# Dakota College at Bottineau


# Small Unmanned Aircraft Systems (sUAS) Policy and Procedures Manual

Adopted 10/05/2023

1. Purpose

    a. Ensure compliance with the Federal Aviation Administration's (FAA), the State of North Dakota, and any local rules and regulations pertaining to sUAS flight.

    b. Conduct safe flight on campus. Safe flight will reduce or eliminate risks to sUAS crew, by-standers, and property when drones are flown on campus.

    c. Promote educational opportunities for students on campus while teaching them safe and appropriate use of sUAS.

1.1 Disclaimer – this policy is intended to be a guideline for students, faculty, and staff operating an sUAS on DCB's campus. This policy will not circumvent, waive, or override any other policy or regulations set forth by federal, state, local, or campus entities. This manual will not address every possible situation encountered. Nor will it oversee outside contractors flying on campus for non-educational purposes.

2. Terms and Definitions

**14 CFR Part 107 –** Title 14 of the Code of Federal Regulations part 107 – this is the government policy regulating matters relating to small unmanned aircraft systems (sUAS) use. Title 14 of the code regulates Aeronautics and Space and part 107 specifically addresses sUAS.

**FAA** – Federal Aviation Administration – the government organization responsible for managing airspace for all types of aircraft.

**sUAS** – Small Unmanned Aircraft System – also referred to as a drone. This is the aircraft, the control station, payload, and any other components involved in the flight of an aircraft where the pilot is not on board the aircraft.

**Mission** – sometimes called an operation – is a complete plan to carry out a flight or set of flights in order to produce a project or set of information (photographs, imaging data, etc.) for a client/work order/assignment.

**Crew** – the personnel directly involved in the mission or flight of an sUAS. Crew members include but are not limited to the remote pilot in command (RPIC), the visual observer, and the person manipulating the controls.

**RPIC** – Remote Pilot in Command – the person directly responsible for all aspects of an unmanned flight mission.

**Visual Observer** – helps alert the RPIC and the rest of the crew about hazards and changing conditions during the operation.

**Person manipulating the controls** – the person who is using the control station for the sUAS during the flight. This may be the RPIC, but it could also be a person without a part 107 license or a person with an expired part 107 license.

**FRIA** – FAA-Recognized Identification Area – A two-dimensional area designated by the FAA as eligible for flight of sUAS without remote id capabilities.

**LAANC** – Low Altitude Authorization and Notification Capability – a partnership p between the FAA and industry in which sUAS pilots may request approval for airspace authorization at altitudes of 400 feet and under in controlled airspace.

**TRUST** – The Recreational UAS Safety Test – a free exam that recreational pilots are required to take (and pass) before flying as a hobby.

3. Standard Operating Procedures

    a. Flight eligibility

        i. Crew - DCB's UAS instructors will need to hold a remote pilot license with a small unmanned aircraft rating or higher, meet all certification, currency, and any other requirement in conjunction with part 107 rules. It is the responsibility of the campus's UAS instructors to oversee student UAS operations. All UAS instructors on campus will share the responsibility of ensuring safe flight on campus.

            All students/staff/faculty that serve as a crew member during a mission on campus or at a campus sponsored event will need to meet one of the following requirements: (1) have taken TRUST, (2) be under direct supervision of someone with a part 107 license, (3) have a part 107 license.

        ii. Equipment – All drones weighing over 0.55 lbs (249 grams) must be registered with the FAA. Any drones flown under 14 CFR part 107 must be registered with the FAA.

    b. Preflight procedures - All class meetings or other flying will utilize a checklist to determine whether or not flight is safe. The checklist is attached in Appendix A. The list encompasses 4 areas: (1) RPIC and crew fitness for flight (2) airspace compliance (3) weather conditions and (4) equipment inspection. Pilots crew will need to meet all requirements to considered ready to fly.

        i. Fitness for flight

1. RPIC and crew will respond to the checklist in Appendix A and rate themselves on physical and mental health, as well as current cognitive state.

ii. Airspace Compliance
    1. Prior to flights, a mission plan will be developed and airspace research will done to determine if advance notice or LAANC authorization will be needed prior to flight.

    2. FAA's B4UFLY app (or similar application) will be consulted IMMEDIATELY before takeoff to check for any changes in airspace requirements such as a temporary flight restrictions (TFR).

    3. The flight area will be assessed for obstacles and other aircraft.

    4. An area of operation will be set up with appropriate space for takeoff and landing. This will be marked with a helipad.

iii. Weather conditions
    1. Instructors will be vetting weather conditions for at least 24-hours prior to flight.

    2. Weather conditions will again be checked prior to takeoff using UAV Forecast, METAR reports, or the most local and recent weather forecast.

        a. Weather conditions will meet flight requirements when:
            - Visibility at least 3 statute miles.
            - Wind Speeds are less than 30 mph.
            - Temperatures are between 10°F (-12°C) and 90°F(32°C).
            - Cloud base is at least 500 ft above the planned flight altitude.
            - There is no precipitation or the precipitation chances are less than 60%.

iv. Equipment Checks
    1. Equipment checks will ensure the airworthiness of the battery, airframe, propellers, controller, and any other ancillary equipment used in the mission. Equipment will be turned on to ensure link is established between all components. All sUAS will be allowed to hover at least 15 to 30 seconds prior true flight. This is so the pilot and crew can listen for any unusual noises and observe the propeller rotation.

c. Mission Basics

i. General flight

1. Drones will be flown for educational purposes on campus. Any paid flights will be done or supervised by a part 107 instructor.

2. No unsafe/erratic flight behavior – the instructor reserves the right to take over in the instance of unsafe or erratic behavior. Erratic or hazardous flight can include, but is not limited to, interference with manned aircraft, overloading an aircraft, flying over people not participating in the mission, and inattentiveness to surroundings.

3. All sUAS regulations and operating limits must be followed in accordance with 14 CFR part 107.

4. No illegal activity may be conducted with drones on campus – drones will be flown in accordance with Federal, State, and Local laws to the best of knowledge.

5. Drones not equipped with remote ID will remain inside the boundaries of the FRIA (note both operator and drone need to be inside the FRIA).

ii. Emergency Procedures

1. Preflight checks and flight briefings will help all crew members plan ahead to avoid emergencies. However, some emergencies cannot be avoided. When an emergency arises, an emergency maneuver may be necessary to avoid an accident. Emergency maneuvers may include, switching from automated to manual mode, switching from landing to hovering if someone/something encroaches your landing area, or engaging a return to home feature. If an emergency maneuver is used it is considered best practice for the person manipulating the controls to land as soon as possible and analyze the situation to determine if resuming flight is safe. Any emergency maneuvers will be noted in the flight log (See d.ii. in this section).

d. Post-flight Procedures

i. Briefing

1. After each flight, the RPIC will brief the crew on the success of the mission. The purpose of this will be two-fold:

a. As the program is for educational learning, the brief will provide feedback to the students involved in the operation. They will be able to use that feedback in future flights.

b. It will also serve as feedback for the RPIC to strengthen communication with the students and improve lessons and course components.

ii. Logging flights and maintenance

1. Flights will be logged in accordance with FAA part 107 policy. All records will be kept on file for 2 years.

2. Maintenance records will be kept on any repairs/replacements to the drone. Time on individual batteries will also be logged to assisting in equipment maintenance and procurement. These records will be kept until a drone (or battery) is retired from the inventory.

3. Appendix B shows a sample log for flights and maintenance/batteries.

iii. Equipment checks on the battery, airframe, propellers, controller, and any other ancillary equipment used in the mission will be completed at the conclusion of the mission.

4. Inventory of DCB's sUAS equipment

The inventory of DCB's sUAS equipment will follow the inventory procedures set forth in policy FS.801.1. In addition, all drones (even those valued at less than $2,500) will be inventoried. In cases where FAA registration is required, registration numbers and information will be included in the inventory list. Ancillary sUAS equipment and supplies will be inventoried at the discretion of the sUAS instructors.

Appendix A. Preflight Checklist.

| | Date: | Date: | Date: | Date: |
|---|---|---|---|---|
| | | | | |
| **Fitness for Flight** | | | | |
| *I feel good and well rested.* | | | | |
| *I am not under pressure or undue stress.* | | | | |
| *I do not feel hurried.* | | | | |
| *I have not been consuming alcohol or using drugs in the past 8 hours.* | | | | |
| | | | | |
| **Airspace** | | | | |
| *Flight Area?* | On campus FRIA/ Off-campus Location | On campus FRIA/Off-campus Location | On campus FRIA/Off-campus Location | On campus FRIA/Off-campus Location |
| *If Off Campus,is the remote id transmitter attached?* | | | | |
| *If Off Campus, what airspace are you flying in?* | | | | |
| *LAANC Approval obtained* | | | | |
| *Prior to flight: check for any TFRs* | | | | |
| *Flight area assessed for obstacles or other aircraft?* | | | | |
| *Area of operation set up* | | | | |
| | | | | |
| **Weather** | | | | |
| *Visibility (at least 3 SM)* | | | | |
| *Wind Speed (< 30mph)* | | | | |
| *Temperature (10F<Temp<90)* | | | | |
| *Cloud Base (500ft above altitude)* | | | | |
| *Precip. Chances (< 60%)* | | | | |
| | | | | |
| **Equipment** | | | | |
| *Batteries charged and not puffy* | | | | |
| *Airframe is stable and free of cracks* | | | | |
| *Propellers are tightened properly and airworthy* | | | | |
| *Controller is charged* | | | | |
| *Is remote ID transmitter working (if applicable)* | | | | |
| *Turn on equipment and ensure link* | | | | |
| *Takeoff and hover 15 to 30 seconds* | | | | |

Appendix B. Flight Log and Maintenance Examples.

| Date | Year | Time | Aircraft Name | Location | Airspace Class | Details/ Notes | Flight Time | Takeoffs | Landings | Battery 1 | Batt 1 Up | Batt 1 Dn | Battery 2 | Batt 2 Up | Batt 2 Dn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct 4, 2020 | 2020 | 11:15 | Polly 1 | Baseball Diamond | E | Photos | 0.25 | 1 | 1 | Anafi1 20200725 | 100% | 50% | Anafi2 20200725 | - | - |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

| Date | Aircraft | Maintenance Detail |
|---|---|---|
| Mar 21, 2021 | Polly 1 | Changed Props; software update |
| Nov 2, 2022 | Polly 1 | Replaced arm (right front); replaced props |
| | | |
| | | |
| | | |
| | | |
| | | |

| The Drone Trainer - UAV Battery Logbook v2.0 - Dakota College at Bottineau | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | All Time | | | | 2020 | | | | 2021 | | | | 2022 | | | | 2023 | | | |
| Battery Name | Inv. Number | Missions | Hours | Avg Up | Avg Dn | M | H | U | D | M | H | U | D | M | H | U | D | M | H | U | D |
| Anafi 1 | 20200725 | 23 | 280.0 | 90% | 28% | 8 | 90 | 90% | 35% | 13 | 130 | 95% | 20% | 6 | 60 | 85% | 30% | 0 | 0 | 0% | 0% |
| Anafi 2 - Damaged | 20200725 | 15 | 85.0 | 100% | 35% | 8 | 85 | 100% | 35% | 0 | 0 | 0% | 0% | 0 | 0 | 0% | 0% | 0 | 0 | 0% | 0% |
| Anafi 3 | 20200725 | 20 | 250.0 | 95% | 28% | 7 | 60 | 100% | 35% | 12 | 120 | 90% | 25% | 6 | 70 | 95% | 25% | 0 | 0 | 0% | 0% |
| Anafi 4 | 20210330 | 10 | 85.0 | 98% | 38% | 0 | 0 | 0% | 0% | 3 | 40 | 100% | 40% | 4 | 45 | 95% | 35% | 0 | 0 | 0% | 0% |
| Anafi 5 | 20230528 | 2 | 1.0 | 80% | 42% | 0 | 0 | 0% | 0% | 0 | 0 | 0% | 0% | 0 | 0 | 0% | 0% | 2 | 1 | 80% | 42% |