University of Illinois Fire Service Institute

Course Syllabus

Course Title: Small Unmanned Aircraft Systems (sUAS) for Public Safety – NFPA 2400 Operations

Course Duration: 40 Hours

Program: Special Operations and Training Programs

Course Prerequisites: Registrants must be certificated by the Federal Aviation Administration (FAA) as a Remote Pilot with sUAS rating under 14 CFR Part 107. Registrants must be up-to-date with FAA recurrent knowledge requirements, and if certificated prior to March 2021, must have completed one of the FAA's recurrent knowledge courses (ALC-515 or ALC-677, as applicable).

Course Description: Students successfully completing this course will be eligible for Pro Board certification under NFPA 2400 Chapter 5, Professional Qualifications for sUAS Public Safety Personnel, which identifies the job performance requirements for public safety Remote Pilots and Visual Observers. Students will review Crew Resource Management, the roles of the Visual Observer, the Person Manipulating the Controls, and the Remote Pilot in Command. Students will learn the sUAS team's role and function within the Incident Command System (ICS). Students will learn sUAS flight mission planning and prepare a mission plan for a given public safety scenario in a real-world setting. Students will prepare for and engage in practical flight operations, developing mission-critical neuromotor and communication skills.

NFPA 2400, Standard for Small Unmanned Aircraft Systems (sUAS) Used for Public Safety Operations, 2019 edition details the minimum requirements for the safe operation, deployment, and implementation of sUAS including organization program criteria and considerations, professional qualifications for safety personnel, and elements of a maintenance program. It was created with support from the National Institute for Standards and Technology (NIST) and the American National Standards Institute (ANSI). NFPA 2400 is the primary reference for this course.

Course Requirements:

Pre-Course Work – Completed prior to starting class
Course Work – Attend and participate in class activities. Participate in Performance Evaluations.
Post-Course Work – Complete On-line Course Evaluation Questionnaire

University of Illinois Fire Service Institute

Course Policies:

Attendance Policy: IFSI requires students to attend (100%) or make up all course content that leads to certification. Students are expected to attend on time and to remain in class for the duration of the course. Students MUST COMPLETE all portions of a certification course, both classroom and practical, to be eligible to receive their certification.

If a student misses any portion of class with an accumulated absence of 20% or less of scheduled class time, it will be the student's responsibility to arrange the make-up of the missed course content with the instructor(s) or program manager. The student must make up the specific course content that s/he missed, not just the hours. Make-ups are limited to 20% of scheduled class time. Make-ups must be documented on the class roster. If a student's absence is greater than 20% refer to "True Emergencies" section of the IFSI Examination Policy.

Safety Policy: Students shall understand and follow all instructions pertaining to operational safety, as stated by instructors, or as written in course materials. Instructors and students shall be always mindful of safety. Conduct judged to be unsafe shall be grounds for dismissal from the course.

Academic Integrity Policy: IFSI has the responsibility for maintaining academic integrity to protect the quality of the education provided through its courses, and to protect those who depend upon our integrity. It is the responsibility of the student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions. Any violation of the code of conduct is grounds for immediate dismissal from the course.

Grading Policy: Decisions regarding certificates of course completion shall be made solely by the lead instructor of the course. All grading of exams shall be conducted by the Curriculum/Testing Office. All grading of practical exercises shall be based upon the standards set by the regulatory agency referenced in the course material and IFSI.

> Retesting: If a student fails to pass an exam, retesting takes place on set dates at regional sites across the state. More information is provided in the course completion e-mail and on the IFSI website.

American Disabilities Act: As guaranteed in the Vocational Rehabilitation Act and in the American Disabilities Act, if any student needs special accommodations, they are to notify their instructor and provide documentation as soon as possible so arrangements can be made to provide for the student's needs. If arrangements cannot be made at the class site, the student will test at an alternative time and place where the special accommodations can be made.

Evaluation Strategy: Students will be evaluated through a combination of Performance Evaluation Checklists.

Course Content:

Module: 1
Title: NFPA 2400 Overview
Terminal Learning Objective:
At the conclusion of this module, the student will explain in-depth the components that makeup NFPA 2400 for application to an sUAS Program.

Module: 2
Title: Program Development
Terminal Learning Objective:
At the conclusion of this module, the student will demonstrate a comprehension of public safety sUAS program development concepts.

Module: 3
Title: Program Management
Terminal Learning Objective:
At the conclusion of this module, the student will demonstrate a comprehension of public safety sUAS program management.

Module: 4
Title: Legal Considerations
Terminal Learning Objective:
At the conclusion of this module, the student will analyze past and current case law, as it relates to UAS operations, that effects public safety.

Module: 5
Title: Mission Planning
Terminal Learning Objective:
At the conclusion of this module, given (simulated) mission objectives and goals, resources, environmental conditions, and scenario(s), the student will produce a written mission plan for an sUAS operation.

Module: 6
Title: Flight Fundamentals and Equipment
Terminal Learning Objective:
At the conclusion of this module, the student will communicate and demonstrate the requirements to evaluate the conditions that keep the aircraft in flight.

Module: 7
Title: Communications
Terminal Learning Objective:
At the conclusion of this module, the student will apply procedures for radio communication methods, obtaining airspace authorizations, using flight software applications, and monitoring ADS-B systems.

Module: 8
Title: NIST Testing
Terminal Learning Objective:
At the conclusion of this module, the student will demonstrate coordinated proficiency meeting the standard as a Remote Pilot in Command (RPIC) and as a Visual Observer (VO) to obtain detailed information from the NIST Basic Proficiency Evaluation for Remote Pilots (BPERP) course.

Reference List:

NFPA 2400: Standard for Small Unmanned Aircraft Systems (SUAS) Used for Public Safety Operations, 2019

United States. (2020). *Pilot's handbook of aeronautical knowledge*.

United States. FAA. Aeronautical Information Services. *FAA Aeronautical Chart Users' Guide*, 09/30/2021

Russell, D. (2021, November 15). Aerial Systems. NIST. Retrieved November 22, 2021, from https://www.nist.gov/el/intelligent-systems-division-73500/standard-test-methods-response-robots/aerial-systems.

United States. (n.d.). Unmanned Aerial Systems. FAA. Retrieved November 22, 2021, from https://www.faa.gov/uas/

United States. (n.d.) National Archives Code of Federal Regulations Retrieved November 22, 2021, from https://www.ecfr.gov/current/title-14/chapter-I/subchapter-F/part-107

NOAA (n.d.). National Oceanic Atmospheric Administration. METAR. Retrieved November 22, 2021 from https://www.aviationweather.gov/metar

University of Illinois Fire Service Institute

Course Schedule

DAY ONE

Event	Duration
Module 1	1 Hour
Module 2	1 Hour
Module 3	1 Hour
Module 4	1 Hour
Lunch	
Module 5	1 Hour
Module 6	1 Hour
Module 7	1 Hour
Module 8	1 Hour

DAY TWO

Event	Duration
Drill 1 – Bucket Stands 1.1 BPERP Practice Test Lanes: Position & Traverse (VLOS or BVLOS) 1.2 BPERP Practice Test Lanes: Orbit (VLOS or BVLOS)	4 Hours
Lunch	
Drill 1 – Bucket Stands (cont.) 1.3 BPERP Practice Test Lanes: Spiral (VLOS or BVLOS) 1.4 BPERP Practice Test Lanes: Recon (VLOS or BVLOS)	4 Hours

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DAY THREE

Event	Duration
Drill – Bucket Stands (cont.)	4 Hours
Lunch	
Evaluation – NIST Test Lane	4 Hours

DAY FOUR

University of Illinois Fire Service Institute

Event	Duration
Skills Evaluations	4 Hours
Lunch	
Skill Evaluations	4 Hours

DAY FIVE

Event	Duration
Drill – Wide Area Search	4 Hours
Lunch	
Drill – Wide Area Search Drill (cont.)	2 Hours