Fall 2023

FRSC 495-001:Senior Seminar: Drone Forensics

David Fisher

NJIT New Jersey Institute of Technology

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE

FRSC 495: Senior Seminar
Drone Forensics
T/R 2:30-3:50am; FMH Room 309
Course Syllabus

COURSE INFORMATION

Course Description: This course explores the rapidly expanding use of Unmanned Aerial Systems (UAS) or Unmanned Aerial Vehicles (UAV) also known as drones to assist forensic investigations. These UAVs allow the user to document events using both video and photographs from a vantage point not easily obtained. The data collected can then be further extracted to form maps and models of the scene. Digital footprints can also be extracted from the drone itself and/or remote controller using digital forensics software to determine the identity of the suspect. Students in this course will first be taught the knowledge and skills necessary to apply for a FAA Part 107 Commercial Drone (UAS) license. Next, they will develop their piloting skills to capture data through a series of lectures and practical problems typically found by forensic investigators. A survey of legal requirements for drone use and procedures to follow to seek authorizations to fly in certain areas will also be covered. Finally, students will research a novel area of drones that can be used in forensic science.
Number of Credits: 3 **Prerequisites**: none

ACADEMIC INTEGRITY

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 my professional obligation and responsibility is 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"*

Course-Section and Instructor

Course-Section	Instructor
FRSC 495	Prof. David Fisher
T/R 2:30-3:50am	Office: Tiernan Hall 323A or https://njit.webex.com/meet/dfisher
	Office Hours: Tuesdays 11:30 am – 12:30 pm & by appt.
	Ph: 973-596-5295; email: dfisher@njit.edu

Required Reading: Articles and videos 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, Nov 13, 2023. It will be strictly enforced.

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

- learn the necessary training to be able to pass the FAA part 107 licensing exam
- learn to properly assess a situation so that safe operations of a UAV may be conducted along with seeking proper legal authorizations and exemptions from appropriate entities
- learn the effective and safe operation of a UAV both inside and outside various structures using practical problems
- learn methods to properly image forensic crime scenes using a UAV. This will include the use of mapping and modeling software to create effective and demonstrative evidence
- explore other uses of a UAV for law enforcement, public safety, military, and intelligence operations.
- conduct original research on a novel use of drone forensics.

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.

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

Attendance/Class Participation	10%
Assignments	10%
Pass FAA part 107 Exam	35%
Research Project Paper	30%
Research Project Presentation	15%

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

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

Attendance Policy: Class attendance 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 reading assignments prior to the lecture. Two late arrivals (of more than 10 minutes) will count as one absence.

Research Project (30% & 15%):

Each student will conduct an individual research project in consultation with the professor.

(1) The student will identify a topic and source material early in the semester
(2) The student will write a 1 page proposal and annotated bibliography. (Due the third week of the semester)
(3) The student will develop and present the research project in a short PowerPoint Presentation to the class and receive feedback from their peers as well as the professor.
(4) The student will write a final paper based on the research done and feedback received across the course

The instructions for each component of the research project will be available on the Canvas course webpage. The research paper is designed to evaluate your writing skills and your understanding of your drone forensic research topic. The research paper should be approx. 10 pages in length (not including the title page or

bibliography), double spaced, using Times New Roman 12-point font. You must get approval from me for your topic by week 3. All papers will be run through Turnitin.com to check for plagiarism and chatGPT. (Turnitin.com is a software program that analyzes papers for plagiarism and AI).

For this paper, you are expected to be able to locate and use library resources effectively and cite them correctly using in-text citations and a works cited page. Googling alone will not suffice. Most of the library materials are available online 24/7 from anywhere. Quinn Morris-Pearson is the NJIT librarian who provides assistance to students in Forensic Science. Contact her at quinn.i.morris-pearson@njit.edu and take advantage of her expertise.

Exams: The only exam in this course will be taking and passing the Federal Aviation Administration's (FAA) Part 107 Exam. The Exam will be taken offsite at an FAA testing center. There is an additional charge for this 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 the Office of Accessibility Resources and Services at 973-596-5417 or via email at oars@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/studentsuccess/accessibility

Important Dates (See: 2023 Academic Calendar)

Date	Event
Sept 5	First Day of Classes
Sept 11	Last day to add/drop a class
Nov 21	Thursday classes meet
Nov 23-26	Thanksgiving Recess
Dec 13	Last day of classes
Dec 14-15	Reading Days
Dec 17-23	Final Exams

Course Outline

Week	Date	Topic	
1	Sept 5 & 7	Introduction and Welcome	
2	Sept 12 & 14	sUAS Regulations; National Airspace System	
3	Sept 19 & 21	Flight Restrictions; Aeronautical Charts	**1 Page Research proposal due**
4	Sept 26 & 28	Airport operations; Radio Communications	
5	Oct 3 & 5	Aviation Weather; Maintenance & Preflight Procedures	
6	Oct 10 & 12	Crew Resource Management & Decision Making	
7	Oct 17 & 19	Loading and Performance; Hazards & Emergency Procedures	
8	Oct 24 & 26	Aviation Physiology; Night Operations	
9	Oct 31	**Review for part 107 Exam**	
	Nov 2	NJIAI Meeting (Atlantic City, NJ) class will not meet	**FAA Part 107 Exam**
10	Nov 7-10	NEAFS Meeting (Mystic, CT) class will not meet	**Research Literature Review Due**
11	Nov 14 & 16	EAS Symposium (Princeton, NJ) class will not meet	
12	Nov 21	(Thurs classes meet); Flight experience; CSI using drones	**Draft of Research Paper Due**
	Nov 23	Thanksgiving (No class – University Closed)	
13	Nov 28 & 30	Flight experience; CSI using drones	
14	Dec 5 & 7	Final Research Project Presentations	**Research Presentations**
15	Dec 12	Last Day of class	**Research Papers Due**