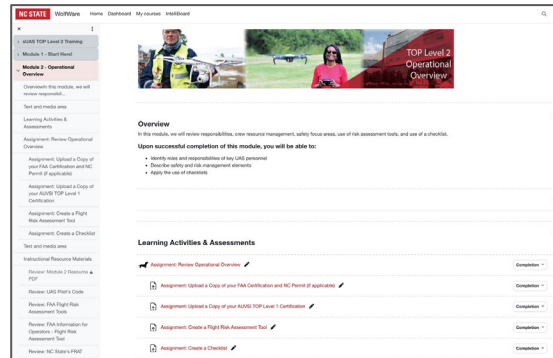
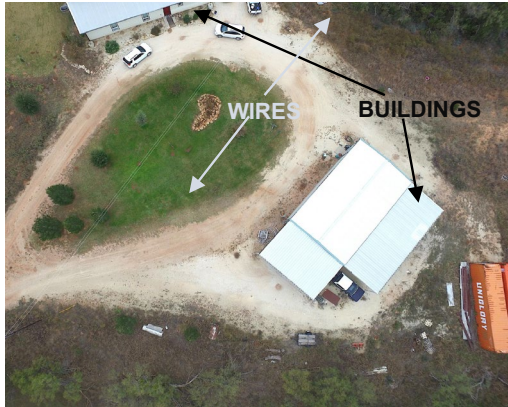
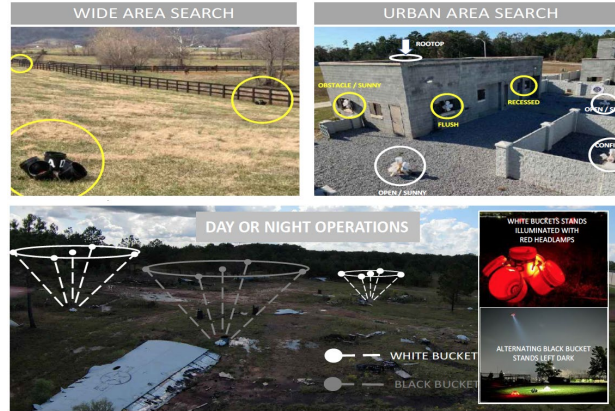
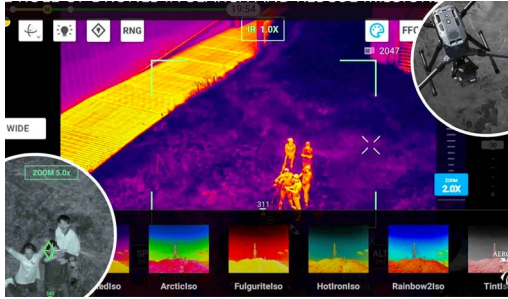
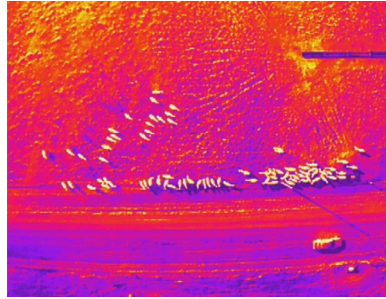


State of NC Insurance & Risk Management Conference

Drone - UAVs and Compliance





Use Cases

- Advanced Wireless Communication
- Agriculture
- Construction
- Disaster Preparedness
- Environmental Monitoring
- Forest Management
- Geospatial Analytics
- Inspections
- Surveying
- Swarm Robotics
- Terrain Analysis
- Traffic Monitoring

Drone Sales in the United States

**\$8.3
Billion**

As of 2025



**16.9% projected growth
in the next 10 years**



**\$31.34 Billion market
projection by 2034**



**481,760 FAA certified
drone pilots**
(increase from 200K in 2021)

Why do we care?



Drone Incursions

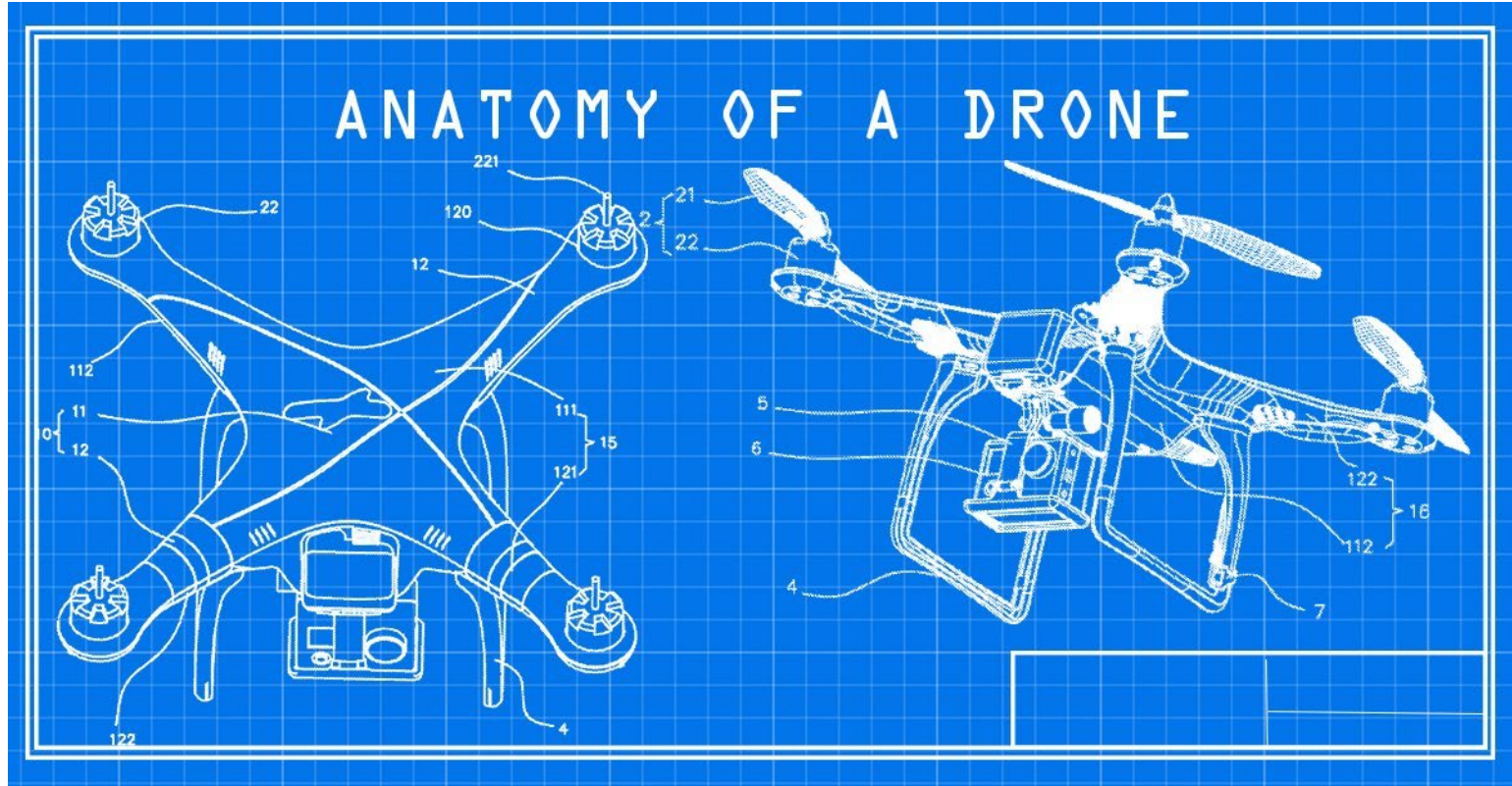


Part 108 Big Picture - It is Coming!



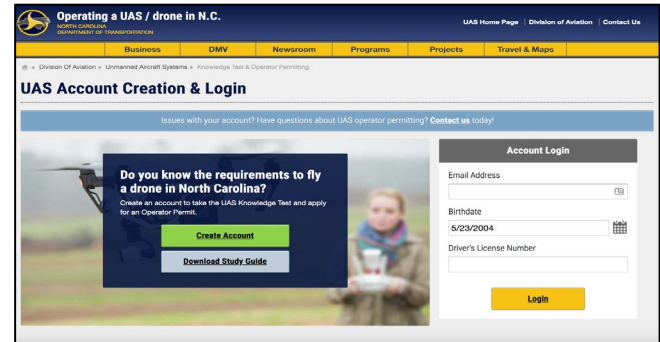
- Only pathway to fly UAS beyond visual line of sight in the United States.
- UAS flown under Part 108 will be autonomous.
- No relationship between Part 107 and the proposed Part 108.
- No certificated pilot under Part 108.
- Oversight will remain with the FAA, while TSA will continue to address security aspects.
- Manufacturers will play a central role through airworthiness acceptance of UAS designs based on consensus standards.
- Operators will hold either permits or certificates depending on the scale and risk of their activities Operator means a person that conducts operations under this part.
- Possible requirements include an operations manual, recordkeeping, duty and rest, along with training.
- Flight over people - population density.
- Operations will either be permitted or certificated (higher risk); Types include package delivery, agricultural, aerial surveying, civic interest, training, demonstrations, and recreational.
- Collision avoidance capabilities along with detect and avoid measures.

Understand the Basics



Type of Pilot - FAA Certified vs. Recreational

- FAA certification
 - Online test prep options - most do cost money
 - Free study resources available
 - Test is in person at an FAA approved testing site - 70% to pass, cost is \$175
 - Good for two years, recert is free and online
 - Certified in all 50 states, DC, and US territories
- Recreational
 - TRUST knowledge and awareness test - NOT a certification
- Pilots no longer need a permit (commercial or government) in the state of NC



Remote ID



NC UAS Laws



Almost all states have passed laws that regulate UAS and NC is one of them.

Local jurisdictions in over 30 states have enacted their own regulations, most often regarding take off/landing areas.

Topic	What North Carolina's Law Says
Prisons	It is illegal to fly a UAS over any prison, state or federal (N.C. G.S. 15A-300.3).
Hunting & Fishing	Operators may not use a UAS to disrupt wildlife resources or the lawful taking of wildlife. It is also against the law to use a UAS in the process of taking wildlife resources (N.C. G.S. 113.295).
Interference with Manned Flights	Operators may not damage, disrupt the operation of, or otherwise interfere with manned flights (N.C. G.S. 14-280.3).
Launch & Recovery Sites	It is illegal to launch or recover a UAS from either private or state property without the consent of the property's owner (N.C. G.S. 15A-300.2). Local and federal property have their own laws and regulations governing the launch and recovery of UAS.
Surveillance	It is illegal to use an unmanned aircraft system to take or distribute images of a person or their home without their consent (N.C. G.S. 15A-300.1 and N.C. G.S. 14-401.25).
Weapons	Attaching a weapon to a UAS is a Class E felony (N.C. G.S. 14-401.24).
Knowledge Test	An operator must pass the N.C. Department of Transportation's UAS Operator's Knowledge Test to ensure their safety and the safety of those around them (N.C. G.S. 63-95).
Permit	With the passing of the UAS Operator's Knowledge Test as a prerequisite, commercial operators may request a UAS permit from the NCDOT Division of Aviation (N.C. G.S. 63-96).



B₃ E₁

T₁ H₄ E₁

C₃ H₄ A₁ N₁ G₂ E₁

UAS Flight Operations Manual

For

NC STATE UNIVERSITY

909 Capability Drive, Suite 3200

Raleigh, NC 27695

Version 000007

September 20, 2023

Unmanned Aerial Systems (UAS) Information

UAS Activities at NC State

Unmanned Aerial Systems, also referred to as drones, offer great potential as tools for research and teaching. [NC State regulation 10.10.09, Operation of Unmanned Aircraft Systems](#) establishes a framework for identifying, managing, and mitigating risk when using UAS, in order to ensure compliance with all State and Federal laws and regulations, and in furtherance of NC State's institutional goals and objectives.

We have adopted the [UAS Pilot's Code \(UASPC\)](#) developed by the Permanent Editorial Board of the Aviators Code Initiative and University Aviation Association, including the seven principles and recommended practices. Each pilot will self-certify to the UASPC upon submission of the Drone Pilot Registration Request form.

For more information on NC State's requirements and procedures for operating UAS, as well as some helpful tips, see [NC State Requirements & Tips](#) document.

General Rule

No individual shall operate a UAS on, in or over any university premises without permission.

Approvals for UAS Activities

University UAS Operations

NC State Departments and Units may conduct UAS operations in compliance with [NC State regulation 10.10.09, Operation of Unmanned Aircraft Systems](#), applicable laws, and the requirements below. All NC State Departments and Units must provide the required notification before conducting UAS operations.

Commercial Photography or Filming

Individuals or companies desiring to operate UAS on university premises for commercial photography or filming purposes must contact [University Communications](#) and obtain approval prior to conducting any flights.

UNMANNED AERIAL SYSTEMS (UAS) INFORMATION

› [Unmanned Aerial Systems \(UAS\) Resources](#)

IT RULES, REGULATIONS AND PROCEDURES →

- › [Email Retention](#)
- › [Guidelines for Non-Employees with System Administration Duties](#)
- › [NC State Rules and Regulations for Student Use of IT](#)
- › [One Phish / 2-Step Standard](#)
- › [Rules and Regulations for Employee Use of IT](#)
- › [Computer Use Regulation Summary and Guidance](#)
- › [Computing Lab Use Rules](#)
- › [Rules for Implementing Wireless Networks at NC State](#)
- › [Unity Locker Rental Service](#)
- › [Unmanned Aerial Systems \(UAS\) Information](#)



RISK ASSESSMENT

Pilot's Name: _____ Flight From: _____ To: _____

SLEEP

1. Did not sleep well or less than 8 hours ☐ 2
2. Slept well ☐ 0

HOW IS THE DAY GOING?

1. Seems like one thing after another (late, making errors, out of step) ☐ 3
2. Great day ☐ 0

HOW DO YOU FEEL?

1. Have a cold or ill ☐ 4
2. Feel great ☐ 0
3. Feel a bit off ☐ 2

WEATHER AT TERMINATION

1. Greater than 5 miles visibility and 3,000 feet ceilings ☐ 1
2. At least 3 miles visibility and 1,000 feet ceilings, but less than 3,000 feet ceilings and 5 miles visibility ☐ 3
3. IMC conditions ☐ 4

Column total ☐ _____

HOW IS THE FLIGHT?

1. Day? ☐ 1
2. Night? ☐ 3

PLANNING

1. Rush to get off ground ☐ 3
2. No hurry ☐ 1
3. Used charts and computer to assist ☐ 0
4. Used computer program for all planning ☐ 0
5. Did you verify weight and balance? Yes ☐ 3 No ☐ 0
6. Did you evaluate performance? Yes ☐ 0 No ☐ 3
7. Do you brief your passengers on the ground and in flight? Yes ☐ 0 No ☐ 2

Column total ☐ _____

LEFT COLUMN TOTAL ☐ _____ + RIGHT COLUMN TOTAL ☐ _____ = TOTAL SCORE ☐ _____

Risk Scale:

Low Risk (0) Not Complex Flight (10) Exercise Caution (20) Area of Concern (30) Endangerment (40)

Example Risk Assessment Form

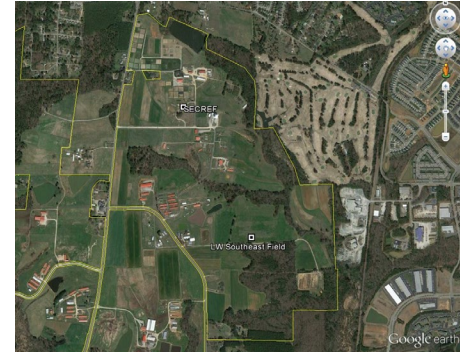
UAS Flight Risk Assessment Tool (FRAT) v000002 01/04/22

RPIC: _____ Date and Time: _____ Location: _____

		1	2	3	4	5	Rating
Operational Factors	Type of Operation	Normal	Demo	Training/ Recurrency	Mx Checkout	Test Flight	
	Duration of Operation	< 1 hour	1-2 hours	2-4 hours	4-6 hours	>6 hours	
	Aircraft Takeoff Weight	<3lbs	4-10lbs	11-20lbs	21-30lbs	31-55lbs	
	Aircraft Certification Level	OEM	OEM Modified		Custom Built		
Pilot in Command Factors	Simultaneous Operations	1 UA		2 UAs	3 UAs	>3 UAs	
	Hours of Rest in Last 24 Hours	>8	7-8	5-6	3-5	<3	
	# of Flights in Type	>100	50-100	11-50	1-10	0	
	# of Flights in Last 90 Days	>20	15-20	10-14	5-9	<5	
Environmental Factors	Total UAS Hours	>100	31-100	6-30	2-5	<2	
	Forecast Wind	<8 kts	9-12 kts	13-15 kts	16-20 kts	>20 kts	
	Time of Day	Day	Civil Twilight		Night		
	RPIC Location	Ground			Moving Vehicle	Maritime Vessel	
Environmental Factors	Weather Forecast for Operation	Clear	Reducing Visibility	Ceiling <700ft	Precip	T-Storm	
	Surrounding Area	Open Field / Indoor no spec	Vegetation	Mountainous / Indoor with spec	Urban	Crowds/ Assemblies	
Total Risk Score→							
Status Go/No Go→							
LOW - No unusual hazards. Use normal flight planning and operating procedures.							14-30
MEDIUM - Elevated risk. Conduct flight planning with extra care. Review personal minimums and operating procedures to ensure that all standards are being met. Consider alternatives to reduce risk.							31- 40
HIGH - Conditions present much higher than normal risk. Conduct flight planning with extra care and review all elements to identify those that could be modified to reduce risk. Develop contingency plans before flight to deal with high risk items. Decide beforehand on alternates and brief crewmembers on special precautions to be taken during the flight. Consider delaying flight until conditions improve and risk is reduced. Requires review by IRC members for approval.							>41 Total

Mission and Operations

- Authorizations
 - Land owner
 - COA/333
 - NOTAM/TRF
 - NC Permit (if applicable)
- MOUs
- Site Assessment
 - Take off and landing area
 - Alternate landing locations
 - Hazards - FRAT
- Weather
- Checklist
- Flight plan



DJI Mavic Pro Checklist

1. Preflight Inspection Fuselage.....no cracks or visible damage If Equipped: Vision Position System (FWD and Below).....clean Camera Gimbal Brace.....remove Camera Mount.....inspect Camera Lens.....clean & unscrewed Propeller Mounts.....inspect and secure Propellers.....no major nicks Ground Station.....inspect	
2. GCS Setup All GCS Devices.....power on Mobile Device.....as required Smart Controller (if available).....as required Flight Application.....open and verify Remote Controller Harness.....as required Remote Controller Battery.....33% min	
3. Aircraft Setup Battery.....check charge level & install Lens Filter.....as required SD Card.....installed Propellers.....install and verify Aircraft Launch Location.....set aircraft on location Aircraft Battery.....turn on Aircraft Audible Tone.....verify Aircraft Battery LEDs.....verify Aircraft Status LEDs.....verify	
4. Prelaunch Checklist (Optional) Firmware.....verify current version Compass & IMU.....check & calibrate if necessary Main Controller Settings.....check Max Flight Altitude.....set (optional) Max Flight Distance.....enable & set (optional) Return to Home Altitude.....set altitude (optional) RC Signal Lost Mode.....verify and set Camera Settings.....check Format SD card.....as needed (optional) Control Link Health.....verify stable/ select channel Aircraft Battery %.....check Gimbal Mode.....select (if equipped) Flight Mode Switch.....select (if equipped) GPS Status.....>4 GPS satellites	
5. Takeoff (Memorize Bold Items) Camera.....record as required Aircraft Status.....verify Motors Start.....announce "clear props" Propellers.....check all rotating Home Point.....verify updated Vertical Takeoff.....command Hover.....4-8 feet to check position holding Control Response Test.....conduct	
6. In-Flight Checks Obstacles and Air Traffic.....avoid Battery.....monitor level Flight Mode.....as required Aircraft Status.....as required Visual Line of Sight.....maintain Flight over People.....per FAA part 107.105 Transfer Control.....as required	
7. Landing (Memorize Bold Item) Camera.....nadir as required Intent to Land.....announce Descent.....initiate 1-5 Foot Hover.....establish Camera.....forward/side Touchdown/ Antiland.....execute Throttle.....hold down Motors.....verify off	
8. Additional Flights / Turnaround Review steps 2 - 4 as necessary Aircraft Battery.....replace if required Aircraft Battery % and LED.....verify Aircraft Launch Location.....reset aircraft on location Home Point.....verify updated GPS Status.....>4 GPS satellites Takeoff Sequence (step 05).....execute	
9. Postflight Inspection Aircraft Power.....off Battery LEDs.....verify off Remote Controller and LEDs.....off Flight Application.....close as required Propellers.....remove as required Camera.....verify condition Fuselage.....no cracks or visible damage Aircraft Battery.....remove SD Card.....remove / download as required All Components.....store as required	

Types of Drones





HOME

Register Your Drone

Drones must be registered with the FAA.

[FAADroneZone Services ▸](#)

Welcome to the FAADroneZone

FAADroneZone is the official FAA website for managing drone services.

[FAADRONEZONE SERVICES](#)

Helpful Links

- [Download the B4UFLY Mobile App](#)
- [Take T.R.U.S.T.](#)
- [UAS en Español](#)
- [Check out Hot Topics in U.A.S.](#)
- [Get an airspace authorization through LAANC](#)

Reporting Process

If there has been an injury and/or damage to property, including to university/organization owned equipment, please contact the following offices:

Police/EMS - 911 (emergency) or 919.515.3000 (this is the University Police non-emergency number)

- The police can do a report if it is warranted.

Insurance and Risk Management

- <https://irm.ehps.ncsu.edu/home/how-to-file-a-claim/>
 - There is a form for property loss and incident reports (one for students/visitors and one for employees). The incident report should be filled out at minimum. If there is damage or loss of property then the property loss form should also be completed.
- Contact person for questions regarding drone insurance is Kimberly Howell, 919.515.6135, kvhowel2@ncsu.edu

AND

- Contact the Chief Pilot or another member of the Initial Review Committee.
- Communicate with your supervisor or whoever is responsible for the flight.
- Document the incident in your flight log and in DroneLogbook.

Types of Drone Insurance Coverage



- ▶ **Liability Insurance** – Covers property damage and injuries, with standard \$1M+ coverage.
- ▶ **Hull Insurance** – Protects your drone from crashes and theft (in some plans).
- ▶ **Payload & Equipment Insurance** – Covers cameras, sensors, and ground gear.
- ▶ **Personal Injury Insurance** – Protects against privacy claims and defamation.
- ▶ **Non-Owned Drone Insurance** – Covers rented or borrowed drones.

Insurance Recommendations

Category	Coverage	Projected Cost	Notes
Hobbyist / Recreational	Basic liability + Hull	\$50 - \$150 / year	Optional but handy to have personal protection
Freelance / Small Business	Full commercial coverage	\$300 - \$800 / year	Can be required by clients
Enterprise / Fleet	Custom enterprise UAS plan	\$1,000 - \$10,000 / year	Includes multiple drones and employee coverage



DRONE INSURANCE

NC State

- Provide drone information to Insurance and Risk Management. They need the make, model, model year, serial number, and FAA registration number for each device.
- There is a fee of \$50/year for liability coverage and this is required. For damage coverage a quote will need to be submitted. Damage coverage is not required.

Commercial Providers

Academy of Model Aeronautics (AMA)

- Full membership for adults is \$75/year. This includes \$2,500,000 in personal liability insurance coverage. This can only be used for recreational flying.

BWI | Fly

- great option for commercial pilots working in high-risk applications. offers hull insurance and does not charge for additional COIs, which is great for larger companies working with numerous pilots and UAVs.

DroneInsurance.com (SkyWatch)

- Damage and replacement coverage on a monthly basis and on-demand flight liability coverage on a daily basis.



Certified Training. Trusted Operators.

As uncrewed systems become more integrated into commercial, public safety, and government operations, professional certification is essential to ensure safety, consistency, and public trust. AUVSI's Trusted Operator program was developed in collaboration with industry leaders to align remote pilot training with recognized standards and to support global acceptance of uncrewed aircraft systems (UAS).

Through Trusted Operator, AUVSI accredits UAS training providers who demonstrate compliance with a rigorous set of protocols and operational benchmarks. These providers are evaluated on curriculum quality, instructor qualifications, safety management, and adherence to industry best practices. Accredited providers are authorized to issue Trusted Operator certifications to students who successfully complete their programs, creating a consistent, standards-based credential that is recognized across the industry.

Trusted UAS Operator certification is also recognized by leading aerospace insurers, with potential insurance benefits for certified operators.



To date, our Training Providers have issued over 2500 Trusted Operator Certificates in 31 countries around the world.

Countries include: Angola, Benin, Botswana, Cameroon, Canada, China, Ethiopia, Gambia, Ghana, Guam, India, Kenya, Malawi, Malaysia, Mozambique, Namibia, Niger, Nigeria, Peru,

Rwanda, Saudi Arabia, Sierra Leone, South Africa, Sudan, Switzerland, Tanzania, Uganda, United Kingdom, United States, Zambia, Zimbabwe



Turn Certification Into Cost Savings

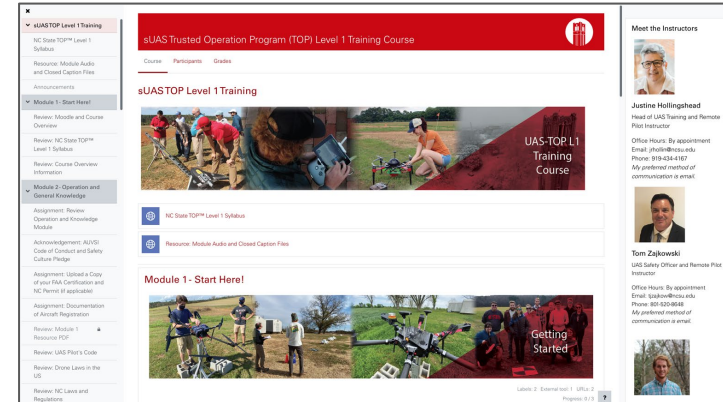
Trusted UAS Operator certification is recognized by leading aerospace insurers. Certified operators may be eligible for insurance discounts, helping reduce operational risk and total cost of ownership.

[GET CERTIFIED](#)[TRUSTED UAS OPERATOR](#)[OPERATOR DIRECTORY](#)[TRAINING PROVIDERS](#)

Drone Pilot Training



- Asynchronous self-paced courses that can be facilitated in person if needed.
- Prerequisite is an FAA Part 107 Remote Pilot Certificate.
- Final exam for each course and a practical flight assessment (PFA) for Trusted Operator levels 2 and 3.
- The pilot can be issued a certificate and registered online with AUVSI's website upon successful completion.





- Standards of Performance Evaluation Criteria

- Height and Direction
- Target Alignment
- Flight Stability
- Take Off and Landing

- Procedural Standards Scenarios

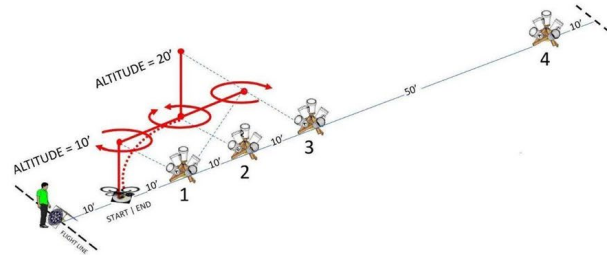
- Metrics

- Completeness
- Score
- Efficiency

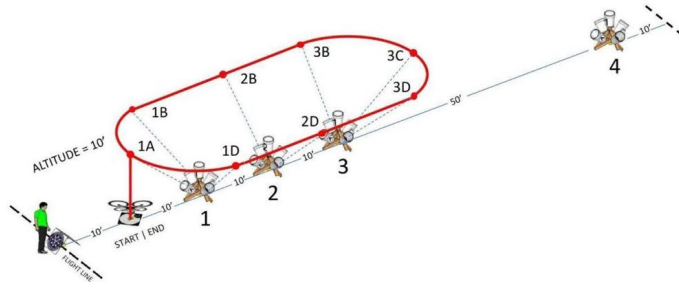


TOP PTS Maneuvers

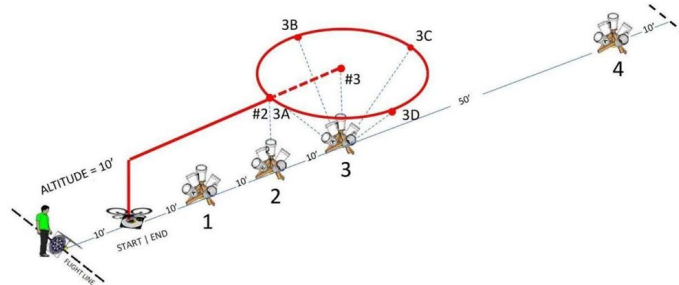
Maneuver 1 - Position Test



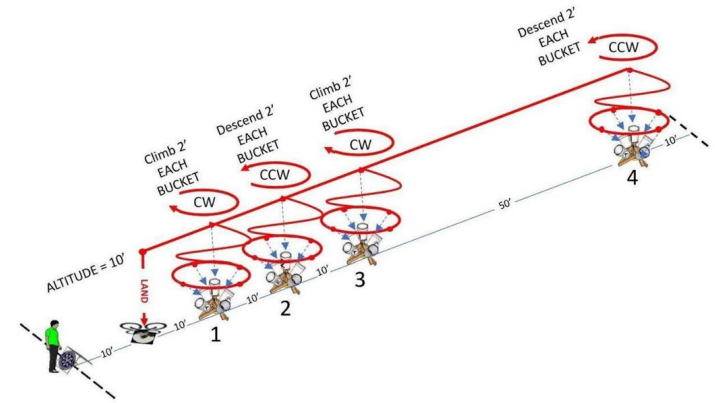
Maneuver 2 - Traverse Test



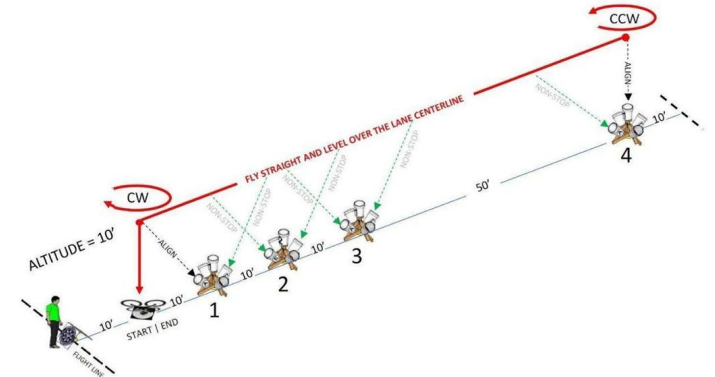
Maneuver 3 - Orbit Test



Maneuver 4 - Inspect Test



Maneuver 5 - Recon Test



Flight Simulator



Flying at Night



Pilot and Flight Management Systems



Section 1 of 4

Drone Pilot Registration Request for NC State

This form initiates the process to be recognized as a drone pilot connected with NC State University. This only needs to be done one time and includes NC State affiliated AND non-university affiliated pilots.

As a pilot, you must have your FAA remote pilot certification number, NC permit, AND have at least 5 documented hours of flight time.

If you have questions please contact Justine Hollingshead at jrhollin@ncsu.edu, Tom Zajkowski at tjzajkow@ncsu.edu, or Evan Arnold at eparold@ncsu.edu.

Email *

Valid email

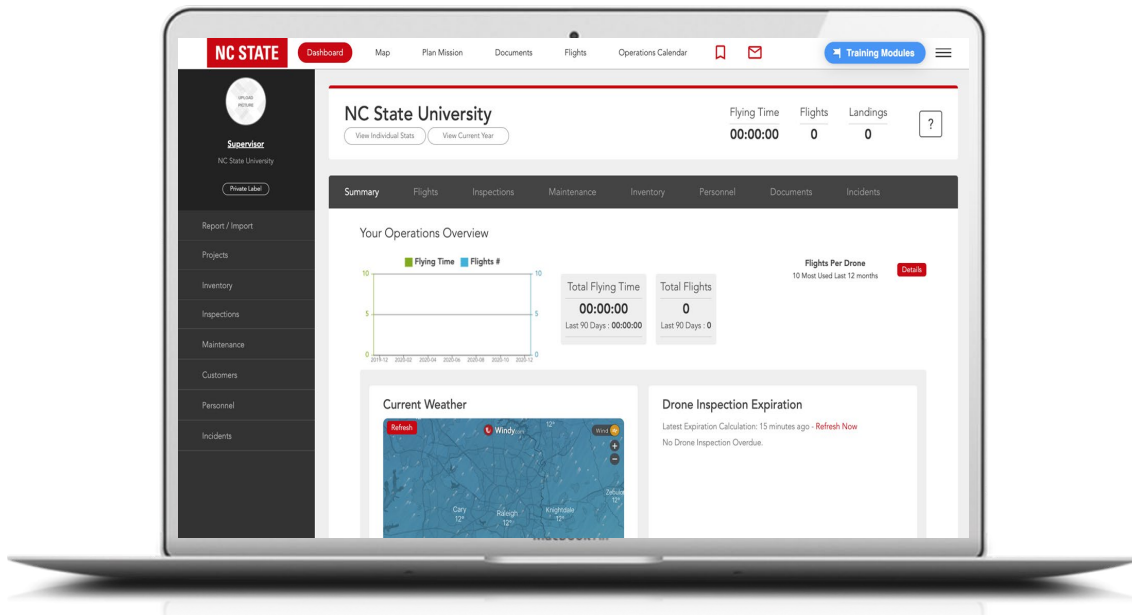
This form is collecting emails. [Change settings](#)

Pilot's Full Name *

Short answer text

Pilot's Mobile Phone Number *

Short answer text



NC STATE UNIVERSITY

Drone Activities



NC State Drones



ITRE

Institute for Transportation
Research and Education

go.ncsu.edu/drones

Questions and Answers

Justine Hollingshead
Assistant Vice Chancellor and UAS Training Coordinator
NC State University

jrhollin@ncsu.edu

919-434-4167

[linkedin.com/in/jholli99](https://www.linkedin.com/in/jholli99)