

## Unit 1: Pathway to Certification

Unit 1 Vocabulary

Unit 1 Concepts

Unit 1 Performance Objectives

- 1.1 – The Need to Regulate Airspace
  - 1.2 – The NTSB (National Transportation Safety Board)
  - 1.3 – The FAA (Federal Aviation Administration)
  - 1.4 – UAS Incidents and FAA Response
  - 1.5 – Regulations of UAS Operations
  - 1.6 – State and Local Restrictions/Control
  - 1.7 – Hobby and Recreational Use
  - 1.8 – sUAS Remote Pilot Certification for Commercial Use
  - 1.9 – Part 107 Certificate ... A Closer Look
  - 1.10 – Private Pilot's License Not Needed
  - 1.11 – sUAS Regulations
  - 1.12 – Taking the Knowledge Test
  - 1.13 – The Knowledge Test ... A Closer Look
  - 1.14 – Knowledge Test Cost and Acquisition
  - 1.15 – Future Challenges for Regulation
  - 1.16 – Current Uses and Future Potential
- Unit 1 Summary

## Unit 2: Drone Theory & Aeronautical Basics

Unit 2 Vocabulary

Unit 2 Concepts

Unit 2 Performance Objectives

- 2.1 – What is a Drone?
  - 2.2 – Drone Reputation
  - 2.3 – Development of Small UAVs
  - 2.4 – What's in a Name?
  - 2.5 – Types of Small UAVs (sUAV)
  - 2.6 – Drone Components
  - 2.7 – What is Aerodynamics?
  - 2.8 – Newton's Laws of Force and Motion
  - 2.9 – Bernoulli's Principle
  - 2.10 – Airfoils
  - 2.11 – Four Forces of Flight
  - 2.12 – Mechanical Design of an Airplane
  - 2.13 – Three Axes of Flight
  - 2.14 – How Multicopters Fly
  - 2.15 – The Pilot's Alphabet
- Unit 2 Summary

## Unit 3: Regulations & Operating Rules

Unit 3 Vocabulary

Unit 3 Concepts

Unit 3 Performance Objectives

- 3.1 – Eligibility for Part 107 Certification
  - 3.2 – FAA Definitions Pertaining to Part 107
  - 3.3 – Responsibilities of the Remote PIC
  - 3.4 – Required Documentation for sUAS Flight
  - 3.5 – The Importance of Documentation
  - 3.6 – Registration Requirements for sUAS Operations
  - 3.7 – Part 107 Daylight Operation Regulation
  - 3.8 – Visual Line-of-Sight (VLOS)
  - 3.9 – Requirements for Visibility, Cloud Clearance, Altitude & Speed
  - 3.10 – Yielding the Right-of-Way
  - 3.11 – Operations over Non-Participants
  - 3.12 – On the Move
  - 3.13 – Privacy Considerations & Flight over Stadiums/Concert Venues
  - 3.14 – Hazardous Operations
  - 3.15 – Alcohol and Drugs
  - 3.16 – Change of Address
  - 3.17 – Authorization & Operation Near Airports
  - 3.18 – 5-Mile Radius Confusion
  - 3.19 – Waivers & Authorizations
  - 3.20 – FAA "Trick" Questions
- Unit 3 Summary

## Unit 4: Airspace Classification & Operating Procedures

Unit 4 Vocabulary

Unit 4 Concepts

Unit 4 Performance Objectives

- 4.1 – Understanding Airspace Designations
- 4.2 – NOTAMs (Notices to Airmen) & Temporary Flight Restrictions (TFRs)
- 4.3 – Aeronautical Sectional Charts
- 4.4 – Class A Specifics
- 4.5 – Class B Specifics
- 4.6 – Class C Specifics
- 4.7 – Class D Specifics
- 4.8 – Class E Specifics
- 4.9 – Class G Specifics

- 4.10 – Special-Use Airspace
- 4.11 – AGL vs. MSL
- 4.12 – Airspace Tidbits
- 4.13 – Military Training Routes
- 4.14 – Importance of Airspace Knowledge
- Unit 4 Summary

## **Unit 5: Aviation Weather, Effects & Sources**

- Unit 5 Vocabulary
- Unit 5 Concepts
- Unit 5 Performance Objectives
- 5.1 – The Influence of Weather
- 5.2 – Military Time & ZULU Time
- 5.3 – METARs
- 5.4 – TAFs
- 5.5 – Weather Briefs
- 5.6 – Stable vs. Unstable Air
- 5.7 – Wind & Surface Friction
- 5.8 – Air Masses & Fronts
- 5.9 – Fog, Icing & Cloud Types/Formations
- 5.10 – Thunderstorms
- 5.11 – Visibility & Clouds
- 5.12 – Knowledge Test METAR Table
- 5.13 – More Potential Knowledge Test Questions
- Unit 5 Summary

## **Unit 6: sUAS Loading & Performance**

- Unit 6 Vocabulary
- Unit 6 Concepts
- Unit 6 Performance Objectives
- 6.1 – Aeronautical Stability
- 6.2 – Flying a Payload
- 6.3 – Determining Speed & Altitude
- 6.4 – Weight and Balance
- 6.5 – Uncontrollable Performance Factors
- 6.6 – Load Factor Applied to Physics
- 6.7 – Avoid superseding your Critical “Angle of Attack”
- 6.8 – Basic “Center-of-Gravity” Performance
- Unit 6 Summary

## **Unit 7: Emergency Flight Procedures**

- Unit 7 Vocabulary
- Unit 7 Concepts
- Unit 7 Performance Objectives
- 7.1 – OMG!
- 7.2 – Lost Link Procedures
- 7.3 – Fly-Away Procedures
- 7.4 – Battery Fire Procedures
- 7.5 – Reporting Accidents
- 7.6 – Collision Avoidance
- Unit 7 Summary

## **Unit 8: Crew Resource Management (CRM)**

- Unit 8 Vocabulary
- Unit 8 Concepts
- Unit 8 Performance Objectives
- 8.1 – Remote PIC Responsibilities Re-Emphasized
- 8.2 – Aeronautical Decision-Making and Judgement
- 8.3 – CRM Effectiveness
- 8.4 – Hazardous Attitudes
- 8.5 – Physiological/Medical Factors that Affect Pilot Performance
- 8.6 – Drugs and Alcohol Revisited
- 8.7 – Contingency Reactions
- Unit 8 Summary

## **Unit 9: Radio Communications**

- Unit 9 Vocabulary
- Unit 9 Concepts
- Unit 9 Performance Objectives
- 9.1 – Can You Hear Me Now?
- 9.2 – Proper Radio Procedures
- 9.3 – Chart Supplements U.S. (formerly Airport Facility Directory)
- 9.4 – Sectional Chart Frequencies
- Unit 9 Summary

## Unit 10: Airport Operations

Unit 10 Vocabulary

Unit 10 Concepts

Unit 10 Performance Objectives

10.1 – Know the “Rules of the Road (er ... Sky)”

10.2 – NOTAMs & TFRs

10.3 – Mountains, and Towers, and PowerLines, oh My!

10.4 – AGL (Above Ground Level) vs. MSL (MeanSea Level)

10.5 – Airport Traffic Patterns

10.6 – sUAS Flight Frequencies

10.7 – NTIA Drone Privacy “Best Practices”

10.8 – VFR Sectional Chart Symbols

10.9 – Longitude & Latitude

10.10 – More Sectional Chart Reading

10.11 – More VFR Sectional Chart Symbols

10.12 – Nautical Miles (NM) / Statute Miles (SMor MI)

Unit 10 Summary

## Unit 11: Maintenance & Inspection Procedures

Unit 11 Vocabulary

Unit 11 Concepts

Unit 11 Performance Objectives

11.1 – Before You Fly ...

11.2 – Preflight Inspection

11.3 – Scheduled & Unscheduled Maintenance

11.4 – Benefits of

Recordkeeping Unit 11 Summary

## Unit 12: FAA Knowledge Test – Exam Prep

12.1 – Let’s Do It!

12.2 – Testing Supplement

12.3 – Sample Questions

-- Remote Pilot Question Study Guide(300 Practice Questions)

## Unit 13.1: PART 107 UPDATES OVERVIEW (MARCH 2021)

- New FAA Drone Rules for Recreational and Commercial Pilots
- Determining the type of Drone Pilot you are

-- The Current Rules for Recreational and Commercial Pilots

-- New Drone Rules that the FAA announced

-- Part 107 Pilots – Night Flying

-- Part 107 Pilots – Flying over people

-- Part 107 Pilots – Flying over moving vehicles

-- Demonstration of Compliance

-- Recreational Flyers – Flying at night, over moving vehicles, and over people

-- Remote ID

-- Remote Pilot Knowledge Test

-- Effective Timelines for the New Rules

13.1 - Questions

## Unit 13.2: PART 107 UPDATES OVERVIEW (MARCH 2021)

-- Educational Users

-- Flying for Education

-- Flying a drone: Know the Rules

-- Part 107

-- Exception for Recreational Flyers and Community-Based Organizations

-- Institutions of Higher Education

-- Learn Where You Can Fly

-- Learning about drones: FAA Safety Team (FAASafetyTeam) \ DronePro Program

-- Recreational Flyers and Modeler Community-Based Organizations

-- Follow these rules

-- Changes Coming Later This Year

13.2 – Questions

## Unit 13.3: PART 107 UPDATES OVERVIEW (MARCH 2021)

-- Part 107 Pilots – Night Flying

-- Flying your drone at night. (Section 107.29 Operation at Night.)

-- Additional Information – Operations at Night

13.3 – Questions

## **Unit 13.4: PART 107 UPDATES OVERVIEW (MARCH 2021)**

- Part 107 – Operations Over People & Moving Vehicles
- Operations Over People
  - Category 1
  - Category 2
  - Category 3
  - Category 4
- Operations over moving vehicles
  - Inspection, testing, and demonstration of compliance
- Design and Production Rules for Manufacturers
- Major Changes from Proposed Rule to Final Rule
- 13.4 - Questions

## **Unit 13.5: PART 107 UPDATES OVERVIEW (MARCH 2021)**

- UAS Remote ID Overview
- Meeting the requirements of the Remote ID Rule
- What is FRIA?
- Compliance with the Remote ID Rule
- Broadcast Information from Remote ID
- Access to the Remote ID Broadcast
- Turning off Remote ID
- Remote ID Compliance Date
- Manufacturer Compliance
- Remote ID and Educational Institutions
- Advantages for Autonomous Drones
- 13.5 - Questions

## **Unit 13.6: PART 107 UPDATES OVERVIEW (MARCH 2021)**

- Aeronautical Knowledge and Safety Test Updates
  - Part 107 Initial Test Changes
  - New testing questions
  - Night-Flying Tips
  - Visual illusions at night
  - How to scan
  - Physiological Conditions Which May Degrade Night Vision

- Hazard Identification
- Ways to Protect Your Night Vision
- Final Rule Specifications for Night Flying
- No More Recurrent Test for Existing Part 107 Pilots
- The Recreational UAS Safety Test (TRUST)
- 13.6 – Questions

## **Unit 14: FAA Knowledge Test – SUPPLEMENTAL QUESTIONS**

- 14.1 – Let’s Do It!
- 14.2 – Testing Supplement
- 14.3 – Sample Questions
- Remote Pilot Question Study Guide(60 Practice Questions)

### ***Supplements***

#### ***Supplement A – Exam Resources***

- A.1 – Resource Links
- A.2 – Step-by-Step Guide to Remote Pilot Certification
- A.3 – FAQs
- A.4 – Using IACRA

#### ***Supplement B – Choosing the Right Drone***

- B.1 – Determining Your Purpose
- B.2 – Configuration Considerations
- B.3 – Build or Buy?
- B.4 – Buying Drones for Commercial Use
- B.5 – sUAS Consumer Guides
- B.6 – Determining Your Purpose
- B.7 – Configuration Considerations
- B.8 – Build or Buy?
- B.9 – Buying Drones for Commercial Use
- B.10 – sUAS Consumer Guides

#### ***Supplement C – LiPo Battery Care***

- C.1 – LiPo Battery Maintenance and Care
- C.2 – LiPo Chargers
- C.3 – Use of LiPo Bags
- C.4 – Charging Temperatures
- C.5 – Charging Rates
- C.6 – Discharging Rates
- C.7 – Working Temperatures
- C.8 – Battery Puffing
- C.9 – “Breaking-in” New LiPo Batteries
- C.10 – Handling Damaged LiPo Batteries
- C.11 – Storage and Shelf-Life of your

LiPoBattery

C.12 – The 80% Rule: Retiring LiPo Batteries

C.13 – Disposal of LiPo Batteries

**Supplement D – Common Sense Flying**

D.1 – Being Responsible

D.2 – “No-Fly” Zones vs. “Notify” Zones

D.3 – Be “Neighborly”

D.4 – Get It Registered!

D.5 – Common Sense Safety

D.6 – Revisiting Educational and  
RecreationalUse

**Supplement E – Focus on Flight Skills  
(Beginning)**

E.1 – First Things First

E.2 – Working with Lightweight Drones

E.3 – Recreational Use Laws

Summarized:Outdoor Use

E.4 – Propeller Awareness

E.5 – Other Safety Assurances

E.6 – Ground Effect & Prop Wash

E.7 – Controller Basics

E.8 – Ready, Set, Go ...!

E.9 – Beginning Flight SkillsSkill 1

Skill 2

Skill 3

Skill 4

**Supplement F – Focus on Flight Skills  
(Advanced)**

F.1 – Advanced Flight

SkillsSkill 5

Skill 6

Skill 7

Skill 8

Skill 9

## CURRICULUM TIMELINE

This curriculum is extremely thorough while allowing for flexibility. The instructor has the option to teach the entire curriculum and have the students compete all the activities, or the instructor can pick, choose, and/or skip any of the activities or quizzes. Instructors may also decide to include projects of their own. Below is a suggested timeline showing minimum and maximum days for each Unit.

(1 day = 60-minute class)

	Description	Minimum # days (if some activities are skipped)	Maximum # days (if all activities completed)
<b>Unit 1: Pathway to Certification</b>	Covers role of the FAA and NTSB. Stresses importance of regulation and lists registration and recreational use of drones. Section 333 Exemptions and Part 107 Rules are explained.	4	6
<b>Unit 2: Drone Theory &amp; Aeronautical Basics</b>	Covers nomenclature, reputation, configurations, basic components, and current/future uses of drones. Introduces aerodynamics, Newton's Laws of Motion, Bernoulli's Principle, four forces of flight, three axes of flight, how they apply to drone flight.	5	8
<b>Unit 3: Regulations &amp; Operating Rules</b>	Covers general FAA requirements for Remote Pilot Certification including definitions and responsibilities.	6	9
<b>Unit 4: Airspace Classifications &amp; Operating Procedures</b>	Covers airspace classifications, how to identify them on Sectional Charts and regulations governing sUAS flight in and around airspace.	5	8
<b>Unit 5: Aviation Weather, Effects &amp; Sources</b>	Covers effects of weather on flight including altitude, cloud formations, thunderstorms, and fog.	5	8
<b>Unit 6: sUAS Loading &amp; Performance</b>	Covers weight and balance considerations for payload. Also, effects of physics on flight maneuvers regarding Center of Gravity.	3	4
<b>Unit 7: Emergency Flight Procedures</b>	Covers types of emergencies including lost link and fly-aways and how to respond to them.	3	4
<b>Unit 8: Crew Resource Management (CRM)</b>	Covers Remote PIC decision-making when recognizing crewmember health. Includes physiological and medical issues.	3	5
<b>Unit 9: Radio Communications</b>	Covers types of radio communications used by manned pilots and how to locate the frequencies.	3	4
<b>Unit 10: Airport Operations</b>	Covers operations around airports including standard traffic patterns and other issues the Remote PIC needs to be aware of.	5	8
<b>Unit 11: Maintenance &amp; Inspection Procedures</b>	Covers preflight responsibilities and importance of documentation required by the FAA.	3	4
<b>Unit 12: FAA Knowledge Test – Exam Prep</b>	Provides practice questions and a link to an online practice test available for students.	5	10
<b>Unit 13: All Parts</b>	Provides newest information regarding flying at night, flying over people, and flying over moving vehicles. Also Remote ID .	3	3
<b>Unit 14: FAA Knowledge Test – Supplemental</b>	Provides practice questions and a link to an online practice test available for students.	3	5
<b>Supplements</b>		---	8
<b>TOTALS:</b>		<b>56</b>	<b>94</b>