross coined the term "Criminalistics," which has become generally accepted in the forensic profession as including the scientific study and research of physical evidence in both public and private "crime laboratories." The American Academy of Forensic Sciences (AAFS) has ten separate sections of which Criminalistics is the largest, accounting for approximately 40% of the Academy's membership.

The Master of Science in Forensic Science (MS-FOS) degree program at John Jay College of Criminal Justice-CUNY was established in 1968 and has been developed and maintained by highly respected and internationally recognized faculty. This faculty encompasses a wide range of expertise in both general physical and biological sciences and specific forensic disciplines. The Masters program is an eclectic program designed to provide graduate level education to individuals wishing to become scientists, administrators, laboratory directors, educators and professionals in a number of forensic science sub-specialties. The program draws from several areas of the hard sciences, including biology and molecular biology, organic, physical and analytical chemistry, physics and analytical methods such as microscopy and instrumental analysis. In addition, the program addresses current issues and trends in forensic science and includes courses on law and legal issues, ethics, and statistics. Furthermore, the program focuses on forensic science and research, providing both classroom and laboratory experience. It involves the mastery of techniques routinely employed in both the laboratory and the court. The curriculum is designed to meet the urgent national need for personnel adequately trained to conduct casework analysis in crime laboratories as well as personnel that oversee and supervise the crime laboratories.

The Master of Science program is based upon approximately 40-45 credits of courses and the writing of a research-based thesis. The program offers three specializations: Criminalistics, Forensic Toxicology, and Molecular Biology. All students are required to take a series of required courses followed by a selection of courses specifically geared towards the student's selected

specialization. The required core classes are designed to cover fundamental concepts relevant to general forensic science. Students in the Criminalistics specialization take a series of advanced criminalistics courses that cover the fundamental principles and concepts in the analysis and evaluation of trace evidence and physiological fluids. The students in the Forensic Toxicology specialization take a series of courses concerned with the biochemical activities of drugs and poisons and the use of chemical techniques to isolate and identify these types of materials. Finally, students in the Molecular Biology specialization take courses based upon genetics and forensic applications of molecular biology, with a focus on the isolation, analysis and typing of DNA.

A variety of electives are offered in order to provide a well-rounded course of study that introduces the student to the identification and analysis of different types of evidence, analytical techniques in a forensic laboratory, and additional forensic sub-disciplines (such as crime scene investigation, forensic anthropology and firearms analysis). The thesis requirement involves the student working under the tutelage of a faculty member to conduct research in a forensic field. The research culminates in the writing of and approval of a thesis. The student is guided through the research process with the assistance of required courses and academic advisement. The goal of preparing and writing a thesis is for the student to both present and publish their research in a forensic science forum, which will ultimately benefit the student's professional development and help to establish them in the field of forensic science.

# General Requirements for Admissions

## **Requirements:**

The following is a list of requirements for admission into the Master of Science in Forensic Science (MS-FOS) program at John Jay College of Criminal Justice-CUNY:

1. A baccalaureate degree or equivalent from an accredited institution
2. A minimum undergraduate grade point average (GPA) of 3.0 or equivalent overall and specifically in natural science and math courses.
3. The successful completion of the following undergraduate STEM coursework: two semesters (one year) of general biology, general chemistry, organic chemistry, physics and calculus, and one semester of biochemistry, and statistics. In some instances, applicants may be required to provide information about undergraduate courses (such as a syllabus or course outline) in order to establish that the content is equivalent to a prerequisite. Students who are deficient in no more than three courses may qualify for conditional acceptance.

Applicants who did not complete their undergraduate degree at an English-speaking institution are required to submit the Test of English as a Foreign Language (TOEFL) score report. John Jay College's TOEFL code number is 2115-99. The required minimum TOEFL scores are 550 for the paper-based test, 213 for the computer-based test and 79-80 for the Internet-based test. Students can also take the International English Language Testing System (IELTS). A score of 70 is required on the IELTS.

## **Admissions Status:**

There are two categories of graduate students- matriculated (or fully matriculated) and matriculated with conditions (or, conditional matriculation). An applicant may be admitted to the graduate program under one of these two categories:

1. Fully matriculated students are those that have fulfilled all general and specific requirements for admission into the graduate program.
2. Conditionally matriculated students are those that have deficiencies in their undergraduate coursework, but who otherwise are qualified for admission into the graduate program. Such deficiencies must be removed upon completion of no more than three classes.

## Full-Time/Part-Time Status

In order to be considered a full-time graduate student, students must register for a minimum of 9 credits per semester. However, a minimum of 12 credits per semester is still required for in-state students to receive flat rate tuition. Please see the 'Tuition and Fees' section of this bulletin for more information.

A part-time student registers for fewer than 9 credits per semester.

# Registration Information

## **General Procedures:**

Students register for classes using the College's online registration tool, CUNYfirst (<https://cunyfirst.cuny.edu>). Prospective and new students are referred to the John Jay College Student Info center (<http://jstop.jjay.cuny.edu/>) for information on registration, fees, financial aid and access to CUNYfirst. New graduate students will receive an invitation to an academic advisement session prior to registration and a new student orientation immediately preceding the semester in which they plan to begin their studies. The date, time and location of the orientation can also be found on the John Jay website (<http://www.jjay.cuny.edu/student-orientation>). The student is responsible for any fees pertaining to college tuition and enrollment in addition to any fees incurred for late registration. It is the student's responsibility to contact the Colleges Offices of the Registrar, Bursar, and Financial Aid as needed.

## **Late Registration:**

Students who register for courses during late registration are responsible for all work assigned from the beginning of the term; they are also subject to the instructor's attendance policy, beginning with the first class meeting of the semester. Syllabi may be reviewed in the Office of Graduate Studies, enabling late registrants to purchase texts and complete first and second week assignments.

## **Resignation and Change of Program:**

A student who is unable to meet attendance requirements may, by written application, request permission to resign from a course. The course withdrawal online application is on the Jay Stop website <http://jstop.jjay.cuny.edu>. Please see the academic calendar for the last day to submit a withdrawal request. The form is accessible daily from 6:00 AM to 8:00 PM.

Before the first day of the semester and during the Program Adjustment Period (the first three weeks of the semester), all resignations will be processed in accordance with the College's change of program procedures under which courses may be dropped and added. Refunds will be made according to the refund schedule listed in the section of the graduate bulletin titled Tuition and Fees.

Beginning with the fourth week and continuing through the tenth week of the semester, students may resign without academic penalty by filing an Application for Resignation, signed by the instructor or the Dean of Graduate Studies. The final date of this period is published in the Academic Calendar each semester.



Requests to resign after the tenth week must be filed at Jay Express Services Center and must include the signature of the instructor as well as medical, occupational, psychological, or other appropriate documentation. Such resignations must be approved by the Vice President for Enrollment Management. If approval is denied and the student does not complete the course in question, he or she receives a grade of WU, which is the equivalent of an F.

In rare circumstances, students can apply for a retroactive resignation from courses taken in the previous semester. However, such resignation must be for all courses taken in that semester and must be based on special hardships, substantiated by appropriate documentation. Under no circumstances will a retroactive resignation from an entire semester be allowed more than once in a student's graduate course of study. Applications for retroactive resignation may be obtained at the Jay Stop website: <http://jstop.jjay.cuny.edu>. All resignations are subject to final authorization by the Registrar.

### **Procedure for Official Withdrawal:**

1. Officially withdraw from all your classes via your CUNYfirst account before the deadlines published in the relevant academic calendar.
2. Notify your professors via email
3. Notify Dr. Concheiro-Guisan via email
  - a. Note: If you do not officially withdraw before the deadline, you risk receiving a 'WU' grade, which has the same impact on your GPA as an 'F' grade. Please remember that graduate student must maintain a minimum GPA of 3.0 in order to remain in good academic standing.

### **Transfer Credits:**

Matriculated students may apply for up to 12 transfer credits for prior graduate work at accredited colleges, provided the courses were completed with a grade of B or higher within an appropriate time preceding the time of application. Courses taken more than seven years preceding the time of graduate application for admission will be accepted only in exceptional circumstances.

Credits must be approved by the program director of the respective degree program. Students must list the courses taken at the other institution(s) and must also submit the course description from the college catalog. Forms are available on the Jay Stop website.

A request for transfer of credit should be filed during the first semester a student attends the graduate program. The program director must submit the completed form to the Office of the Registrar.

**Independent Studies:**

Students are limited to one independent study course in the graduate program. To register for an independent study course, a student must have completed twelve or more graduate credits with a minimum grade point index of a 3.30. Students must also complete the Independent Study Course Request Form, which is available on the Jay Stop website: <http://jstop.jjay.cuny.edu/registrar.php>

## Requirements for the Program:

### General Degree Requirements:

**Dismissal and Probation.** Graduate students must maintain a 3.0 average. All student transcripts are reviewed after the end of each semester. A student whose grade point average falls below 3.0 is subject to probation or dismissal. Those placed on probation should discuss their standing with their program director or the Dean of Graduate Studies.

**Academic Integrity.** Academic dishonesty is prohibited in the City University of New York and is punishable by penalties including failing grades, suspension and expulsion. Students should consult the Graduate Bulletin for the complete text of John Jay College's Policy on Academic Integrity.

**Retention Standards.** If, after completing twelve credits including any prerequisites, conditionally matriculated students that achieve an overall average of B or better and have met all other admissions requirements will become fully matriculated and be considered degree candidates.

**Time Limit.** All Master's degree requirements in a specific program must be completed within eight years of the date of entrance into the program. A student may refrain from matriculating for no more than four semesters within this eight-year period. Any exceptions to this rule must be based on very compelling extenuating circumstances and must be approved by the Dean of Graduate Studies or the Vice President for Enrollment Management.

**Readmission.** A student in good standing (i.e. with a GPA above 3.0), who has not registered for one or more (consecutive) semesters, is required to file an application for readmission at least one month before the beginning of the registration period. The Graduate readmissions application is available in person at the Office of Jay Express Service Center and online on here:

<https://doitapps2.jjay.cuny.edu/readmission/index.php>. Completed applications with appropriate fee (\$20) in cash (in-person only), check, or money order can be submitted to the Office of Jay Express Service Center. Readmitted students may be subjected to any changes in the program requirements that are made during the student's absence. Students that left the College with a GPA below a 3.0 may apply for reinstatement, but are not assured of acceptance.

**Maintenance of Matriculation.** Students must register for courses or maintain matriculation status in the semester in which they file for and obtain their degree. Students not taking courses must register to maintain matriculation (MAM 791) in order to remain on the active rolls of John Jay College. Students who have not maintained active status for one semester or more must apply

for readmission. In order to comply with the CUNY Board of Trustees reporting and funding requirements, all maintenance of matriculation fees must be received by the end of the second week of classes.

**Graduation Requirements.** Candidates for graduation must have all degree requirements completed by the end of the semester in which they plan to graduate. An Incomplete grade in a course will result in removal from the list of graduates. Students will also be barred from graduation if they have outstanding Lloyd George Sealy Library or CUNY Interlibrary fines. Application for Graduate Degree must be filed on CUNYFIRST according to the date listed in the Academic Calendar (<https://www.jjay.cuny.edu/academic-calendar>.) Please check the Registrar website for Graduation deadlines

Please note that all graduating students must apply for graduation. THIS IS NOT AUTOMATIC.

The website for instructions on how to file for graduation is located here:

<https://www.jjay.cuny.edu/apply-graduation> or [follow the steps below.](#)

1. Log into your CUNYFirst account at <https://home.cunyfirst.cuny.edu/>
2. Go to Student Center
3. Under Academics, click the "Other Academics" drop-down box near your class schedule.
4. Click "Apply for Graduation."
5. Make sure you are applying for the correct program
6. Select the term you want to apply for, then click continue
7. After that click "Submit Application"

**Commencement.** Participation in the annual spring commencement ceremony is accorded to students who have been awarded the master's degree the previous August or February and students who are certified by the Registrar's Office to complete their degree requirements by the end of that spring semester. Students planning to complete their degree requirements at the end of the summer session may participate in the annual commencement ceremony provided they have submitted an application for graduation by the deadline date, have two courses or less left to

complete their degree (certified by the Registrar's Office) and are currently registered for those courses in the summer session

### **Course Load and Grading:**

**Credit Load.** Full-time graduate students normally register for 9 credits or more per semester; part-time students normally take 6 credits per semester. Students employed full-time are advised to limit themselves to no more than 6 credits per semester. Students matriculated-with-conditions are expected to take 6 credits per semester. In exceptional circumstances, students may exceed or fall short of these limits with the permission of a graduate program director or the Dean of Graduate Studies.

No student may register for more than 60 graduate credits during their graduate course of study at John Jay without the approval of the Dean of Graduate Studies and the Vice President for Enrollment Management, and then may only register for courses needed for graduation. In addition, no student may register for more than 15 credits in a given semester without the approval of the Dean of Graduate Studies.

**Grades.** The following grades are used in the Graduate Program:

| <b>Grade</b> | <b>Explanation</b> | <b>Index Value</b> |
|--------------|--------------------|--------------------|
| A            | Excellent          | 4.0                |
| A-           |                    | 3.7                |
| B+           |                    | 3.3                |
| B            | Good               | 3.0                |
| B-           |                    | 2.7                |
| C+           |                    | 2.3                |
| C            | Unsatisfactory     | 2.0                |
| C-           |                    | 1.7                |
| F            | Failure            | 0.0                |
| P            | Pass               | -                  |
| INC          | Incomplete         | -                  |

\*Note: No grade can be eliminated from the grade point average by retaking the course

**An F grade** is used for students who have been doing unsatisfactory work and who resign from a course after the tenth week of the semester. (For the exact date in any given semester, please see "Last Day to Resign without Academic Penalty" in the Academic Calendar on the John Jay website: [www.jjay.cuny.edu](http://www.jjay.cuny.edu)). This grade may also be awarded for excessive absences, or for very unsatisfactory work, or for student withdrawal without official approval. The grade of F on the graduate level can be eliminated from the GPA calculation by retaking the course with a grade of

C- or better, but a record of the original grade remains permanently in the student's academic records. If the F grade was received for a required course, the student must retake the course. This policy is active for all courses taken after Fall of 2022. Classes taken prior to Fall of 2022 are not subject to this policy.

**A grade of INC** is given in lieu of a grade only in exceptional circumstances for students who have been doing satisfactory work and have been unable to complete course requirements. Students who receive an Incomplete must fulfill their academic obligation within one calendar year of the end of the semester in which the grade of Incomplete is given. In extraordinary circumstances and with the approval of the Dean of Academic Programs or the Vice President for Enrollment Management, the time limit may be extended one additional year. Incompletes unresolved in the above-mentioned time period become permanent entries in students' records as an Incomplete (no-credit) and may not be changed thereafter. A maximum of three grades of Incomplete may be converted to regular grades during the course of a student's enrollment in graduate studies at John Jay College. In rare circumstances, more than three grades of Incomplete may be converted to regular grades with the approval of the Dean of Graduate Studies or the Vice President for Enrollment Management. Incomplete grades that are not resolved within the above-mentioned time period become permanent Incompletes. Such grades will not be counted in the student grade point average. No credit is awarded for Incompletes that have not been appropriately resolved.

### **Grade of W (Withdrawal)**

This grade indicates withdrawal with permission of the Registrar while students are doing satisfactory work. Normally this can be done only through the tenth week of the semester. This withdrawal is without academic prejudice.

Graduate students who receive loans or other forms of federal financial assistance should check with the Financial Aid Office before withdrawing from courses.

### **Grade of WN (Withdrawal – Did Not Attend)**

This grade is calculated the same as a W grade and is assigned by the instructor when the instructor has no record of the student attending the course for the semester.

### **Grade of WU (Withdrew Unofficially)**

The grade of WU is assigned by the instructor when a student has ceased attending class and has not submitted an Application for Resignation. The grade is computed as a failure (0.0) in the grade

point average (GPA), which may result in the adjustment of financial aid funds. Students who want to withdraw from a class are therefore advised to submit an official Application for Resignation online via Jay Stop (<http://jstop.jjay.cuny.edu>) prior to the end of the tenth week of classes.

**Change of Final Grade.** Application for a change of grade assigned by a member of the Faculty may be made at any time within one year from the end of the semester in which the course was taken. This request may be made by either the student or the instructor. The procedures outlined below apply to the change of grades of A, A-, B+, B, B-, C+, C, C- and F.

1. **Grade Appeal.** An appeal of a final grade must be filed by the 25th calendar day of the subsequent long semester. (Grades for courses taken in the spring or summer must be appealed by the 25th calendar day of the fall semester; grades for courses taken in the fall or winter must be appealed by the 25th calendar day of the spring semester). To appeal a final grade of A, A-, B+, B, B-, C+, C, C- or F, a student should first meet with the faculty member to discuss the final grade. If an agreement is reached, the instructor is responsible for submitting the Change of Grade form to the Registrar's Office. If, after consultations with the faculty member, the final grade is reaffirmed, a student who questions the grade should consult his or her program director. If this does not resolve matters, the student has the right to appeal.
  - a. To file a grade appeal, the student should complete a grade appeal form available from the Office of the Dean of Graduate Studies. The form requires the specification of reasons for the appeal. Students must provide a copy of the course syllabus, all available graded course materials and any supporting documentation, such as the midterm, final exam and research papers. Upon receiving a grade appeal request, the Dean will convene the indicated program's grade appeal committee to hear the appeal. The committee has thirty calendar days to hear the appeal. The decision of the committee will be communicated in writing by the Chair of the grade appeal committee to the Dean who will inform the student, faculty, and Registrar of the decision. The decision of the subcommittee is final.
2. **Class Attendance.** Class attendance and participation are factors in assessing student performance. Faculty will advise students at the beginning of the semester of the requirements for attendance.

### **Degree Requirements:**

Program requirements consist of 41-43 credit hours. Core courses provide the student with the knowledge and skills required of crime laboratory analysts; elective courses, coupled with research experience, provide training in more specialized areas such as microspectrophotometry, forensic anthropology, and forensic entomology. All students are required to write a thesis. There are no alternatives.

### **Advisement of Students:**

Upon acceptance into the program, the student should make an appointment with the program director to advise them on their course of study. The program director will work with the students on the optimal course sequence based on the student's schedule (full time versus part time), any missing pre-required undergraduate coursework, and the desired specialization. At a minimum, the student should meet with his or her academic advisor towards the end of each semester to get course advice for the coming semester.

### **Master Thesis:**

In order to not delay graduation, a student should start inquiring about MS-FOS faculty research and searching for a thesis advisor during the first year of study. The thesis advisor will guide the student through their research project, serve as the thesis committee chairperson and keep the Program Director informed about the student's progress.

Students must successfully complete the Thesis Prospectus series (FOS795-797) in order to be allowed to submit the thesis. This series of classes will introduce students to research related topics and available resources.

There is a separate Master Thesis Guide for detailed information on the thesis process. To access this guide please click the Thesis Prep/Requirements tab on the program's website.



## Additional Program Information:

### On Campus Employment:

John Jay College job postings, typically for part time college assistants (use this as search term) can be found on the CUNY website: <http://www.cuny.edu/employment/student-jobs/>

In addition to these John Jay College employment opportunities, the Sciences Department may be looking for qualified undergraduate course technicians or instructors for fall, spring, and summer semesters. Please contact the Program Director to obtain more specific information.

### Student Travel:

There is no better way to learn about the field of Forensic Science and build a network of colleagues or potential employers than attending a scientific meeting. Graduate students with at least a 3.0 GPA who have completed at least 12 credits are eligible to apply for John Jay College Student travel funds. These funds (up to \$1,500) are seem to be given on a first come first serve basis either for travel to present at a meeting, or for regular conference attendance. **Pay attention to the application deadlines.** Information can be found on the John Jay Student Travel website page.

### Student Complaints:

The CUNY bylaws stress the importance of encouraging critical thinking and giving freedom from discrimination. Students have a right to complain. Please refer to current John Jay College Graduate Bulletin for “Policies, Rules and Regulations” section for college guidelines on the institutional complaint process and how student complaints will be addressed. In addition, the Program Director of the MSFOS Program is required to address any complaints, and maintain an internal record of student complaints. The program director will make sure all complaints are handled professionally and document their resolutions.

# MS FOS Program of Study

## Forensic Science Graduate Course List:

Program requirements consist of 41-43 credit hours. [Prerequisites are in brackets]

### Required Courses:

| FOS Course No. | Title of Course                              | Total Credits     |
|----------------|--|-------------------|
| 706            | Physical and Biological Evidence             | 3                 |
| 707            | Principles of Forensic Toxicology            | 3                 |
| 710<br>*       | Advanced Criminalistics I [Prereqs: 706,722] | 5                 |
| 721<br>*       | Instrumental Analysis I                      | 5                 |
| 722<br>*       | Instrumental Analysis II [Prereqs: 721]      | 5                 |
| 795, 796, 797  | Thesis Prospectus                            | 3 (1 credit each) |

**Specializations and their required courses** (each student is required to select one of the following specializations):

### Criminalistics

| FOS Course No. | Title of Course  | Total Credits |
|----------------|--|---------------|
| 711<br>*       | Advanced Criminalistics II [Prereqs: 710]  | 5             |
| 717            | Organic Compound Structure Determination (Identification of Organic Molecules) <b>OR</b> | 3             |
| 735            | Advanced Topics in Physical Science [710,711,721,722] <b>OR</b>                          | 3             |
| 736            | Forensic Examination of Firearms and Toolmarks [706] <b>AND</b>                          | 3             |
| 730            | Forensic DNA Technology  | 3             |

### Molecular Biology

| FOS Course No. | Title of Course                              | Total Credits |
|----------------|--|---------------|
| 704            | Advanced Genetics                            | 3             |
| 732*           | Advanced Molecular Biology I [Prereqs: 704]  | 5             |
| 733*           | Advanced Molecular Biology II [Prereqs: 732] | 5             |

### **Forensic Toxicology**

| FOS Course No. | Title of Course                           | Total Credits |
|----------------|---|---------------|
| 725*           | Forensic Toxicology I [Prereqs: 707]      | 5             |
| 726*           | Forensic Toxicology II [Prereqs: 707,725] | 5             |
| 730            | Forensic DNA Technology                   | 3             |

### **Elective Courses:**

| FOS Course No. | Title of Course   | Total Credits |
|----------------|---|---------------|
| 705            | Statistics for Forensic Scientists                              | 3             |
| 735            | Advanced Topics in Physical Science<br>[710.711,721,722]        | 3             |
| 736            | Forensic Examination of Firearms and Toolmarks<br>[706]         | 3             |
| 737            | Forensic Electron Microscopy                                    | 3             |
| 760            | Scientific Evidence, Expert Testimony and Ethics                | 3             |
| 761            | Forensic Anthropology: Osteological & Genetic<br>Identification | 3             |
| 762            | Current Trends in Forensic Pathology and<br>Entomology          | 3             |
| 727            | Case Analysis in Forensic Toxicology [707]*                     | 3             |
| 738            | Crime Scene Investigation for Forensic Scientists<br>[706]*     | 3             |
| CRJ708         | Law, Evidence and Ethics (CRJ Elective course)                  | 3             |

\* Indicates a lecture/laboratory course

**Course Sequence for Students.** Please note, that most of the graduate classes are offered either **only in the Fall or only in the Spring** and for some of them enrollment is conditional on having passed another graduate course (see pre-requisites in brackets above). See below for the course sequence that should be followed in order to complete the degree in four semesters. While there is some flexibility regarding the lecture classes and electives may be taken earlier than indicated, the lecture/laboratory course sequence is critical.

Advance planning for the thesis project is also important for achieving this two-year timeline. Students can apply for graduation and participate in the annual Spring commencement ceremony, if they are finishing their coursework that semester and will be able to submit their thesis prior to the summer semester deadline.

Part-time students and students with missing undergraduate coursework having been conditionally admitted to the program will need to plan for at least one additional semester.

All students should make sure to meet with the program director for MS-FOS advisement.

# Course Descriptions

## **FOS 704 Advanced Genetics**

This course provides an in-depth treatment of selected topics in the field of modern genetics. Topics are drawn from classical, molecular, and population genetics and include the nature of genetic variation and mutations, genetic disorders, recombination and repair mechanisms. Ethical issues and the relevance of genetics to clinical medicine (recombinant DNA therapy, cloning) and forensic science (polymorphisms, population genetics) will be explored. Quantitative analysis and problem-solving skills are emphasized.

**Prerequisite(s):** Coursework necessary for admission to Master of Science in Forensic Science Program.

## **FOS 705 Mathematical Statistics for Forensic Scientists**

This course is a calculus-based course intended to provide a solid understanding of probability and mainstream statistical techniques for research and professional applications in the field.

**Prerequisite or Co-requisite:** One year of undergraduate calculus.

## **FOS 706 Physical and Biological Evidence**

This course provides an introduction to the problems encountered and the techniques used in the scientific examination of physical and biological evidence. Topics include crime scene procedures, physical evidence documentation, application of the scientific method in crime scene investigation, scientific and legal integrity of physical evidence, ethical issues, professional standards, expert testimony and the theoretical bases of methods of comparison and their influence on the interpretation of scientific data. Emphasis is placed on practical problem solving in forensic science. Students should register for this course during their first year of study.

**Prerequisite(s):** Coursework necessary for admission to Master of Science in Forensic Science Program.

## **FOS 707 Principles of Forensic Toxicology**

This course serves as an introduction to the basic principles of forensic toxicology. This course emphasizes the common drugs/poisons that are encountered by a practicing forensic toxicologist and the approach to determining their medico-legal role in establishing the cause of death and

disease. Topics include the pharmacology and pharmacokinetics of drugs, impairment versus intoxication, and the interpretation of drug effect in the criminal court setting. The science of ethanol and drugs of abuse, along with other important agents (sports doping drugs, therapeutic drugs, CO etc.), will be discussed as they relate to toxicology. An introduction to the basic applied methods of forensic toxicology is also presented including biological samples, analytical schemes, and some of the special problems commonly encountered in forensic toxicology. Lectures, directed readings, and participatory discussions will introduce the science of forensic toxicology.

**Prerequisite(s):** Coursework necessary for admission to Master of Science in Forensic Science Program.

### **FOS 710 Advanced Criminalistics I**

Fundamental principles used in the analysis and evaluation of physical evidence using micro techniques are stressed in the course. The course emphasizes microscopy and microchemistry of trace evidence such as controlled substances, glass, and fibers. Documentation and photography skills are developed. Students will begin to develop their ability to critically assess forensic situations. Case studies are also used in lectures to integrate theoretical concepts with practical applications.

**Prerequisite(s):** FOS 706 - Physical and Biological Evidence and FOS 722 - Advanced Instrumental Analysis II.

### **FOS 711 Advanced Criminalistics II**

This course teaches concepts and techniques employed in the analysis of physiological fluids using non-instrumental methods. Micro techniques and microscopy are employed for soil analysis, wood identification, and hair examination. Additional documentation and photography skills are developed. Case studies are used in lectures to integrate theoretical concepts with practical applications. The lab course culminates with the analysis and interpretation of trace evidence from a case simulation.

**Prerequisite(s):** FOS 710 - Advanced Criminalistics I.

### **FOS 717 Organic Compound Structure Determination**

This is an advanced course in the use of modern instrumentation, both spectroscopic and chromatographic techniques, for the solution of chemical problems. This course discusses relationships between functionality and the observed spectroscopic properties of organic

molecules. These relationships are then rationalized and used to logically deduce structures of unknown compounds. Chromatographic techniques and principles will be emphasized. Subsequently, five different spectroscopic methods, Nuclear Magnetic Resonance, Mass Spectrometry, Infrared, Ultraviolet Spectroscopy, and Chiro-optical Spectroscopy will be applied in the structural assignment of unknown compounds. The principles behind these methods will be discussed. There will be considerable emphasis on problem solving to determine molecular structure utilizing all available spectroscopic data. Some lecture classes will be practical demonstration of the concepts presented.

**Prerequisite(s):** Coursework necessary for admission to Master of Science in Forensic Science Program.

### **FOS 721 Advanced Instrumental Analysis I**

The purpose of this course is to introduce the student to the use of chemical instrumentation and spectrophotometric techniques for the analyses of physical evidence materials of forensic import. The course includes lectures and problem sessions and has as a critical portion, hands-on laboratory sessions. The successful student will understand the fundamental use and operation of certain types of chemical instrumentation and their application to forensic analytical problems. He/she will also be able to choose the proper technique to successfully analyze a material, and increase his/her knowledge and understanding of the analytical approach and interpretation of quantitative data by proper calibration techniques.

The lectures include the descriptions of various instruments including their designs, the theory of operation, and the fundamental science on which they are based. Applications of these instruments to forensic samples will be discussed. The accuracy and precision of measurements as well as error analysis will be introduced. This course is concentrated on electronic and vibrational spectra, although other instrumentation topics will be covered.

**Prerequisite(s):** Coursework necessary for admission to Master of Science in Forensic Science Program.

### **FOS 722 Advanced Instrumental Analysis II**

The purpose of this course is to introduce the student to the use of instrumental chemical separation techniques for the analyses of physical evidence materials of forensic import. The course includes lectures and problem sessions and has as a critical portion of hands-on laboratory sessions. The successful student will understand the fundamental use and operation of certain types of chemical instrumentation and their application to forensic analytical problems. He/she

will also be able to choose the proper technique to successfully analyze a material, and increase his/her knowledge and understanding of the analytical approach and interpretation of quantitative data.

The lectures include the descriptions of various instruments including their designs, the theory of operation, and the fundamental science on which they are based. Applications of these instruments to forensic samples will be discussed. This course is concentrated on chromatography and other separation techniques although other instrumentation topics will be covered.

**Prerequisite(s):** FOS 721 - Advanced Instrumental Analysis I.

### **FOS 725 Forensic Toxicology I**

This course introduces students to methods of determining the presence or absence of drugs (and metabolites) and chemicals in human fluids and tissues and evaluating their role as a contributory factor in the cause or manner of death and disease. This course deals with the systematic approach to processing biological samples for the presence of drugs and poisons. Students are introduced to the fundamental theoretical principles applied to forensic toxicology with topics including: postmortem and ante mortem toxicology, sample preparation and extraction techniques, and methods of analytical screening and confirmation (chromatography, GCMS, LCMS, immunoassay), that are used to solve problems confronting the forensic toxicologist. Advanced topics associated with pharmacokinetics and pharmacodynamics are discussed as they relate to the interpretation of toxicological results. The general focus of the course will be to examine the scientific aspects of the detection of intoxications and the role of intoxicating agents in the commission of crimes and/or overdose and poisoning. The laboratory sessions introduce the basic analytical principles that are common in forensic toxicology. This includes the various methods of sample preparation, extraction, and drug screening, determination of blood ethanol levels and qualitative and quantitative analysis of specimens for various drugs of abuse. Common acidic, basic, and neutral drug screening methods will be applied along with the concepts of conformational analysis.

**Prerequisite(s):** FOS 707 - Principles of Forensic Toxicology

### **FOS 726 Forensic Toxicology II**

This course is a continuation of the advanced study of the scientific principles associated with the medico-legal aspects of drugs and poisons. It builds upon the specific forensic material, general pharmacology, and toxicology presented in previous courses. Forensic toxicology is an evolving science dealing with the qualitative and quantitative identification of poisonous substances and the



consequent application of the results to an episode of intoxication. Forensic Toxicology II is intended to formulate a basis through which the student becomes more conversant with a wide range of practical components designed to reinforce topics covered earlier and seeks to give students experience in analytical problems specific to the human biological condition. This course covers the applied aspects commonly encountered in the practice of forensic toxicology: human performance testing, workplace/occupational drug testing, sports medicine, clinical toxicology, the role of the toxicologist in the courtroom and expert testimony, QA/QC and toxicology laboratory management issues. Specific problems will be expanded to include consideration of the impact resulting from a variety of synthetic and/or natural toxins. In this framework, aspects of terrorist attacks with potential weapons of mass destruction will also be discussed. Parallel laboratory sessions dealing with the above topics will be included in order to demonstrate some of the practical aspects associated with these issues. Methods of workplace drug testing, detection of doping agents, therapeutic drug monitoring, and QA/QC topics will be addressed in the laboratory environment.

**Prerequisite(s):** FOS 707 - Principles of Forensic Toxicology and FOS 725 - Forensic Toxicology I.

### **FOS 730 Forensic DNA Technology**

Many advances in molecular biology that impact on the medico-legal fields have taken place in recent years. Analytical procedures used to study DNA have been developed for genetic research, clinical studies, and human/non-human identification. Molecular Biology for Forensic Scientists is a survey course geared to forensic science students in the criminalistics and forensic toxicology specializations. Lecture topics include: an overview of forensic biology, statistics and population genetics including: sample collection; bioethics; DNA extraction, quantitation, and typing; databases; lab validation, including quality assurance and quality control, and emerging technologies.

**Prerequisite(s):** Coursework necessary for admission to Master of Science in Forensic Science Program.

### **FOS 732 Advanced Molecular Biology I**

Many advances in molecular biology that impact on the medico-legal fields have taken place in recent years. Analytical procedures used to study DNA have been developed for genetic research, clinical studies, and human/non-human identification. Molecular Biology for Forensic Scientists is a survey course geared to forensic science students in the criminalistics and forensic toxicology specializations. Lecture topics include: an overview of forensic biology, statistics and population

genetics including: sample collection; bioethics; DNA extraction, quantitation, and typing; databases; lab validation, including quality assurance and quality control, and emerging technologies.

**Prerequisite(s):** FOS 704 - Advanced Genetics.

### **FOS 733 Advanced Molecular Biology II**

This course provides an in-depth treatment of selected topics in molecular biology. Lecture topics include the structure and function of nucleic acids and proteins; DNA replication, recombination, and repair; mutagenesis; transcription and translation; regulation of gene expression; mobile genetic elements, and molecular biological techniques.

The laboratory introduces experimental methodologies: cell culture techniques, transformation, DNA and protein isolation, electrophoresis, Southern and Western blotting, DNA sequencing, and recombinant DNA techniques. QA/QC topics will be addressed in the laboratory environment.

**Prerequisite(s):** FOS 732 - Advanced Molecular Biology I.

### **FOS 735 Advanced Topics in Physical Science**

This course will introduce the student to the use of advanced instrumental techniques for the analyses of physical evidence materials of forensic import. The course includes lectures and problem sessions. At the conclusion of the course the successful student will understand the use and operation of certain types of advanced chemical instrumentation and their application to certain forensic samples. The student will also be able to choose the proper techniques to successfully analyze these materials. Qualitative methods will be covered and quantitative analysis will be stressed.

Evidence types to be covered are glass, paints, fibers, metals, gunshot residues, and inorganic materials. Careful calibration, which is necessary for quality analysis, will be stressed. Ethical concerns over interpretation and report generation will be covered.

**Prerequisite(s):** FOS 710, 711, 721 and 722

### **FOS 736 Forensic Examination of Firearms and Toolmarks**

After a brief review of the development of firearms and ammunition, a detailed examination of the manufacturer of firearms and ammunition will follow. These principles will be developed to

provide a robust background for the student to understand the concepts and theoretical basis of comparison microscopy as it is used to associate fired ammunition to the firearm from which it was discharged. The same principles will also be applied to the forensic analysis of toolmarks. Grading will be based on the written and oral assignments, the examinations and class participation.

**Prerequisite(s): FOS 706**

### **FOS 737 Forensic Electron Microscopy**

This is a lecture, demonstration and laboratory class that will introduce the student to the theory and applications of electron microscopy as well as that of x-ray spectrometry to forensic and chemical analysis. Diffraction theory in electron microscopes will also be introduced. The class will concentrate on Scanning Electron Microscopy (SEM), with less emphasis on Transmission Electron (TEM) and Analytical Electron Microscopy (AEM) techniques.

**Prerequisite(s): FOS 721 and FOS 722**

**Co-Requisite(s): FOS 710**

### **FOS 760 Scientific Evidence, Expert Testimony and Ethics for Research and Forensic Scientists**

This is a course of study designed to introduce the forensic science student to the inter-relationship of science and the law as well as discuss some of the ethical problems that may confront him/her in their role as an expert witness and scientific researcher. The role of the expert and his testimony in assisting the court and the trier of fact will be explored. Classic Frye rule considerations will be presented, as well as the newer Daubert guidelines. The impact of the Federal Rules of Evidence will be discussed.

The course will be taught by lectures and by the Socratic Method. Students will be given assignments from textbooks, handouts, and library research and are expected to be prepared for class discussions each period. A portion of the instruction will be on how to prepare and testify as an effective expert. Some time will be spent on dealing with cross-examination.

**Prerequisite(s):** Coursework necessary for admission to Master of Science in Forensic Science Program.

### **FOS 761 Forensic Anthropology: Osteological & Genetic Identification**

This course will introduce students to methods in forensics, with applications ranging from the study of ancient civilizations to modern criminal cases. As part of the course, students will become familiar with crime scene investigation techniques and excavations of human remains in archaeological contexts. Students will be introduced to sample collection and identification methods for human and nonhuman remains, including DNA analyses, osteology, and facial reconstruction. The students will also develop skills in basic human skeletal anatomy, pathology and trauma investigation, sample/evidence collection, genotyping, and the study of changes occurring in bodies post-mortem, or taphonomy. Finally, the broader social and legal context of forensic analyses in different communities will be presented in the course by discussing well-known archaeological and criminal investigation cases.

**Prerequisite(s):** None

### **FOS 762 Current Trends in Forensic Pathology and Entomology**

This course will provide students with an in-depth introduction into the historical and current methodologies and practices in the fields of forensic pathology and entomology. Students will be involved in critiquing and evaluating historical and current research in the field. Students will also develop their practical skills through a field exercise where they will learn about chain of custody and will incorporate collection, sampling and analytical techniques relevant to the field of forensic science, pathology and entomology. They will also learn the basic skills of histology in forensic pathology.

**Prerequisite(s):** Coursework necessary for the admission to the Master of Science in Forensic Science program

### **FOS 795 Thesis Prospectus I**

The first in a series of three mandatory prospectus courses is a seminar designed to introduce the student to John Jay college resources, current topics in forensic science, and scientific research design. In preparation for finding a mentor and starting thesis research, students will hear about scholarly research by science faculty, research ethics, and library and writing center resources. The class also covers professional ethics and ethical issues in forensic science. Students will develop critical analysis and scientific writing skills. Students should register for FOS 795 in their first semester of study.

**Prerequisite(s) for 795:** Coursework necessary for admission to Master of Science in Forensic Science Program.

### **FOS 796 Thesis Prospectus II**

The second required prospectus seminar course continues to introduce the student to scholarly research, and professional and ethical issues in scientific research and forensic science. In this formal seminar, presentations by a combination of invited experts, faculty, and/or students on published articles, original research, and other relevant topics will provide students with a broader perspective on forensic science. Students will develop critical literature review and oral and written communication skills. In FOS 796 students present the development of their thesis research, from literature review and experimental design to preliminary data. Students must develop and submit a thesis prospectus by the end of this course.

**Prerequisite(s) for 796:** FOS 795

### **FOS 797 Thesis Prospectus III**

The third required prospectus class requires the student to work on a research project under the tutelage of a faculty member. Before registering for this class using the Graduate Thesis Prospectus form the student must have identified a faculty mentor, a thesis project, and if applicable obtained Human Subject Research approval. The purpose of this course is to assist the student to complete their thesis research requirement. Students will hone their research, data analysis, and scientific reasoning skills.

**Prerequisite(s) for 797:** FOS 796

### **CRJ 708 Law, Evidence and Ethics**

Examines the rules of evidence followed in criminal investigations, criminal trials and administrative proceedings. Pays special attention to the methods and ethical obligations of government agents assigned to gather evidence.

**Prerequisite(s):** None (This course is offered by the Criminal Justice Program.)

### **FOS 727 Case Analyses in Forensic Toxicology**

This course educates students in forensic toxicology interpretation and expert testimony in court in criminal and civil cases. Cases that will be investigated and discussed include the critical review of analytical data (what causes a false positive drug test result?), the accuracy of alcohol testing and the issues related to alcohol back-calculations, how doses and route of administration

influence the drug's effects, and interpretation of hair analysis, among others. The course will follow a Problem-Based Learning (PBL) strategy. PBL is a student-centered learning approach based on the student's autonomy on their goal-setting, collaboration, communication and critical thinking within real-world practices.

**Prerequisite(s):** FOS 707

### **FOS 738 Crime Scene Investigation for Forensic Scientists**

This course explores the techniques and procedures used by crime scene investigators in gathering probative forensic evidence. Often criminalists within lab settings receive evidence for analysis which does not provide context for how and where it was collected, nor the context under which it has been forwarded to the lab. The determination of contributing probative events which lead to a crime scene must be approached in a logical and discriminatory manner to provide investigators, prosecutors, and jurors with a fair and accurate understanding of how a crime unfolded. The class will teach hypothesis driven approaches, critical thinking and context evaluation to guide the use of physical evidence and crime scene reconstruction as an investigative tool. Limitations and ethical concerns regarding crime scene processing will be discussed. Lecture concepts will be reinforced through practical exercises.

**Prerequisite(s):** FOS 706

# Student Support

## Academic Counseling

Graduate advisors and the Program Director are available for consultation on academic matters throughout the year. Students must meet with their advisors prior to registration each semester or when other academic questions arise.

## Personal Counseling

Licensed professionals offer a range of psychological and counseling support services to meet the adjustment, mental health and developmental needs of students and others in the campus community. To help foster academic, personal and vocational development in students, a wide range of counseling, outreach, training, consultation and educational services are offered by staff and graduate externs. The office (212.237.8111) also supports the academic goals of the College through consultation with faculty, staff and campus organizations. A vital component of counseling services is provided by the Women's Center (212.237.8184) as well.

## **Services Offered:**

All of our services are currently offered remotely. This means we conduct counseling sessions via telephone or video (Zoom). Students may request our services via email or phone (see below).

Here are a few services we offer to John Jay students:

- Intake Evaluations
- Crisis/Consultation Counseling
- Individual Counseling
- Group Counseling
- Referral Consultations
- Substance Use Evaluations
- Substance Use Counseling
- Confidential Title IX Evaluations

## Career Advisement

The Center for Career & Professional Development (212.237.8754 and located at L72.00 NB) offers a range of services to support and foster the development of graduate students. The office fosters training, consultation and other services to those students who are seeking professional experience in their various fields of study before completion of their degrees. Career advisers are

available to meet with graduate students on an individual basis for career consultations. The Center for Career & Professional Development even offers evening appointments and the option to request a phone or SKYPE appointment. To set up an advising appointment please visit: <https://jjay-cuny-csm.symplicity.com/students/> to log in or create your John Jay Careers account.

## **Housing**

Currently, there are no housing facilities available to graduate students at John Jay College of Criminal Justice-CUNY. Students who are accepted to the Graduate Program in Forensic Science are advised to allow ample time to find housing. Students requiring assistance in finding housing should contact the Office of Student Activities. Material regarding contact information and the description of services offered by the Office of Student Activities can be found on John Jay College's website

## **Financial Aid and Fellowships**

Financial aid is available to matriculated students in the form of grants, loans and part-time student employment opportunities (Federal Work Study). Interested students are encouraged to contact John Jay College's Financial Aid Office for additional information and scheduling appointments to speak with a financial aid advisor. The college offers a variety of scholarship opportunities that recognize and support research, academic excellence, leadership qualities and public service accomplishments. These can be researched here: <https://www.jjay.cuny.edu/graduate-scholarships>