

Fall 2020

## FRSC 479-001: Forensic Biology

David Fisher

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**FRSC 479: Forensic Biology**  
**Fall 2020**  
**M: 12:30-4:50P TIER 209**  
**W: 6:00-7:55P online**  
*Course Syllabus*

**COURSE INFORMATION**

**Course Description:** This course will cover the scientific principles behind forensic DNA analysis techniques: DNA extraction, quantification, amplification, interpretation of STR data, and the statistical analysis of DNA profiles. Students will also learn about current developments in the field, interesting historical cases involving forensic DNA, and legal challenges to new DNA technologies. The course also contains a weekly laboratory component.

**Number of Credits:** 4

**Prerequisites:** BIOL 352, CHEM 473, and BIOL 201

Course-Section	Instructor
FRSC 479-001	David Fisher
Lab M: 12:30-4:50P, TIER 209	Office: Tiernan Hall 385 or <a href="https://njit.webex.com/meet/dfisher">https://njit.webex.com/meet/dfisher</a>
Lecture W: 6-7:55P, online	Office Hours: M @ 5pm & by appt.
	Ph: 973-596-5295; email: <a href="mailto:dfisher@njit.edu">dfisher@njit.edu</a>

**Required Textbook:**

<b>Title</b>	(1) <i>Fundamentals of Forensic DNA Typing</i>
<b>Author</b>	John Butler
<b>Edition</b>	
<b>Publisher</b>	Academic Press
<b>ISBN #</b>	978-0123749994

**Recommended Textbooks (If you plan on pursuing a career in Forensic Biology, you should get these):**

<b>Title</b>	(2) <i>Advanced Topics in Forensic DNA Typing: Methodology</i>
	(3) <i>Advanced Topics in Forensic DNA Typing: Interpretation</i>
<b>Author</b>	John Butler
<b>Publisher</b>	Academic Press
<b>ISBN #</b>	978-0123745132 & 973-0124052130

and additional readings as assigned. You must also have a computer with a reliable internet connection, webcam, and a microphone.

**University-wide Withdrawal Date:** The last day to withdraw with a W is Monday, November 9, 2020. It will be strictly enforced.

**Learning Outcomes:** Upon completion of this course, students will:

- Identify forensic science procedures and technologies used to examine and analyze DNA evidence
- Evaluate the statistical significance of DNA results
- Communicate appropriate conclusions based on DNA results
- Apply critical thinking skills using methods of scientific inquiry through discussing recent high profile cases
- Understand how forensic biological data influences legal decisions and shapes scientific reporting requirements
- Be able to understand and explain probabilistic genotyping
- Learn about new DNA technologies, including Rapid DNA, Forensic Genealogy, and Massively Parallel Sequencing

## **POLICIES**

**All CES students must familiarize themselves with, and adhere to, all official university-wide student policies. CES takes these policies very seriously and enforces them strictly.**

**[NJIT Academic Integrity Code](http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf):** Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at [dos@njit.edu](mailto:dos@njit.edu).

**Grading Policy:** The final grade in this course will be determined as follows:

<b>Class Participation</b>	10%
<b>Labs</b>	50%
<b>Midterm</b>	20%
<b>Final Exam</b>	20%

Your final letter grade in this course will be based on the following:

<b>A</b>	90-100	<b>C</b>	70-76
<b>B+</b>	87-89	<b>D</b>	60-69
<b>B</b>	80-86	<b>F</b>	<60
<b>C+</b>	77-79		

**Attendance Policy:** This course will be delivered in a “[converged learning](#)” format. Class attendance (either in-person or online) will be recorded and is **mandatory**. Each class is a learning experience that cannot be replicated through simply “getting the notes.” After one unexcused absence, each

subsequent absence will result in your class participation score being lowered by one percentage point. (All excused absences need to go through the Dean of Students). You are expected to read the relevant chapters and/or reading assignments prior to the lecture and lab. Students who participate in class will receive points towards their class participation grade. Labs (on Mondays) will be in-person in Tiernan 209. We will be wearing PPE and practicing social distancing. Lectures (on Wednesdays) will be online in my WebEx room (<https://njit.webex.com/meet/dfisher>).

**Midterm:** Exam will be taken on-line through Canvas. Midterm will cover the readings and lectures. You will need to download Lockdown Browser and Respondus Monitor as the exam will be given through these platforms. You will also need a computer, webcam, and good internet connection when taking the exam.

Midterm	Nov 4, 2020
Final Exam	Final Exam Week

**Makeup Exam Policy:** There will normally be **NO MAKE-UP EXAMS** during the semester. In the event that a student has a legitimate reason for missing an exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor’s note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the CES Department Office/Instructor that the exam will be missed. A written assignment will be given in place of any missed exam.

## ADDITIONAL RESOURCES

**Accommodation of Disabilities:** Office of Accessibility Resources and Services (*formerly known as Disability Support Services*) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please contact Chantonette Lyles, Associate Director at the Office of Accessibility Resources and Services at **973-596-5417** or via email at [lyles@njit.edu](mailto:lyles@njit.edu). The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Office of Accessibility Resources Services office authorizing your accommodations will be required.

For further information regarding self-identification, the submission of medical documentation and additional support services provided please visit the Accessibility Resources and Services (OARS) website at:

- <https://www.njit.edu/studentssuccess/accessibility>

**Important Dates** (See: [2020 Academic Calendar](#))

Date	Event
Sep 1	First Day of Classes
Sep 7	Labor Day - no class
Sep 8	Monday classes meet / Last day to add or drop
Nov 25	Friday classes meet
Nov 26-29	Thanksgiving Recess
Dec 10	Last Day of Classes
Dec 11-12	Reading Days
Dec 15-21	Final Exams

# Course Outline

Lecture	Date	Topic	Assignment
Week 1	W, Sep 2	Introduction; Overview & DNA Basics	1:1-3
	Sep 8 (Tues)	Monday Classes meet: Safety; Pipetting; Decontamination	Handout
Week 2	W, Sep 9	History of DNA Typing	
	M, Sep 14	<a href="#">Int'l Symposium on Human ID (ISHI) virtual conference</a>	<b>Write a 2 pg summary on Rapid DNA</b>
Week 3	W, Sep 16	Serology; Body Fluid Identification	Handouts
	M, Sep 21	Body Fluid ID lab	<b>Lab Report 1</b>
Week 4	W, Sep 23	Sample Collection and Extraction	1:4-5 (2:1-2)
	M, Sep 28	Yom Kippur (class will not meet)	
Week 5	W, Sep 30	DNA lab Virtual Field Trip	
	M, Oct 5	Extraction Lab – Automate Express	<b>Lab Report 2</b>
Week 6	W, Oct 7	Quantification	1:6 (2:3)
	M, Oct 12	Quantification Lab -- QuantStudio	<b>Lab Report 3</b>
Week 7	W, Oct 14	Amplification & PCR; STR markers	1:7-8 (2:4-5)
	M, Oct 19	Amplification Lab – ProFlex	<b>Lab Report 4</b>
Week 8	W, Oct 21	Capillary Electrophoresis	1:9 (2:6; 3:8)
	M, Oct 26	Bode Virtual Forensic DNA Conference	<a href="#">Attend Bode Virtual DNA Conference</a>
Week 9	W, Oct 28	Data Interpretation	1:10 (3:1-8)
	M, Nov 2	Capillary Electrophoresis -- SeqStudio	<b>Lab Report 5</b>
Week 10	W, Nov 4	DNA databases; CODIS; <b>MIDTERM EXAM (online)</b>	1:12 (2:8)
	M, Nov 9	Genemapper IDX lab I	
Week 11	W, Nov 11	Mixtures	1:14 (3:6)
	M, Nov 16	Genemapper IDX lab II	<b>Lab Report 6</b>
Week 12	W, Nov 18	Statistics	1:Appendix3&11 (3:9&11)
	M, Nov 23	STRmix I; Probabilistic Genotyping	
Week 13	W, Nov 25	No class—Friday classes meet	
	M, Nov 30	STRmix II	<b>Lab Report 7</b>
Week 14	W, Dec 2	Y-STRs and mtDNA	1:16 (2:13-14)
	M, Dec 7	Finish up any remaining labs; lab checkout	
Week 15	W, Dec 9	Last Day of class; New Technologies; review for Final	1:18 (2:17)
	Finals Week	<b>Final Exam</b>	

*Updated by David Fisher - Aug 28, 2020  
Department of Chemistry & Environmental Sciences  
Course Syllabus, Fall 2020*