



2025 Introduction to Drone Technology

Program CIP: 49.0102 — Airline/Commercial/Professional Pilot and Flight Crew

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The Research and Curriculum Unit (RCU), located in Starkville, as part of Mississippi State University (MSU), was established to foster educational enhancements and innovations. In keeping with the land-grant mission of MSU, the RCU is dedicated to improving the quality of life for Mississippians. The RCU enhances the intellectual and professional development of Mississippi students and educators while applying knowledge and educational research to the lives of the people of the state. The RCU works within the contexts of curriculum development and revision, research, assessment, professional development, and industrial training.

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Dr. Ronnie L. McGehee
Mr. Bill Jacobs
Mr. Mike Pruitt
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Mr. Matt Mayo
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Standards

Standards and alignment crosswalks may be referenced in the appendix. Depending on the curriculum, these crosswalks could identify alignment to the standards mentioned below, as well as possible related academic topics as required in the Subject Area Testing Program in Algebra I, Biology I, English II, and U.S. History from 1877, which could be integrated into the content of the units. Mississippi's CTE introduction to drone technology curriculum is aligned with the following standards:

Federal Aviation Administration (FAA) Part 107

The mission of the FAA is to provide the safest, most efficient aerospace system in the world. To fly a drone under the FAA's small, unmanned aircraft system (sUAS) Rule (Part 107), one is required to obtain a Remote Pilot Certificate from the FAA. This certificate demonstrates that one understands regulations, operating requirements, and procedures for safely flying a drone. It does not demonstrate flying ability or experience. A requirement for obtaining this certificate is to master the standards of and pass the initial aeronautical knowledge exam. According to the Code of Federal Regulations (CFR), any person may reproduce or republish any material appearing in any regular or special edition of the Federal Register (1 CFR § 2.6). There are no restrictions regarding what is reproduced, who can reproduce it, or where it can be reproduced. The Office of the Federal Register (OFR) of the National Archives and Records Administration (NARA) and the U.S. Government Publishing Office (GPO) jointly administer the federalregister.gov website. (ecfr.gov/current/title-14/chapter-I/subchapter-F/part-107)
faa.gov/uas/commercial_operators/become_a_drone_pilot

International Society for Technology in Education Standards (ISTE)

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iste.org

College- and Career-Ready Standards

College- and career-readiness standards emphasize critical thinking, teamwork, and problem-solving skills. Students will learn the skills and abilities demanded by the workforce of today and the future. Mississippi adopted Mississippi College- and Career-Readiness Standards (MCCRS) to provide a consistent, clear understanding of what students are expected to learn and so teachers and parents know what they need to do to help them.
mdek12.org/oe/college-and-career-readiness-standards

Preface

Secondary CTE programs in Mississippi face many challenges resulting from sweeping educational reforms at the national and state levels. Schools and teachers are increasingly being held accountable for providing applied learning activities to every student in the classroom. This accountability is measured through increased requirements for mastery and attainment of competency as documented through both formative and summative assessments. This document provides information, tools, and solutions that will aid students, teachers, and schools in creating and implementing applied, interactive, and innovative lessons. Through best practices, alignment with national standards and certifications, community partnerships, and a hands-on, student-centered concept, educators will be able to truly engage students in meaningful and collaborative learning opportunities.

The courses in this document reflect the statutory requirements as found in Section 37-3-49, *Mississippi Code of 1972*, as amended (Section 37-3-46). In addition, this curriculum reflects guidelines imposed by federal and state mandates (Laws, 1988, Ch. 487, §14; Laws, 1991, Ch. 423, §1; Laws, 1992, Ch. 519, §4 eff. from and after July 1, 1992; Strengthening Career and Technical Education for the 21st Century Act, 2019 [Perkins V]; and Every Student Succeeds Act, 2015).

Mississippi Teacher Professional Resources

The following are resources for Mississippi teachers:

Curriculum, Assessment, Professional Learning

Program resources can be found at the RCU's website, rcu.msstate.edu.

Learning Management System: An Online Resource

Learning management system information can be found on the RCU's website, under Professional Learning.

Should you need additional instructions, call the RCU at 662.325.2510.

Executive Summary

Pathway Description

This course is intended to be an add-on class for students interested in using drones in their respective career fields of choice. Skills acquired in this course will be applicable in many industry sectors, including military, agriculture, engineering, law enforcement, emergency management, forestry, real estate, marketing, transportation, and more. It is imperative students receive ample supervised flight time outside of this course to ensure safe habits are practiced and skills are mastered.

College, Career, and Certifications

This course will prepare students as they study for and pass their FAA Part 107 certification exam in order to receive their Federal Aviation Administration (FAA) issued Remote Pilot Certificate. This will also enable those students who become FAA-certified commercial drone pilots to receive compensation while flying drones in FAA-controlled and uncontrolled national airspace. This basic (1-credit) introduction to drone technology course would be necessary for any students who would utilize drone technology as part of their selected professional career. Along with receiving their Part 107 certification, students will also hone their drone flight skills while implementing safety precautions when flying and safely charging/discharging either lithium polymer (LiPo), lithium-ion (Li-Ion), or other chemically based batteries. The Part 107 sUAS certificate demonstrates that the applicant understands the regulations, operating requirements, and procedures for safely flying drones. The certified commercial drone pilots this course produces can be a valuable resource for any company that has implemented drone technology.

Grade Level and Class Size Recommendations

It is recommended that students enter this program no sooner than 10th grade. Exceptions to this are a district-level decision based on class size, enrollment numbers, and student maturity. It is strongly recommended that the maximum class size for any UAS-related course is 12 students. This ensures the safety and individualized instruction necessary for each student as they develop their drone flight skills.

Student Prerequisites

For students to experience success in the program, the following student prerequisites are suggested:

1. C or higher in English (the previous year)
 2. C or higher in high school-level math (last course taken or the instructor can specify the level of math instruction needed)
 3. Instructor approval and TABE reading score (eighth grade or higher)
- or**
1. TABE reading and math score (eighth grade or higher)
 2. Instructor approval
- or**
1. Instructor approval

Applied Academic Credit

The latest academic credit information can be found at mdek12.org/ese/approved-course-for-the-secondary-schools.

Teacher Licensure

The latest teacher licensure information can be found at mdek12.org/oel/apply-for-an-educator-license.

Professional Learning

If you have specific questions about the content of any of the training sessions provided, please contact the RCU at 662.325.2510 or email helpdesk@rcu.msstate.edu.

Course Outlines

One 1-Carnegie Unit Course

This curriculum consists of one 1-credit course.

Introduction to Drone Technology—Course Code: **XXXXXX**

Unit	Title	Hours
1	UAS Safety Regulations and Operational Policies	15
2	UAS Flight Simulation	15
3	Multirotor Flight	35
4	FAA Part 107	75
Total		140

Career Pathway Outlook

Overview

Unmanned Aircraft Systems (UAS) drone technology allows experienced professionals from across a wide variety of career clusters to enhance their already prosperous careers. This technology helps them to see the bigger picture and make well-informed, data-related decisions and can be useful tools in almost every field of work. The need for skilled UAS operators across many industries is growing exponentially. There are numerous two-year and four-year UAS-related postsecondary degree programs, both in-state and out-of-state, that would allow students to pursue further education and training to enhance their skills and knowledge base. Students can apply their UAS-related skills and knowledge learned in this class as they pursue a degree and/or a career in agriculture, delivery services, disaster management, education and training, entertainment services, filmmaking and video production, geographical mapping and monitoring, infrastructure inspection and maintenance, military, mining, public relations, sales and marketing, public safety, real estate development, utilities, and construction

Needs of the Future Workforce

UAS technology is advancing rapidly and the uses for it are nearly endless. Industries have used simple drones for years and will continue to use them; however, their use and application so far are basic and superficial compared to the technology available. Highly skilled UAS operators are becoming more of a need throughout all industries. This need is so new that no job title has officially been created or data collected by any employment agency, including the Mississippi Department of Employment Security and Bureau of Labor Statistics. The needs and patterns of growth shown in Table 1.1 are those of the most popular industries employing drone operators for their skills.

Table 1.1: Current and Projected Occupation Report

Description	Jobs, 2020	Projected Jobs, 2030	Change (Number)	Change (Percent)	Average Hourly Earnings, 2024
Surveyors	390	400	10	2.6%	\$27.52
Engineers	2,230	2,290	60	2.7%	\$47.91
Drafters, Engineering Technicians, and Mapping Technicians	680	690	10	1.5%	\$21.41
Conservation Scientists	1,260	1,2980	20	1.6%	\$29.47
Foresters	170	180	10	5.9%	\$31.37
Atmospheric and Space Scientists	80	80	0	0%	\$35.83
Geoscientists	360	370	10	2.8%	\$48.88
Airline Pilots, Copilots, and Flight Engineers	130	140	10	7.7%	\$58.31

Source: Mississippi Department of Employment Security; mdes.ms.gov (2024).

Perkins V Requirements and Academic Infusion

This program meets Perkins V requirements of introducing students to and preparing them for

high-skill, high-wage occupations in UAS fields. It also offers students a program of study, including secondary, postsecondary, and institutions of higher learning courses, that will further prepare them for various careers involving UAS. Additionally, this curriculum is integrated with academic college- and career-readiness standards. Lastly, it focuses on ongoing and meaningful professional development for teachers as well as relationships with industry.

Transition to Postsecondary Education

The latest articulation information for secondary to postsecondary can be found at the Mississippi Community College Board website, mccb.edu.

Best Practices

Innovative Instructional Technologies

Classrooms should be equipped with tools that will teach today’s digital learners through applicable and modern practices. The introduction to drone technology educator’s goal should be to include teaching strategies that incorporate current technology. To make use of the latest online communication tools—wikis, blogs, podcasts, and social media platforms, for example—the classroom teacher is encouraged to use a learning management system that introduces students to education in an online environment and places more of the responsibility of learning on the student.

Differentiated Instruction

Students learn in a variety of ways, and numerous factors—students’ background, emotional health, and circumstances, for example—create unique learners. By providing various teaching and assessment strategies, students with various learning preferences can have more opportunities to succeed.

CTE Student Organizations

Teachers should investigate opportunities to sponsor a student organization. There are several here in Mississippi that will foster the types of learning expected from the introduction to drone technology curriculum. The Technology Student Association (TSA) and SkillsUSA are examples of student organizations that have many outlets for unmanned aircraft systems (UAS). Student organizations provide participants and members with growth opportunities and competitive events. They also open the doors to the world of drone technology-related careers and scholarship opportunities.

Cooperative Learning

Cooperative learning can help students understand topics when independent learning cannot. Therefore, you will see several opportunities in the introduction to drone technology curriculum for group work. To function in today’s workforce, students need to be able to work collaboratively with others and solve problems without excessive conflict. The introduction to drone technology curriculum provides opportunities for students to work together and help each other complete complex tasks. There are many field experiences within the introduction to drone technology curriculum that will allow and encourage collaboration with professionals currently in the drone technology-related field.

Work-Based Learning

Work-based learning is an extension of understanding competencies taught in the introduction to drone technology classroom. This curriculum is designed in a way that necessitates active involvement by the students in the community around them and the global environment. These real-world connections and applications link all types of students to knowledge, skills, and professional dispositions. Work-based learning should encompass ongoing and increasingly more complex involvement with local companies and drone technology-related professionals. Thus, supervised collaboration and immersion into the drone technology-related field around the students are keys to students’ success, knowledge, and skills development.

Professional Organizations

Association for Career and Technical Education (ACTE)

acteonline.org

Airborne International Response Team (AIRT) DRONERESPONDERS

droneresponders.org

Academy of Model Aeronautics (AMA)

modelaircraft.org

Airborne Public Safety Association (APSA)

publicsafetyaviation.org

The National Association for Amateur Radio (ARRL)

arrl.org

American Society for Testing and Materials (ASTM)

astm.org

Association for Uncrewed Vehicle Systems International (AUVSI)

auvsi.org

Civil Air Patrol (CAP)

gocivilairpatrol.com

Commercial Drone Alliance (CDA)

commercialdronealliance.org

Energy Drone and Robotics Coalition (EDR Coalition)

edrcoalition.com

Federal Aviation Administration (FAA)

faa.gov/uas

First-Person View Freedom Coalition (FPVFC)

fpvfc.org

Flite Test Community Association (FTCA)

ftca.flitetest.com

Mississippi Association for Spatial Technologies (MAST)

mastgis.org

Radio Technical Commission for Aeronautics (RTCA)

rtca.org

SkillsUSA
skillsusa.org

STEM+C Creative Aeronautics (STEM+C)
stemplusc.org

Technology Student Association (TSA)
tsaweb.org

Unmanned Safety Institute (USI)
flyusi.org

Women and Drones
womenanddrones.com

Women in Aviation International (WAI)
wai.org

Using This Document

Competencies and Suggested Objectives

A competency represents a general concept or performance that students are expected to master as a requirement for satisfactorily completing a unit. Students will be expected to receive instruction on all competencies. The suggested objectives represent the enabling and supporting knowledge and performances that will indicate mastery of the competency at the course level.

Teacher Resources

All teachers should request to be added to the Canvas Resource Guide for their course. For questions or to be added to the guide, send a Help Desk ticket to the RCU by emailing helpdesk@rcu.msstate.edu.

Perkins V Quality Indicators and Enrichment Material

Some of the units may include an enrichment section at the end. This material will greatly enhance the learning experiences of students. If the Introduction to Drone Technology program uses a national certification, work-based learning, or another measure of accountability that aligns with Perkins V as a quality indicator, this material could very well be assessed on that quality indicator. It is the responsibility of the teacher to ensure all competencies for the selected quality indicator are covered throughout the year.

Unit 1: Drone Technology Safety Regulations and Operational Policies

Competencies and Suggested Objectives

1. Define terms associated with Unmanned Aircraft Systems (UAS) and operation. ^{DOK1}
 - a. Advisory circulars (AC)
 - b. Aeronautical
 - c. Aircraft
 - d. Airspace
 - e. Airspace restrictions
 - f. Applicable AC and regulations related to commercial use (i.e., 14 CFR § 107 and 135, or current law)
 - g. Applicable AC and regulations related to recreational use (i.e., 14 CFR § 48, or current law)
 - h. Aviation
 - i. Civil twilight
 - j. Drone
 - k. FAA Part 107 (14 CFR § 107)
 - l. FAR (Federal Aviation Regulations)
 - m. Federal Aviation Administration (FAA)
 - n. Fixed-wing aircraft
 - o. Hover
 - p. Manned aircraft
 - q. Multirotor aircraft
 - r. National Airspace System (NAS)
 - s. Restricted airspace
 - t. Rotary-wing aircraft
 - u. Small unmanned aircraft systems (sUAS)
 - v. UAS
 - w. Unmanned aerial vehicle (UAV)
 - x. Unmanned aircraft
 - y. Waiver
2. Explain the concept of airspace and how it defines where a UAS can be flown. ^{DOK3}
 - a. Identify altitude, speed, and weather restrictions as described in the FAA Part 107 guidelines.
 - b. Identify and describe the types of airspace where UAS operation is prohibited without proper waivers or approvals in place.
 - c. Class A, B, C, D, or E airspace
 - d. Within restricted airspace
 - e. Temporary flight restrictions (TFRs) (i.e., sporting events, etc.)
 - f. Restricted and prohibited areas
 - g. Other areas by Notice to Air Missions (NOTAM)
 - h. Investigate a UAS flight plan using the appropriate airspace application or other current applications that include Low Altitude Authorization and Notification Capability (LAANC) authorization available online or via mobile electronic device.

3. Develop and maintain an official flight log to record hours of flight and simulation experience. ^{DOK3}
4. Complete any necessary steps required by the FAA or other organizations to become eligible to fly a UAS recreationally (i.e., The Recreational UAS Safety Test [TRUST] or other current requirements). ^{DOK4}
5. Demonstrate an understanding of safety guidelines and operational rules related to unmanned aircraft system (UAS) operation and use. ^{DOK3} <ol style="list-style-type: none"> a. Using Federal Aviation Administration (FAA) guidelines, define the types of UAS aircraft (i.e., governmental, civil operations, model aircraft, etc.). b. Explain safety guidelines regarding the operation and use for each type of drone. c. Describe basic safety regarding the use of batteries in a UAS. d. Describe the effects of weather conditions for safe UAS operation. e. Discuss the risks of flying a UAS. f. Relate ethical flight operations to safely operating a UAS
6. Describe community standards for recreational and hobby aircraft used in education as set by the Academy of Model Aeronautics (AMA). ^{DOK1} <ol style="list-style-type: none"> a. Explain why there are community standards. b. Compare the differences between a community standard and a regulation or law. c. Review the AMA guidelines for operating model aircraft and complete the AMA sUAS Information and Safety course.

Note: Safety is to be taught as an ongoing part of the program. Students are required to complete a written safety test with 100% accuracy before entering the shop for lab simulations and projects. This test should be documented in each student's file.

Unit 2: Drone Flight Simulation

Competencies and Suggested Objectives
1. Demonstrate proficiency in operating equipment used in UAS flight. ^{DOK3} a. Define and discuss terms associated with flight simulation. <ul style="list-style-type: none">• Radio transmitter/controller• Toggle switches• Trim buttons• Variable sliders• Display/camera views• Environmental conditions• Aircraft selection
2. Describe the functions of aircraft control surfaces and how they are used to fly. ^{DOK4} a. Identify the throttle, rudder, elevator, aileron, flaps, and any combination of those surfaces and their respective functions in flight.
3. Recall safety guidelines for the operation of the various types of UAS. ^{DOK1} a. Differentiate between the consequences of unsafe actions in simulation flight versus actions in real flight.
4. Demonstrate safe, consistent multirotor flight through a simulation practical test. ^{DOK2} a. Takeoff and hover for a set period of time in a fixed area and land. b. Land on a designated target. c. Fly a straight line to and from a destination in a tail-in orientation. d. Fly a straight line to a destination in a tail-in orientation and return in a nose-in orientation. e. Fly left and right box patterns. f. Fly a figure-eight pattern in both a nose-in and nose-out orientation. g. Emergency recovery procedures and maneuvers.

Unit 3: Multirotor Flight

Competencies and Suggested Objectives

1. Identify and describe parts of a multirotor drone and discuss how each part interacts. ^{DOK4}
 - a. Explain and describe the following parts for identification and preflight check purposes:
 - Aircraft orientation markers
 - Battery system
 - Charging system
 - Chassis/frame
 - Electronic Speed Controller (ESC)
 - Flight controller
 - Global Positioning System (GPS)
 - Landing gear
 - Motors
 - Propeller
 - Receiver
 - Telemetry
 - b. Discuss the function of each part and how it affects the multirotor drone in various ways.
2. Demonstrate manual indoor entry-level multirotor flight practice. ^{DOK3}
 - a. Take off and hover for a set period of time in a fixed area and land.
 - b. Land on a designated target.
 - c. Fly a straight line to and from a destination in a tail-in orientation.
 - d. Fly a straight line to a destination in a tail-in orientation and return in a nose-in orientation.
 - e. Fly left and right box patterns.
 - f. Fly a figure-eight pattern in both a nose-in and nose-out orientation.
3. Conduct basic flight patterns with an outdoor capable multirotor. ^{DOK3}

Enrichment

1. Discuss basic autonomous UAV and autonomous UAS missions.
 - a. Discuss the basic use of beginner-level fully autonomous UAVs (e.g., DJI, Autel, etc.) and the importance of knowing how to fly the drone manually in case of a malfunction.
 - b. Explain the return to home (RTH) function.

Note: Reinforced throughout any unit requiring students to fly is test material directly relating to the *Unmanned Aircraft General (UAG)—Small* test, which requires a passing score to be compliant with the Federal Aviation Administration (FAA) Part 107 Remote Pilot Certification regulations.

Unit 4: FAA Part 107

Competencies and Suggested Objectives

1. Discuss the purpose of Federal Aviation Administration (FAA) Part 107. ^{DOK1}
 - a. Describe the responsibilities of a Remote Pilot in Command (RPIC).
 - b. Explain why the FAA is the airspace authority for Part 107.
2. Explain the operating rules for small unmanned aircraft systems (sUAS). ^{DOK3}
 - a. Define terms associated with the operation of sUAS.
 - Air traffic
 - Air traffic control
 - Airport authority
 - Airport control tower
 - Airspace
 - Carriage
 - Categories 1 - 4
 - Chartered club (i.e., Academy of Model Aeronautics [AMA], etc.)
 - Civil aircraft
 - Class A airspace
 - Class B airspace
 - Class C airspace
 - Class D airspace
 - Class E airspace
 - Class G airspace
 - Commercial aircraft
 - FAA–Recognized Identification Areas (FRIAs)
 - Hazardous material
 - Knots
 - Nautical mile
 - Nighttime flight
 - Preflight inspection
 - Prohibitions
 - Radio frequency line of sight
 - Remote identification
 - Visual Line Of Sight (VLOS)
 - b. Describe the operating limits for sUAS (e.g., less than 400 ft, 87 knots/100 mph).
 - c. List and discuss the prohibitions for operating sUAS.
 - Operation from a moving vehicle or aircraft
 - Alcohol or drugs
 - Beyond Visual Line-Of-Sight (BVLOS)
 - Multiple sUAS
 - Carriage of hazardous material
 - Operation near aircraft and over human beings
 - Less than 55 lbs.

<ul style="list-style-type: none"> d. Discuss the rules for operating unmanned aircraft in the vicinity of an airport. <ul style="list-style-type: none"> • Prohibited from flying in Class B, C, D, or E airspace without flight authorization (i.e., Low Altitude Authorization and Notification Capability [LAANC], etc.). • Advisement of an airport authority or air traffic control tower of intent to operate. • Not operating in any manner that is hazardous to air traffic at any airport. e. Explain the importance of a preflight inspection prior to operating an unmanned aircraft. f. Describe weather and cloud clearance requirements for flight. g. Describe any other hazardous operations as they apply to UAS flights. h. Explain the need for sUAS remote pilot certification. <ul style="list-style-type: none"> • Who should obtain an FAA Part 107 Remote Pilot Certificate? • Responsibilities of a certified FAA Part 107 remote pilot.
<p>3. Investigate and apply the concepts found within each Federal Aviation Administration (FAA) Part 107 category. ^{DOK4}</p> <ul style="list-style-type: none"> a. Identify and analyze FAA regulations and procedures for small, unmanned aircraft system (sUAS) operations (i.e., limitations, registration, remote pilot certificate sUAS-rating privileges, waiver requirements, etc.) b. Classify and differentiate among categories, classes, and types of airspace in the National Airspace System (NAS). c. Demonstrate knowledge and best practices of navigation. <ul style="list-style-type: none"> • Calculate and connect the concepts of distance, speed, and headings. • Differentiate among and analyze critical elements of charts and maps. d. Investigate and explain the need for airport and off-airport operations and communication protocols. e. Discuss the importance of concepts related to aeronautical decision making and judgment (i.e., problem solving, risk management, and situational awareness, etc.). f. Recognize and apply best practices regarding crew resource management and radio communication procedures. g. Discuss and analyze various weather conditions that affect sUAS operations. <ul style="list-style-type: none"> • General weather theory (i.e., temperature, precipitation, visibility, cloud types, and wind conditions, etc.) • Identify aviation weather information sources (i.e., Automated Weather Observing Systems (AWOS), Automated Surface Observing Systems (ASOS), etc.). • Discuss the effects that weather can have on small, unmanned aircraft performance. h. Make observations regarding aircraft performance. i. Describe and demonstrate best practices regarding emergency procedures. j. Identify and evaluate an understanding of human factors as they relate to sUAS. (i.e., fatigue, stress, and workload). k. Demonstrate and apply maintenance and preflight inspection procedures.
<p>4. Demonstrate proficiency in evaluating the airspace of the practice area. ^{DOK3}</p> <ul style="list-style-type: none"> a. Identify a local airspace's features and its proximity to airports or heliports using the appropriate application or tool (i.e., FAA's B4UFLy application, etc.). b. Contact required outside agencies prior to flight (i.e., airport operator, control tower, etc.).

5. Demonstrate compliance and understanding of FAA flight regulations. ^{DOK3}
 - a. During flight, demonstrate appropriate safety measures.
 - b. In preparing for flight, demonstrate proper preflight procedures.
 - c. Demonstrate an understanding of emergency procedures during flight.
 - d. Explain drug and alcohol restrictions for a pilot and flight crew.
 - e. Review restrictions on hazardous operation and operation of unmanned aircraft systems (UAS) from a moving vehicle.
 - f. Review line-of-site requirements.

Note: It is the responsibility of the teacher and student to ensure all competencies of the most current FAA Part 107 Remote Pilot Certification test are covered and mastered before taking the assessment. The FAA Part 107 material listed throughout this curriculum, specifically in this unit, is not completely exhaustive.

Note: Reinforced throughout any unit requiring students to fly is test material directly relating to the *Unmanned Aircraft General (UAG)—Small* test, which requires a passing score to be compliant with the Federal Aviation Administration (FAA) Part 107 Remote Pilot Certification regulations.

Student Competency Profile

Student's Name: _____

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student, and it can serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Drone Technology Safety Regulations and Operational Policies	
	1. Define terms associated with Unmanned Aircraft Systems (UAS) and operation.
	2. Explain the concept of airspace and how it defines where a UAS can be flown.
	3. Develop and maintain an official flight log to record hours of flight and simulation experience.
	4. Complete any necessary steps required by the FAA or other organizations to become eligible to fly a UAS recreationally (i.e., The Recreational UAS Safety Test [TRUST] or other current requirements).
	5. Demonstrate an understanding of safety guidelines and operational rules related to unmanned aircraft system (UAS) operation and use.
	6. Describe community standards for recreational and hobby aircraft used in education as set by the Academy of Model Aeronautics (AMA).
Unit 2: UAS Flight Simulation	
	1. Demonstrate proficiency in operating equipment used in UAS flight.
	2. Describe the functions of aircraft control and how they are used to fly.
	3. Recall safety guidelines for the operation of the various types of UAS.
	4. Demonstrate safe, consistent flight in a quadcopter through a simulation practical test.
Unit 3: Multirotor Flight	
	1. Identify and describe parts of a multirotor drone and discuss how each part interacts.
	2. Demonstrate manual indoor entry-level multirotor flight practice.
	3. Conduct basic flight patterns with an outdoor capable multirotor.
Unit 4: FAA Part 107	
	1. Discuss the purpose of Federal Aviation Administration (FAA) Part 107.
	2. Explain the operating rules for small unmanned aircraft systems (sUAS).
	3. Investigate and apply the concepts found within each Federal Aviation Administration (FAA) Part 107 category.
	4. Demonstrate proficiency in evaluating the airspace of the practice area.
	5. Demonstrate compliance and understanding of FAA flight regulations.

Appendix A: College and Career Ready Standards – Mathematics

	Units	1	2	3	4
Standards					
8.EE.1		X			
8.EE.2		X			
8.EE.3				X	
8.EE.4				X	
8.EE.5					X
8.EE.6					X
8.F.1		X			
8.F.2				X	
8.G.1			X		
8.G.2			X		
8.SP.1			X		
8.SP.2					X

2016 Mississippi College- and Career- Readiness Standards for Mathematics: Grade 8

EE Expressions and Equations

Work with radicals and integer exponents.

1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
 2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
 3. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger.
 4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notations that have been generated by technology.
- Understand the connections between proportional relationships, lines, and linear equations.
5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
 6. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .

F Functions

Define, evaluate, and compare functions.

1. Understand that a function is a rule that assigns exactly one output to each input. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
2. Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

G Geometry

Understand congruence and similarity using physical models, transparencies, or geometry software.

1. Verify experimentally the properties of rotations, reflections, and translations
 - a. Lines are taken to lines, and line segments to line segments of the same length.
 - b. Angles are taken to angles of the same measure.
 - c. Parallel lines are taken to parallel lines.
2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

SP Statistics and Probability

Investigate patterns of association in bivariate data.

1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

Appendix B: College and Career Ready Standards – English Language Arts

	Units	1	2	3	4
Standards					
RL.8.1		X			
RL.8.3		X			
RL.8.6				X	
W.8.1				X	
W.8.2			X		
SL.8.1			X		
SL.8.3					X

2016 Mississippi College- and Career-Readiness Standards for English Language Arts: Grade 8

RL Reading Literature

Key Ideas and Details

1. Cite the textual evidence that most strongly supports an analysis of what the text says explicitly, as well as inferences drawn from the text.
3. Analyze how particular lines of dialogue or incidents in a literary text propel the action, reveal aspects of a character, or provoke a decision.

Craft and Structure

6. Analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.

W Writing

Text Types and Purposes

1. Write arguments to support claims with clear reasons and relevant evidence.
 - a. Introduce claim(s), acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
 - b. Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.
 - c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
 - d. Establish and maintain a formal style.
 - e. Provide a concluding statement or section that follows from and supports the argument presented.
2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
 - a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
 - b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

- c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
- d. Use precise language and domain-specific vocabulary to inform about or explain the topic.
- e. Establish and maintain a formal style.
- f. Provide a concluding statement or section that follows from and supports the information or explanation presented.

SL Speaking and Listening

Comprehension and Collaboration

1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
 - a. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
 - b. Follow the rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.
 - c. Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.
 - d. Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.
3. Delineate a speaker's argument and specific claims, evaluate the soundness of the reasoning and relevance and sufficiency of the evidence, and identify when irrelevant evidence is introduced.

Appendix C: FAA Part 107

	Units	1	2	3	4	
Subpart A						General
§107.1		X		X	X	Applicability.
§107.2		X		X	X	Applicability of certification procedures for products and articles.
§107.3		X	X	X	X	Definitions.
§107.5				X	X	Falsification, reproduction, or alteration.
§107.7				X	X	Inspection, testing, and demonstration of compliance.
§107.9				X	X	Accident reporting.
Subpart B						Operating Rules
§107.11				X	X	Applicability.
§107.12				X	X	Requirement for a remote pilot certificate with a small UAS rating.
§107.13		X		X	X	Registration.
§107.15		X	X	X	X	Condition for safe operation.
§107.17		X	X		X	Medical condition.
§107.19				X	X	Remote pilot in command.
§107.21				X	X	In-flight emergency.
§107.23				X	X	Hazardous operation.
§107.25					X	Operation from a moving vehicle or aircraft.
§107.27				X	X	Alcohol or drugs.
§107.29				X	X	Operation at night.
§107.31		X		X	X	Visual line of sight aircraft operation.
§107.33		X		X	X	Visual observer.
§107.35		X	X	X	X	Operation of multiple small unmanned aircraft.
§107.36				X	X	Carriage of hazardous material.
§107.37		X		X	X	Operation near aircraft; right-of-way rules.
§107.39		X		X	X	Operation over human beings.
§107.41		X		X	X	Operation in certain airspace.
§107.43		X		X	X	Operation in the vicinity of airports.
§107.45				X	X	Operation in prohibited or restricted areas.
§107.47				X	X	Flight restrictions in the proximity of certain areas designated by notice to airmen.
§107.49				X	X	Preflight familiarization, inspection, and actions for aircraft operation.
§107.51				X	X	Operating limitations for small unmanned aircraft.
Subpart C						Remote Pilot Certification
§107.52					X	ATC transponder equipment prohibition.
§107.53					X	Automatic Dependent Surveillance-Broadcast (ADS-B) Out prohibition.
§107.56					X	Applicability.
§107.57					X	Offenses involving alcohol or drugs.
§107.59					X	Refusal to submit to an alcohol test or to furnish test results.
§107.61					X	Eligibility.
§107.63					X	Issuance of a remote pilot certificate with a small UAS rating.
§107.64					X	Temporary certificate.
§107.65					X	Aeronautical knowledge recency.
§107.67					X	Knowledge tests: General procedures and passing grades.
§107.69					X	Knowledge tests: Cheating or other unauthorized conduct.
§107.71					X	Retesting after failure.
§107.73					X	Knowledge and training.
§107.74					X	Small unmanned aircraft system training.
§107.77					X	Change of name or address.
§107.79					X	Voluntary surrender of certificate.
Subpart D						Operations Over Human Beings
§107.100					X	Applicability.
§107.105					X	Limitations on operations over human beings.

§107.110				X	Cat. 1 operations.
§107.115				X	Cat. 2 operations: Operating requirements.
§107.120				X	Cat. 2 operations: Eligibility of small unmanned aircraft and other applicant requirements.
§107.125				X	Cat. 3 operations: Operating requirements.
§107.130				X	Cat. 3 operations: Eligibility of small unmanned aircraft and other applicant requirements.
§107.135				X	Labeling by remote pilot in command for Category 2 and 3 operations.
§107.140				X	Category 4 operations.
§107.145				X	Operations over moving vehicles.
§107.150				X	Variable mode and variable configuration of small unmanned aircraft systems.
§107.155				X	Means of compliance.
§107.160				X	Declaration of compliance.
§107.165				X	Record retention.
Subpart E					Waivers
§107.200				X	Waiver policy and requirements.
§107.205				X	List of regulations subject to waiver.

Part 107 - Small Unmanned Aircraft Systems

Code of Federal Regulations (CFR) - Title 14 (Aeronautics and Space), Chapter I (Federal Aviation Administration, Department of Transportation), Subchapter F (Air Traffic and General Operating Rules)

Authority: [49 U.S.C. 106f.](#), [40101 note](#), [40103b.](#), [44701a.5.](#), [46105\(c\)](#), [46110](#), [44807](#).

Source: Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, unless otherwise noted.

[Subpart A—General](#)

[§ 107.1 Applicability.](#)

- a. Except as provided in [paragraph b.](#) of this section, this part applies to the registration, airman certification, and operation of civil small unmanned aircraft systems within the United States. This part also applies to the eligibility of civil small unmanned aircraft systems to operate over human beings in the United States.
- b. This part does not apply to the following:
 1. Air carrier operations;
 2. Any aircraft subject to the provisions of [49 U.S.C. 44809](#);
 3. Any operation that the holder of an exemption under section 333 of [Public Law 112–95](#) or [49 U.S.C. 44807](#) elects to conduct pursuant to the exemption, unless otherwise specified in the exemption; or
 4. Any operation that a person elects to conduct under [part 91 of this chapter](#) with a small unmanned aircraft system that has been issued an airworthiness certificate. [Amdt. No. 107–8, [86 FR 4381](#), Jan. 15, 2021]

[§ 107.2 Applicability of certification procedures for products and articles.](#)

1. The provisions of [part 21 of this chapter](#) do not apply to small unmanned aircraft systems operated under this part unless the small unmanned aircraft system will operate over human beings in accordance with [§ 107.140](#).
2. [Amdt. No. 107–8, [86 FR 4381](#), Jan. 15, 2021]

[§ 107.3 Definitions.](#)

1. The following definitions apply to this part. If there is a conflict between the definitions of this part and definitions specified in [§ 1.1 of this chapter](#), the definitions in this part control for purposes of this part:
2. *Control station* means an interface used by the remote pilot to control the flight path of the small unmanned aircraft.
3. *Corrective lenses* mean spectacles or contact lenses.
4. *Declaration of compliance* means a record submitted to the FAA that certifies the small unmanned aircraft conforms to the Category 2 or Category 3 requirements under [subpart D of this part](#).
5. *Small unmanned aircraft* means an unmanned aircraft weighing less than 55 pounds on takeoff, including everything that is on board or otherwise attached to the aircraft.
6. *Small unmanned aircraft system (small UAS)* means a small unmanned aircraft and its associated elements (including communication links and the components that control the small unmanned aircraft) that are required for the safe and efficient operation of the small unmanned aircraft in the national airspace system.
7. *Unmanned aircraft* means an aircraft operated without the possibility of direct human intervention from within or on the aircraft.
8. *Visual observer* means a person who is designated by the remote pilot in command to assist the remote pilot in command and the person manipulating the flight controls of the small UAS to see and avoid other air traffic or objects aloft or on the ground. [Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4381](#), Jan. 15, 2021]

[§ 107.5 Falsification, reproduction, or alteration.](#)

- a. No person may make or cause to be made—
 1. Any fraudulent or intentionally false record or report that is required to be made, kept, or used to show compliance with any requirement under this part.
 2. Any reproduction or alteration, for fraudulent purpose, of any certificate, rating, authorization, record, or report under this part.
- b. The commission by any person of an act prohibited under [paragraph a.](#) of this section is a basis for any of the following:
 1. Denial of an application for a remote pilot certificate or a certificate of waiver;
 2. Denial of a declaration of compliance;
 3. Suspension or revocation of any certificate, waiver, or declaration of compliance issued or accepted by the Administrator under this part and held by that person, or
 4. A civil penalty. [Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4381](#), Jan. 15, 2021]

[§ 107.7 Inspection, testing, and demonstration of compliance.](#)

- a. A remote pilot in command, owner, or person manipulating the flight controls of a small unmanned aircraft system must—
 1. Have in that person's physical possession and readily accessible the remote pilot certificate with a small UAS rating and identification when exercising the privileges of that remote pilot certificate.

2. Present his or her remote pilot certificate with a small UAS rating and identification that contains the information listed at [§ 107.67b.1.](#) through [3.](#) for inspection upon a request from—
 - i. The Administrator;
 - ii. An authorized representative of the National Transportation Safety Board;
 - iii. Any Federal, State, or local law enforcement officer, or
 - iv. An authorized representative of the Transportation Security Administration.
3. Make available, upon request, to the Administrator any document, record, or report required to be kept under the regulations of this chapter.
- b. The remote pilot in command, visual observer, owner, operator, or person manipulating the flight controls of a small unmanned aircraft system must, upon request, allow the Administrator to make any test or inspection of the small unmanned aircraft system, the remote pilot in command, the person manipulating the flight controls of a small unmanned aircraft system, and, if applicable, the visual observer to determine compliance with this part.
- c. Any person holding an FAA-accepted declaration of compliance under [subpart D of this part](#) must, upon request, make available to the Administrator:
 1. The declaration of compliance required under [subpart D of this part](#); and
 2. Any other document, record, or report required to be kept under the regulations of this chapter.
- d. Any person holding an FAA-accepted declaration of compliance under [subpart D of this part](#) must, upon request, allow the Administrator to inspect its facilities, technical data, and any manufactured small UAS and witness any tests necessary to determine compliance with that subpart. [Amdt. No. 107–8, [86 FR 4381](#), Jan. 15, 2021]

[§ 107.9 Safety event reporting.](#)

No later than ten calendar days after an operation that meets the criteria of either [paragraph a.](#) or [b.](#) of this section, a remote pilot in command must report to the FAA, in a manner acceptable to the Administrator, any operation of the small unmanned aircraft involving at least:

- a. Serious injury to any person or any loss of consciousness, or
- b. Damage to any property, other than the small unmanned aircraft, unless one of the following conditions is satisfied:
 1. The cost of repair (including materials and labor) does not exceed \$500, or
 2. The fair market value of the property does not exceed \$500 in the event of total loss.

[Subpart B—Operating Rules](#)

[§ 107.11 Applicability.](#)

This subpart applies to the operation of all civil small unmanned aircraft systems subject to this part.

[§ 107.12 Requirement for a remote pilot certificate with a small UAS rating.](#)

- a. Except as provided in [paragraph c.](#) of this section, no person may manipulate the flight controls of a small unmanned aircraft system unless:

1. That person has a remote pilot certificate with a small UAS rating issued pursuant to [subpart C of this part](#) and satisfies the requirements of [§ 107.65](#); or
 2. That person is under the direct supervision of a remote pilot in command, and the remote pilot in command has the ability to immediately take direct control of the flight of the small unmanned aircraft.
- b. Except as provided in [paragraph c.](#) of this section, no person may act as a remote pilot in command unless that person has a remote pilot certificate with a small UAS rating issued pursuant to [Subpart C of this part](#) and satisfies the requirements of [§ 107.65](#).
 - c. The Administrator may, consistent with international standards, authorize an airman to operate a civil foreign-registered small unmanned aircraft without an FAA-issued remote pilot certificate with a small UAS rating.

[§ 107.13 Registration.](#)

A person operating a civil small unmanned aircraft system for purposes of flight must comply with the provisions of [§ 91.203a.2. of this chapter](#).

[§ 107.15 Condition for safe operation.](#)

- a. No person may operate a civil small unmanned aircraft system unless it is in a condition for safe operation. Prior to each flight, the remote pilot in command must check the small unmanned aircraft system to determine whether it is in a condition for safe operation.
- b. No person may continue flight of the small unmanned aircraft when he or she knows or has reason to know that the small unmanned aircraft system is no longer in a condition for safe operation.

[§ 107.17 Medical condition.](#)

No person may manipulate the flight controls of a small unmanned aircraft system or act as a remote pilot in command, visual observer, or direct participant in the operation of the small unmanned aircraft if he or she knows or has reason to know that he or she has a physical or mental condition that would interfere with the safe operation of the small unmanned aircraft system.

[§ 107.19 Remote pilot in command.](#)

- a. A remote pilot in command must be designated before or during the flight of the small unmanned aircraft.
 - b. The remote pilot in command is directly responsible for and is the final authority as to the operation of the small unmanned aircraft system.
 - c. The remote pilot in command must ensure that the small unmanned aircraft will pose no undue hazard to other people, other aircraft, or other property in the event of a loss of control of the small unmanned aircraft for any reason.
 - d. The remote pilot in command must ensure that the small UAS operation complies with all applicable regulations of this chapter.
 - e. The remote pilot in command must have the ability to direct the small unmanned aircraft to ensure compliance with the applicable provisions of this chapter.
- [Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]

[§ 107.21 In-flight emergency.](#)

- a. In an in-flight emergency requiring immediate action, the remote pilot in command may deviate from any rule of this part to the extent necessary to meet that emergency.
- b. Each remote pilot in command who deviates from a rule under [paragraph a.](#) of this section must, upon request of the Administrator, send a written report of that deviation to the Administrator.

[§ 107.23 Hazardous operation.](#)

No person may:

- a. Operate a small unmanned aircraft system in a careless or reckless manner so as to endanger the life or property of another, or
- b. Allow an object to be dropped from a small unmanned aircraft in a manner that creates an undue hazard to persons or property.

[§ 107.25 Operation from a moving vehicle or aircraft.](#)

No person may operate a small unmanned aircraft system—

- a. From a moving aircraft; or
- b. From a moving land or water-borne vehicle unless the small unmanned aircraft is flown over a sparsely populated area and is not transporting another person's property for compensation or hire.

[§ 107.27 Alcohol or drugs.](#)

A person manipulating the flight controls of a small unmanned aircraft system or acting as a remote pilot in command or visual observer must comply with the provisions of [§§ 91.17 and 91.19 of this chapter.](#)

[§ 107.29 Operation at night.](#)

- a. Except as provided in [paragraph d.](#) of this section, no person may operate a small unmanned aircraft system at night unless—
 1. The remote pilot in command of the small unmanned aircraft has completed an initial knowledge test or training, as applicable, under [§ 107.65](#) after April 6, 2021, and
 2. The small unmanned aircraft has anti-collision lighting visible for at least three statute miles that has a flash rate sufficient to avoid a collision. The remote pilot in command may reduce the intensity of, but may not extinguish, the anti-collision lighting if he or she determines that, because of operating conditions, it would be in the interest of safety to do so.
- b. No person may operate a small unmanned aircraft system during periods of civil twilight unless the small unmanned aircraft has lighted anti-collision lighting visible for at least three statute miles that has a flash rate sufficient to avoid a collision. The remote pilot in command may reduce the intensity of, but may not extinguish, the anti-collision lighting if he or she determines that, because of operating conditions, it would be in the interest of safety to do so.
- c. For purposes of [paragraph b.](#) of this section, civil twilight refers to the following:
 1. Except for Alaska, a period of time that begins 30 minutes before official sunrise and ends at official sunrise;
 2. Except for Alaska, a period of time that begins at official sunset and ends 30 minutes after official sunset, and
 3. In Alaska, the period of civil twilight as defined in the Air Almanac.

- d. After May 17, 2021, no person may operate a small unmanned aircraft system at night in accordance with a certificate of waiver issued prior to April 21, 2021, under [§ 107.200](#). The certificates of waiver issued prior to March 16, 2021, under [§ 107.200](#) that authorize deviation from [§ 107.29](#) terminate on May 17, 2021.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021; [86 FR 13631](#), Mar. 10, 2020]

[§ 107.31 Visual line of sight aircraft operation.](#)

- a. With vision that is unaided by any device other than corrective lenses, the remote pilot in command, the visual observer (if one is used), and the person manipulating the flight control of the small unmanned aircraft system must be able to see the unmanned aircraft throughout the entire flight in order to:
 - 1. Know the unmanned aircraft's location;
 - 2. Determine the unmanned aircraft's attitude, altitude, and direction of flight;
 - 3. Observe the airspace for other air traffic or hazards; and
 - 4. Determine that the unmanned aircraft does not endanger the life or property of another.
- b. Throughout the entire flight of the small unmanned aircraft, the ability described in [paragraph a.](#) of this section must be exercised by either:
 - 1. The remote pilot in command and the person manipulating the flight controls of the small unmanned aircraft system, or
 - 2. A visual observer.

[§ 107.33 Visual observer.](#)

If a visual observer is used during the aircraft operation, all of the following requirements must be met:

- a. The remote pilot in command, the person manipulating the flight controls of the small unmanned aircraft system, and the visual observer must maintain effective communication with each other at all times.
- b. The remote pilot in command must ensure that the visual observer is able to see the unmanned aircraft in the manner specified in [§ 107.31](#).
- c. The remote pilot in command, the person manipulating the flight controls of the small unmanned aircraft system, and the visual observer must coordinate to do the following:
 - 1. Scan the airspace where the small unmanned aircraft is operating for any potential collision hazard, and
 - 2. Maintain awareness of the position of the small unmanned aircraft through direct visual observation.

[§ 107.35 Operation of multiple small unmanned aircraft.](#)

A person may not manipulate flight controls or act as a remote pilot in command or visual observer in the operation of more than one unmanned aircraft at the same time.

[Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]

[§ 107.36 Carriage of hazardous material.](#)

A small unmanned aircraft may not carry hazardous material. For purposes of this section, the term hazardous material is defined in [49 CFR 171.8](#).

[§ 107.37 Operation near aircraft; right-of-way rules.](#)

- a. Each small unmanned aircraft must yield the right of way to all aircraft, airborne vehicles, and launch and reentry vehicles. Yielding the right of way means that

the small unmanned aircraft must give way to the aircraft or vehicle and may not pass over, under, or ahead of it unless well clear.

- b. No person may operate a small unmanned aircraft so close to another aircraft as to create a collision hazard.

[§ 107.39 Operation over human beings.](#)

No person may operate a small unmanned aircraft over a human being unless—

- a. That human being is directly participating in the operation of the small unmanned aircraft;
- b. That human being is located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling small unmanned aircraft, or
- c. The operation meets the requirements of at least one of the operational categories specified in [subpart D of this part.](#)

[Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]

[§ 107.41 Operation in certain airspace.](#)

No person may operate a small unmanned aircraft in Class B, Class C, or Class D airspace or within the lateral boundaries of the surface area of Class E airspace designated for an airport unless that person has prior authorization from Air Traffic Control (ATC).

[§ 107.43 Operation in the vicinity of airports.](#)

No person may operate a small unmanned aircraft in a manner that interferes with operations and traffic patterns at any airport, heliport, or seaplane base.

[§ 107.45 Operation in prohibited or restricted areas.](#)

No person may operate a small unmanned aircraft in prohibited or restricted areas unless that person has permission from the using or controlling agency, as appropriate.

[§ 107.47 Flight restrictions in the proximity of certain areas designated by notice to airmen.](#)

A person acting as a remote pilot in command must comply with the provisions of [§§ 91.137](#) through [91.145](#) and [99.7 of this chapter.](#)

[§ 107.49 Preflight familiarization, inspection, and actions for aircraft operation.](#)

Prior to flight, the remote pilot in command must:

- a. Assess the operating environment, considering risks to persons and property in the immediate vicinity both on the surface and in the air. This assessment must include:
 1. Local weather conditions;
 2. Local airspace and any flight restrictions;
 3. The location of persons and property on the surface; and
 4. Other ground hazards.
- b. Ensure that all persons directly participating in the small unmanned aircraft operation are informed about the operating conditions, emergency procedures, contingency procedures, roles and responsibilities, and potential hazards;
- c. Ensure that all control links between ground control station and the small unmanned aircraft are working properly;
- d. If the small unmanned aircraft is powered, ensure that there is enough available power for the small unmanned aircraft system to operate for the intended operational time;

- e. Ensure that any object attached or carried by the small unmanned aircraft is secure and does not adversely affect the flight characteristics or controllability of the aircraft, and
- f. If the operation will be conducted over human beings under [subpart D of this part](#), ensure that the aircraft meets the requirements of [§ 107.110](#), [§ 107.120a.](#), [§ 107.130a.](#), or [§ 107.140](#), as applicable.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]

[§ 107.51 Operating limitations for small unmanned aircraft.](#)

A remote pilot in command and the person manipulating the flight controls of the small unmanned aircraft system must comply with all of the following operating limitations when operating a small unmanned aircraft system:

- a. The groundspeed of the small unmanned aircraft may not exceed 87 knots (100 miles per hour).
- b. The altitude of the small unmanned aircraft cannot be higher than 400 feet above ground level, unless the small unmanned aircraft:
 - 1. Is flown within a 400-foot radius of a structure, and
 - 2. Does not fly higher than 400 feet above the structure's immediate uppermost limit.
- c. The minimum flight visibility, as observed from the location of the control station, must be no less than three statute miles. For purposes of this section, flight visibility means the average slant distance from the control station at which prominent unlighted objects may be seen and identified by day, and prominent lighted objects may be seen and identified by night.
- d. The minimum distance of the small unmanned aircraft from clouds must be no less than:
 - 1. 500 feet below the cloud; and
 - 2. 2,000 feet horizontally from the cloud.

[Subpart C—Remote Pilot Certification](#)

[§ 107.52 ATC transponder equipment prohibition.](#)

Unless otherwise authorized by the Administrator, no person may operate a small unmanned aircraft system under this part with a transponder on.

[Amdt. No. 107–7, [86 FR 4513](#), Jan. 15, 2021]

[§ 107.53 Automatic Dependent Surveillance-Broadcast \(ADS-B\) Out prohibition.](#)

Unless otherwise authorized by the Administrator, no person may operate a small unmanned aircraft system under this part with ADS-B Out equipment in transmit mode.

[Amdt. No. 107–7, [86 FR 4513](#), Jan. 15, 2021]

[§ 107.56 Applicability.](#)

This subpart prescribes the requirements for issuing a remote pilot certificate with a small UAS rating.

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016. Redesignated by Amdt. No. 107–7, [86 FR 4513](#), Jan. 15, 2021]

[§ 107.57 Offenses involving alcohol or drugs.](#)

- a. A conviction for the violation of any Federal or State statute relating to the growing, processing, manufacture, sale, disposition, possession, transportation, or

importation of narcotic drugs, marijuana, or depressant or stimulant drugs or substances is grounds for:

1. Denial of an application for a remote pilot certificate with a small UAS rating for a period of up to 1 year after the date of final conviction, or
 2. Suspension or revocation of a remote pilot certificate with a small UAS rating.
- b. Committing an act prohibited by [§ 91.17a.](#) or [§ 91.19a. of this chapter](#) is grounds for:
1. Denial of an application for a remote pilot certificate with a small UAS rating for a period of up to 1 year after the date of that act, or
 2. Suspension or revocation of a remote pilot certificate with a small UAS rating.

[§ 107.59 Refusal to submit to an alcohol test or to furnish test results.](#)

A refusal to submit to a test to indicate the percentage by weight of alcohol in the blood, when requested by a law enforcement officer in accordance with [§ 91.17c. of this chapter](#), or a refusal to furnish or authorize the release of the test results requested by the Administrator in accordance with [§ 91.17c.](#) or [d. of this chapter](#), is grounds for:

- a. Denial of an application for a remote pilot certificate with a small UAS rating for a period of up to 1 year after the date of that refusal, or
- b. Suspension or revocation of a remote pilot certificate with a small UAS rating.

[§ 107.61 Eligibility.](#)

Subject to the provisions of [§§ 107.57](#) and [107.59](#), in order to be eligible for a remote pilot certificate with a small UAS rating under this subpart, a person must:

- a. Be at least 16 years of age;
- b. Be able to read, speak, write, and understand the English language. If the applicant is unable to meet one of these requirements due to medical reasons, the FAA may place such operating limitations on that applicant's certificate as are necessary for the safe operation of the small unmanned aircraft;
- c. Not know or have reason to know that he or she has a physical or mental condition that would interfere with the safe operation of a small unmanned aircraft system, and
- d. Demonstrate aeronautical knowledge by satisfying one of the following conditions, in a manner acceptable to the Administrator:
 1. Pass an initial aeronautical knowledge test covering the areas of knowledge specified in [§ 107.73](#), or
 2. If a person holds a pilot certificate (other than a student pilot certificate) issued under [part 61 of this chapter](#) and meets the flight review requirements specified in [§ 61.56](#), complete training covering the areas of knowledge specified in [§ 107.74](#).

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]

[§ 107.63 Issuance of a remote pilot certificate with a small UAS rating.](#)

An applicant for a remote pilot certificate with a small UAS rating under this subpart must make the application in a form and manner acceptable to the Administrator.

- a. The application must include either:
 1. Evidence showing that the applicant passed an initial aeronautical knowledge test. If applying using a paper application, this evidence must be an airman knowledge test report showing passage of the knowledge test, or

2. If a person holds a pilot certificate (other than a student pilot certificate) issued under [part 61 of this chapter](#) and meets the flight review requirements specified in [§ 61.56](#), a certificate of completion of an initial training course under this part that covers the areas of knowledge specified in [§ 107.74](#).
- b. If the application is being made pursuant to [paragraph a.2.](#) of this section:
 1. The application must be submitted to the responsible Flight Standards office, a designated pilot examiner, an airman certification representative for a pilot school, a certificated flight instructor, or other person authorized by the Administrator;
 2. The person accepting the application submission must verify the identity of the applicant in a manner acceptable to the Administrator, and
 3. The person making the application must, by logbook endorsement or other manner acceptable to the Administrator, show the applicant meets the flight review requirements specified in [§ 61.56 of this chapter](#).

[Docket FAA–2015–0150, Amdt. 107–1, [81 FR 42209](#), June 28, 2016, as amended by Docket FAA–2018–0119, Amdt. 107–2, [83 FR 9172](#), Mar. 5, 2018; Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021]]

[§ 107.64 Temporary certificate.](#)

- a. A temporary remote pilot certificate with a small UAS rating is issued for up to 120 calendar days, at which time a permanent certificate will be issued to a person whom the Administrator finds qualified under this part.
- b. A temporary remote pilot certificate with a small UAS rating expires:
 1. On the expiration date shown on the certificate,
 2. Upon receipt of the permanent certificate, or
 3. Upon receipt of a notice that the certificate sought is denied or revoked.

[§ 107.65 Aeronautical knowledge recency.](#)

A person may not exercise the privileges of a remote pilot in command with small UAS rating unless that person has accomplished one of the following in a manner acceptable to the Administrator within the previous 24 calendar months:

- a. Passed an initial aeronautical knowledge test covering the areas of knowledge specified in [§ 107.73](#);
- b. Completed recurrent training covering the areas of knowledge specified in [§ 107.73](#); or
- c. If a person holds a pilot certificate (other than a student pilot certificate) issued under [part 61 of this chapter](#) and meets the flight review requirements specified in [§ 61.56](#), completed training covering the areas of knowledge specified in [§ 107.74](#).
- d. A person who has passed a recurrent aeronautical knowledge test in a manner acceptable to the Administrator or who has satisfied the training requirement of [paragraph c.](#) of this section prior to April 6, 2021, within the previous 24 calendar months is considered to be in compliance with the requirement of [paragraph b.](#) or [c.](#) of this section, as applicable.

[Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021; [86 FR 13631](#), Mar. 10, 2021]

[§ 107.67 Knowledge tests: General procedures and passing grades.](#)

- a. Knowledge tests prescribed by or under this part are given by persons and in the manner designated by the Administrator.
- b. An applicant for a knowledge test must have proper identification at the time of application that contains the applicant's:
 1. Photograph;
 2. Signature;
 3. Date of birth, which shows the applicant meets or will meet the age requirements of this part for the certificate and rating sought before the expiration date of the airman knowledge test report; and
 4. Permanent mailing address. If the applicant's permanent mailing address is a post office box number, then the applicant must also provide a current residential address.
- c. The minimum passing grade for the knowledge test will be specified by the Administrator.

[§ 107.69 Knowledge tests: Cheating or other unauthorized conduct.](#)

- a. An applicant for a knowledge test may not:
 1. Copy or intentionally remove any knowledge test;
 2. Give to another applicant or receive from another applicant any part or copy of a knowledge test;
 3. Give or receive assistance on a knowledge test during the period that test is being given;
 4. Take any part of a knowledge test on behalf of another person;
 5. Be represented by, or represent, another person for a knowledge test;
 6. Use any material or aid during the period that the test is being given, unless specifically authorized to do so by the Administrator; and
 7. Intentionally cause, assist, or participate in any act prohibited by this paragraph.
- b. An applicant who the Administrator finds has committed an act prohibited by [paragraph a.](#) of this section is prohibited, for one year after the date of committing that act, from:
 1. Applying for any certificate, rating, or authorization issued under this chapter; and
 2. Applying for and taking any test under this chapter.
- c. Any certificate or rating held by an applicant may be suspended or revoked if the Administrator finds that person has committed an act prohibited by [paragraph a.](#) of this section.

[§ 107.71 Retesting after failure.](#)

An applicant for a knowledge test who fails that test may not reapply for the test for 14 calendar days after failing the test.

[§ 107.73 Knowledge and training.](#)

An initial aeronautical knowledge test and recurrent training covers the following areas of knowledge:

- a. Applicable regulations relating to small unmanned aircraft system rating privileges, limitations, and flight operation;
- b. Airspace classification, operating requirements, and flight restrictions affecting small unmanned aircraft operation;

- c. Aviation weather sources and effects of weather on small unmanned aircraft performance;
- d. Small unmanned aircraft loading;
- e. Emergency procedures;
- f. Crew resource management;
- g. Radio communication procedures;
- h. Determining the performance of the small unmanned aircraft;
- i. Physiological effects of drugs and alcohol;
- j. Aeronautical decision-making and judgment;
- k. Airport operations;
- l. Maintenance and preflight inspection procedures; and
- m. Operation at night.

[Amdt. No. 107–8, [86 FR 4383](#), Jan. 15, 2021]

[§ 107.74 Small unmanned aircraft system training.](#)

Training for pilots who hold a pilot certificate (other than a student pilot certificate) issued under [part 61 of this chapter](#) and meet the flight review requirements specified in [§ 61.56](#) covers the following areas of knowledge:

- a. Applicable regulations relating to small unmanned aircraft system rating privileges, limitations, and flight operation;
- b. Effects of weather on small unmanned aircraft performance;
- c. Small unmanned aircraft loading;
- d. Emergency procedures;
- e. Crew resource management;
- f. Determining the performance of the small unmanned aircraft;
- g. Maintenance and preflight inspection procedures; and
- h. Operation at night.

[Amdt. No. 107–8, [86 FR 4383](#), Jan. 15, 2021]

[§ 107.77 Change of name or address.](#)

- a. **Change of name.** An application to change the name on a certificate issued under this subpart must be accompanied by the applicant's:
 - 1. Remote pilot certificate with small UAS rating; and
 - 2. A copy of the marriage license, court order, or other document verifying the name change.
- b. The documents in [paragraph a.](#) of this section will be returned to the applicant after inspection.
- c. **Change of address.** The holder of a remote pilot certificate with small UAS rating issued under this subpart who has made a change in permanent mailing address may not, after 30 days from that date, exercise the privileges of the certificate unless the holder has notified the FAA of the change in address using one of the following methods:
 - 1. By letter to the FAA Airman Certification Branch, P.O. Box 25082, Oklahoma City, OK 73125, providing the new permanent mailing address, or if the permanent mailing address includes a post office box number, then the holder's current residential address; or

2. By using the FAA website portal at www.faa.gov providing the new permanent mailing address, or if the permanent mailing address includes a post office box number, then the holder's current residential address.

[§ 107.79 Voluntary surrender of certificate.](#)

- a. The holder of a certificate issued under this subpart may voluntarily surrender it for cancellation.
- b. Any request made under [paragraph a.](#) of this section must include the following signed statement or its equivalent: “I voluntarily surrender my remote pilot certificate with a small UAS rating for cancellation. This request is made for my own reasons, with full knowledge that my certificate will not be reissued to me unless I again complete the requirements specified in [§§ 107.61](#) and [107.63.](#)”

[Subpart D—Operations Over Human Beings](#)

Source: Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021

[§ 107.100 Applicability.](#)

This subpart prescribes the eligibility and operating requirements for civil small unmanned aircraft to operate over human beings or over moving vehicles in the United States, in addition to those operations permitted by [§ 107.39a.](#) and [b.](#)

[§ 107.105 Limitations on operations over human beings.](#)

Except as provided in [§§ 107.39a.](#) and [b.](#) and [107.145](#), a remote pilot in command may conduct operations over human beings only in accordance with the following, as applicable: [§ 107.110](#) for Category 1 operations; [§§ 107.115](#) and [107.120](#) for Category 2 operations; [§§ 107.125](#) and [107.130](#) for Category 3 operations; or [§ 107.140](#) for Category 4 operations.

[§ 107.110 Category 1 operations.](#)

To conduct Category 1 operations—

- a. A remote pilot in command must use a small unmanned aircraft that—
 1. Weighs 0.55 pounds or less on takeoff and throughout the duration of each operation under Category 1, including everything that is on board or otherwise attached to the aircraft, and
 2. Does not contain any exposed rotating parts that would lacerate human skin upon impact with a human being.
- b. No remote pilot in command may operate a small unmanned aircraft in sustained flight over open-air assemblies of human beings unless the operation meets the requirements of either [§ 89.110](#) or [§ 89.115a. of this chapter.](#)

[Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021, as amended by [86 FR 62473](#), Nov. 10, 2021]

[§ 107.115 Category 2 operations: Operating requirements.](#)

To conduct Category 2 operations—

- a. A remote pilot in command must use a small unmanned aircraft that—
 1. Is eligible for Category 2 operations pursuant to [§ 107.120a.](#);
 2. Is listed on an FAA-accepted declaration of compliance as eligible for Category 2 operations in accordance with [§ 107.160](#), and
 3. Is labeled as eligible to conduct Category 2 operations in accordance with [§ 107.120b.1.](#)
- b. No remote pilot in command may operate a small unmanned aircraft in sustained flight over open-air assemblies of human beings unless the operation meets the requirements of either [§ 89.110](#) or [§ 89.115a. of this chapter.](#)

[§ 107.120 Category 2 operations: Eligibility of small unmanned aircraft and other applicant requirements.](#)

- a. To be eligible for use in Category 2 operations, the small unmanned aircraft must be designed, produced, or modified such that it—
 1. Will not cause injury to a human being that is equivalent to or greater than the severity of injury caused by a transfer of 11 foot-pounds of kinetic energy upon impact from a rigid object;
 2. Does not contain any exposed rotating parts that would lacerate human skin upon impact with a human being, and
 3. Does not contain any safety defects.
- b. The applicant for a declaration of compliance for a small unmanned aircraft that is eligible for use in Category 2 operations in accordance with [paragraph a.](#) of this section, must meet all of the following requirements for the applicant's unmanned aircraft to be used in Category 2 operations:
 1. Display a label on the small unmanned aircraft indicating eligibility to conduct Category 2 operations. The label must be in English and be legible, prominent, and permanently affixed to the small unmanned aircraft.
 2. Have remote pilot operating instructions that apply to the operation of the small unmanned aircraft system. The applicant for a declaration of compliance must make available these instructions upon sale or transfer of the aircraft or use of the aircraft by someone other than the applicant who submitted a declaration of compliance pursuant to [§ 107.160](#). Such instructions must address, at a minimum—
 - i. A system description that includes the required small unmanned aircraft system components, any system limitations, and the declared category or categories of operation;
 - ii. Modifications that will not change the ability of the small unmanned aircraft system to meet the requirements for the category or categories of operation the small unmanned aircraft system is eligible to conduct, and
 - iii. Instructions for how to verify and change the mode or configuration of the small unmanned aircraft system, if they are variable.
 3. Maintain a product support and notification process. The applicant for a declaration of compliance must maintain product support and notification procedures to notify the public and the FAA of—
 - i. Any defect or condition that causes the small unmanned aircraft to no longer meet the requirements of this subpart, and
 - ii. Any identified safety defect that causes the small unmanned aircraft to exceed a low probability of casualty.

[§ 107.125 Category 3 operations: Operating requirements.](#)

To conduct Category 3 operations, a remote pilot in command—

- a. Must use a small unmanned aircraft that—
 1. Is eligible for Category 3 operations pursuant to § 107.130a.;
 2. Is listed on an FAA-accepted declaration of compliance as eligible for Category 3 operations in accordance with § 107.160, and
 3. Is labeled as eligible for Category 3 operations in accordance with § 107.130b.1.;

- b. Must not operate the small unmanned aircraft over open-air assemblies of human beings, and
- c. May only operate the small unmanned aircraft above any human being if operation meets one of the following conditions:
 - 1. The operation is within or over a closed- or restricted-access site, and all human beings located within the closed- or restricted-access site must be on notice that a small unmanned aircraft may fly over them, or
 - 2. The small unmanned aircraft does not maintain sustained flight over any human being unless that human being is—
 - i. Directly participating in the operation of the small unmanned aircraft, or
 - ii. Located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling small unmanned aircraft.

[Amdt. No. 107–8, [86 FR 4382](#), Jan. 15, 2021, as amended by [86 FR 62473](#), Nov. 10, 2021]
[§ 107.130 Category 3 operations: Eligibility of small unmanned aircraft and other applicant requirements.](#)

- a. To be eligible for use in Category 3 operations, the small unmanned aircraft must be designed, produced, or modified such that it—
 - 1. Will not cause injury to a human being that is equivalent to or greater than the severity of the injury caused by a transfer of 25 foot-pounds of kinetic energy upon impact from a rigid object;
 - 2. Does not contain any exposed rotating parts that would lacerate human skin upon impact with a human being, and
 - 3. Does not contain any safety defects.
- b. The applicant for a declaration of compliance for a small unmanned aircraft that is eligible for use in Category 3 operations in accordance with [paragraph a.](#) of this section, must meet all of the following requirements for the applicant's small unmanned aircraft to be used in Category 3 operations:
 - 1. Display a label on the small unmanned aircraft indicating eligibility to conduct Category 3 operations. The label must be in English and be legible, prominent, and permanently affixed to the small unmanned aircraft.
 - 2. Have remote pilot operating instructions that apply to the operation of the small unmanned aircraft system. The applicant for a declaration of compliance must make available these instructions upon sale or transfer of the aircraft or use of the aircraft by someone other than the applicant who submitted a declaration of compliance pursuant to [§ 107.160](#). Such instructions must address, at a minimum—
 - i. A system description that includes the required small unmanned aircraft system components, any system limitations, and the declared category or categories of operation;
 - ii. Modifications that will not change the ability of the small unmanned aircraft system to meet the requirements for the category or categories of operation the small unmanned aircraft system is eligible to conduct; and
 - iii. Instructions for how to verify and change the mode or configuration of the small unmanned aircraft system, if they are variable.

3. Maintain a product support and notification process. The applicant for a declaration of compliance must maintain product support and notification procedures to notify the public and the FAA of—
 - i. Any defect or condition that causes the small unmanned aircraft to no longer meet the requirements of this subpart; and
 - ii. Any identified safety defect that causes the small unmanned aircraft to exceed a low probability of fatality.

[§ 107.135 Labeling by remote pilot in command for Category 2 and 3 operations.](#)

If a Category 2 or Category 3 label affixed to a small unmanned aircraft is damaged, destroyed, or missing, a remote pilot in command must label the aircraft in English such that the label is legible, prominent, and will remain on the small unmanned aircraft for the duration of the operation before conducting operations over human beings. The label must correctly identify the category or categories of operation over human beings that the small unmanned aircraft is qualified to conduct in accordance with this subpart.

[§ 107.140 Category 4 operations.](#)

- a. **Remote pilot in command requirements.** To conduct Category 4 operations—
 1. A remote pilot in command—
 - i. Must use a small unmanned aircraft that is eligible for Category 4 operations pursuant to [paragraph b.](#) of this section; and
 - ii. Must operate the small unmanned aircraft in accordance with all operating limitations that apply to the small unmanned aircraft, as specified by the Administrator.
 2. No remote pilot in command may operate a small unmanned aircraft in sustained flight over open-air assemblies of human beings unless the operation meets the requirements of either [§ 89.110](#) or [§ 89.115a. of this chapter.](#)
- b. **Small unmanned aircraft requirements for Category 4.** To be eligible to operate over human beings under this section, the small unmanned aircraft must—
 1. Have an airworthiness certificate issued under part 21 of this chapter.
 2. Be operated in accordance with the operating limitations specified in the approved Flight Manual or as otherwise specified by the Administrator. The operating limitations must not prohibit operations over human beings.
 3. Have maintenance, preventive maintenance, alterations, or inspections performed in accordance with [paragraph c.1.](#) of this section.
- c. **Maintenance requirements for Category 4.** The owner must (unless the owner enters into an agreement with an operator to meet the requirements of this [paragraph c.](#), then the operator must) meet the requirements of this [paragraph c.](#):
 1. Ensure the person performing any maintenance, preventive maintenance, alterations, or inspections:
 - i. Uses the methods, techniques, and practices prescribed in the manufacturer's current maintenance manual or Instructions for Continued Airworthiness that are acceptable to the Administrator, or other methods, techniques, and practices acceptable to the Administrator;
 - ii. Has the knowledge, skill, and appropriate equipment to perform the work;
 - iii. Performs the maintenance, preventive maintenance, or alterations on the small unmanned aircraft in a manner using the methods, techniques, and

- practices prescribed in the manufacturer's current maintenance manual or Instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator;
- iv. Inspect the small unmanned aircraft in accordance with the manufacturer's instructions or other instructions acceptable to the Administrator, and
 - v. Performs the maintenance, preventive maintenance, or alterations using parts of such a quality that the condition of the aircraft will be at least equal to its original or properly altered condition.
2. Maintain all records of maintenance, preventive maintenance, and alterations performed on the aircraft and ensure the records are documented in a manner acceptable to the Administrator. The records must contain the description of the work performed, the date the work was completed, and the name of the person who performed the work.
 3. Maintain all records containing—
 - i. The status of life-limited parts that are installed on, or part of, the small unmanned aircraft;
 - ii. The inspection status of the aircraft; and
 - iii. The status of applicable airworthiness directives, including the method of compliance, the airworthiness directive number, and revision date. If the airworthiness directive involves recurring action, the record must contain the time and date of the next required action.
 4. Retain the records required under [paragraphs c.2.](#) and [3.](#) of this section, as follows:
 - i. The records documenting maintenance, preventive maintenance, or alterations performed must be retained for one year from when the work is completed or until the maintenance is repeated or superseded by other work.
 - ii. The records documenting the status of life-limited parts, compliance with airworthiness directives, and inspection status of the small unmanned aircraft must be retained and transferred with the aircraft upon change in ownership.
 5. Ensure all records under [paragraphs c.2.](#) and [3.](#) of this section are available for inspection upon request from the Administrator or any authorized representative of the National Transportation Safety Board (NTSB).
 - d. **Compliance with [parts 43 and 91 of this chapter.](#)** Compliance with part 43 and part 91, subpart E, of this chapter fulfills the requirements in [paragraphs b.3.](#) and [c.](#) of this section.

[Amdt. No. 107–8, [86 FR 4383](#), Jan. 15, 2021; [86 FR 13633](#), Mar. 10, 2021]

[§ 107.145 Operations over moving vehicles.](#)

No person may operate a small unmanned aircraft over a human being located inside a moving vehicle unless the following conditions are met:

- a. The operation occurs in accordance with [§ 107.110](#) for Category 1 operations, [§ 107.115](#) for Category 2 operations, [§ 107.125](#) for Category 3 operations, or [§ 107.140](#) for Category 4 operations.

- b. For an operation under Category 1, Category 2, or Category 3, the small unmanned aircraft, throughout the operation—
 - 1. Must remain within or over a closed- or restricted-access site, and all human beings located inside a moving vehicle within the closed- or restricted-access site must be on notice that a small unmanned aircraft may fly over them, or
 - 2. Must not maintain sustained flight over moving vehicles.
- c. For a Category 4 operation, the small unmanned aircraft must—
 - 1. Have an airworthiness certificate issued under part 21 of this chapter.
 - 2. Be operated in accordance with the operating limitations specified in the approved Flight Manual or as otherwise specified by the Administrator. The operating limitations must not prohibit operations over human beings located inside moving vehicles.

[§ 107.150 Variable mode and variable configuration of small unmanned aircraft systems.](#)

A small unmanned aircraft system may be eligible for one or more categories of operation over human beings under this subpart, as long as a remote pilot in command cannot inadvertently switch between modes or configurations.

[§ 107.155 Means of compliance.](#)

- a. **Establishment of compliance.** To meet the requirements of [§ 107.120a.](#) for operations in Category 2, or the requirements of [§ 107.130a.](#) for operations in Category 3, the means of compliance must consist of test, analysis, or inspection.
- b. **Required information.** An applicant requesting FAA acceptance of a means of compliance must submit the following information to the FAA in a manner specified by the Administrator:
 - 1. Procedures. Detailed description of the means of compliance, including applicable test, analysis, or inspection procedures to demonstrate how the small unmanned aircraft meets the requirements of § 107.120a. for operations in Category 2 or the requirements of § 107.130a. for operations in Category 3. The description should include conditions, environments, and methods, as applicable.
 - 2. Compliance explanation. Explanation of how application of the means of compliance fulfills the requirements of § 107.120a. for operations in Category 2 or the requirements of [§ 107.130a.](#) for operations in Category 3.
- c. **FAA acceptance.** If the FAA determines the applicant has demonstrated compliance with [paragraphs a.](#) and [b.](#) of this section, it will notify the applicant that it has accepted the means of compliance.
- d. **Rescission.**
 - 1. A means of compliance is subject to ongoing review by the Administrator. The Administrator may rescind its acceptance of a means of compliance if the Administrator determines that a means of compliance does not meet any or all of the requirements of this subpart.
 - 2. The Administrator will publish a notice of rescission in the Federal Register.
- e. **Inapplicability of part 13, subpart D, of this chapter.** Part 13, subpart D, of this chapter, does not apply to the procedures of [paragraph a.](#) of this section.

[§ 107.160 Declaration of compliance.](#)

- a. **Required information.** In order for an applicant to declare a small unmanned aircraft is compliant with the requirements of this subpart for Category 2 or

Category 3 operations, an applicant must submit a declaration of compliance for acceptance by the FAA, in a manner specified by the Administrator, that includes the following information:

1. Applicant's name;
 2. Applicant's physical address;
 3. Applicant's email address;
 4. The small unmanned aircraft make and model name, and series, if applicable;
 5. The small unmanned aircraft serial number or range of serial numbers that are the subject of the declaration of compliance;
 6. Whether the declaration of compliance is an initial declaration or an amended declaration;
 7. If the declaration of compliance is an amended declaration, the reason for the re-submittal;
 8. The accepted means of compliance the applicant used to fulfill requirements of § 107.120a. or § 107.130a. or both;
 9. A declaration that the applicant—
 - i. Has demonstrated that the small unmanned aircraft, or specific configurations of that aircraft, satisfies [§ 107.120a.](#) or [§ 107.130a.](#) or both, through the accepted means of compliance identified in [paragraph a.8.](#) of this section;
 - ii. Has verified that the unmanned aircraft does not contain any safety defects;
 - iii. Has satisfied § 107.120b.3. or § 107.130b.3., or both; and
 - iv. Will, upon request, allow the Administrator to inspect its facilities, technical data, and any manufactured small unmanned aircraft and witness any tests necessary to determine compliance with this subpart; and
 10. Other information as required by the Administrator.
- b. FAA acceptance. If the FAA determines the applicant has demonstrated compliance with the requirements of this subpart, it will notify the applicant that it has accepted the declaration of compliance.
- c. Notification of a safety issue. Prior to initiating rescission proceedings pursuant to paragraphs d.1. through 3. of this section, the FAA will notify the applicant if a safety issue has been identified for the declaration of compliance.
- d. Rescission.
1. No person may operate a small unmanned aircraft identified on a declaration of compliance that the FAA has rescinded pursuant to this subpart while that declaration of compliance is rescinded.
 2. The FAA may rescind a declaration of compliance if any of the following conditions occur:
 - i. A small unmanned aircraft for which a declaration of compliance was accepted no longer complies with [§ 107.120a.](#) or [§ 107.130a.](#);
 - ii. The FAA finds a declaration of compliance is in violation of [§ 107.5a.](#);
 - or
 - iii. The Administrator determines an emergency exists related to safety in accordance with the authority in [49 U.S.C. 46105.](#)

3. If a safety issue identified under [paragraph c.](#) of this section has not been resolved, the FAA may rescind the declaration of compliance as follows:
 - i. The FAA will issue a notice proposing to rescind the declaration of compliance. The notice will set forth the Agency's basis for the proposed rescission and provide the holder of the declaration of compliance within 30 calendar days from the date of issuance of the proposed notice to submit evidentiary information to refute the proposed notice.
 - ii. The holder of the declaration of compliance must submit information demonstrating how the small unmanned aircraft meets the requirements of this subpart within 30 calendar days from the date of issuance of the proposed notice.
 - iii. If the FAA does not receive the information required by [paragraph d.3.ii.](#) of this section within 30 calendar days from the date of the issuance of the proposed notice, the FAA will issue a notice rescinding the declaration of compliance.
4. If the Administrator determines that an emergency exists in accordance with [paragraph d.2.iii.](#) of this section, the FAA will exercise its authority under [49 U.S.C. 46105c.](#) to issue an order rescinding a declaration of compliance without initiating the process in [paragraph d.3.](#) of this section.
- e. ***Petition to reconsider the rescission of a declaration of compliance.*** A person subject to an order of rescission under [paragraph d.3.](#) of this section may petition the FAA to reconsider the rescission of a declaration of compliance by submitting a request to the FAA in a manner specified by the Administrator within 60 days of the date of issuance of the rescission.
 1. A petition to reconsider the rescission of a declaration of compliance must demonstrate at least one of the following:
 - i. A material fact that was not present in the original response to the notification of the safety issue and an explanation for why it was not present in the original response;
 - ii. The FAA made a material factual error in the decision to rescind the declaration of compliance, or
 - iii. The FAA did not correctly interpret a law, regulation, or precedent.
 2. Upon consideration of the information submitted under [paragraph e.1.](#) of this section, the FAA will issue a notice either affirming the rescission or withdrawing the rescission.
- f. ***Inapplicability of part 13, subpart D, of this chapter.*** Part 13, subpart D, of this chapter, does not apply to the procedures of [paragraphs d.](#) and [e.](#) of this section.

§ 107.165 Record retention.

- a. A person who submits a declaration of compliance under this subpart must retain and make available to the Administrator, upon request, the information described in [paragraph a.1.](#) of this section for the period of time described in [paragraph a.2.](#) of this section.
 1. All supporting information used to demonstrate the small unmanned aircraft meets the requirements of §§ 107.120a., for operations in Category 2, and 107.130a., for operations in Category 3.
 2. The following time periods apply:

- i. If the person who submits a declaration of compliance produces a small unmanned aircraft, that person must retain the information described in paragraph a.1. of this section for two years after the cessation of production of the small unmanned aircraft system for which the person declared compliance.
 - ii. If the person who submits a declaration of compliance designs or modifies a small unmanned aircraft, that person must retain the information described in paragraph a.1. of this section for two years after the person submitted the declaration of compliance.
- b. A person who submits a means of compliance under this subpart must retain and make available to the Administrator, upon request, and for as long as the means of compliance remains accepted, the detailed description of the means of compliance and justification showing how the means of compliance meets the requirements of [§§ 107.120a.](#), for operations in Category 2, and 107.130a., for operations in Category 3.

Subpart E—Waivers

§ 107.200 Waiver policy and requirements.

- a. The Administrator may issue a certificate of waiver authorizing a deviation from any regulation specified in [§ 107.205](#) if the Administrator finds that a proposed small UAS operation can safely be conducted under the terms of that certificate of waiver.
- b. A request for a certificate of waiver must contain a complete description of the proposed operation and justification that establishes that the operation can safely be conducted under the terms of a certificate of waiver.
- c. The Administrator may prescribe additional limitations that the Administrator considers necessary.
- d. A person who receives a certificate of waiver issued under this section:
 - 1. May deviate from the regulations of this part to the extent specified in the certificate of waiver, and
 - 2. Must comply with any conditions or limitations that are specified in the certificate of waiver.

§ 107.205 List of regulations subject to waiver.

A certificate of waiver issued pursuant to § 107.200 may authorize a deviation from the following regulations of this part:

- a. [Section 107.25](#)—Operation from a moving vehicle or aircraft. However, no waiver of this provision will be issued to allow the carriage of property of another by aircraft for compensation or hire.
- b. Section 107.29a.2. and b.—Anti-collision light required for operations at night and during periods of civil twilight.
- c. Section 107.31—Visual line of sight aircraft operation. However, no waiver of this provision will be issued to allow the carriage of property of another by aircraft for compensation or hire.
- d. Section 107.33—Visual observer.
- e. Section 107.35—Operation of multiple small unmanned aircraft systems.
- f. Section 107.37a.—Yielding the right of way.
- g. Section 107.39—Operation over people.

- h. Section 107.41—Operation in certain airspace.
 - i. Section 107.51—Operating limitations for small unmanned aircraft.
 - j. Section 107.145—Operations over moving vehicles.
- [Docket FAA–2015–0150, Amdt. 107–1, 81 FR 42209, June 28, 2016, as amended by Amdt. No. 107–8, [86 FR 4387](#), Jan. 15, 2021]