

# 20-HOUR ADVANCED RPAS GROUND SCHOOL SYLLABUS

## Course Title: Professional RPAS Pilot Certification: Advanced Operations

|                             |                                             |                     |                                                                 |
|-----------------------------|---------------------------------------------|---------------------|-----------------------------------------------------------------|
| <b>Delivery Format:</b>     | Synchronous Online (Live Instructor-Led)    | <b>Total Hours:</b> | 20 Hours (Inclusive of Instruction & Integrated Practical Labs) |
| <b>Regulatory Standard:</b> | Transport Canada Standard 921.05 / TP 15263 | <b>Provider:</b>    | Summit RPAS Compliance & Consulting                             |

## COURSE DESCRIPTION

This course provides comprehensive ground training for commercial drone pilots preparing for the Transport Canada Advanced Operations RPAS Pilot Certificate written exam and Flight Review. Led by a qualified Level 1 Complex Operations (L1CO) RPAS pilot, with guest lectures from experienced aviation professionals, the program combines live synchronous instruction with an active practical lab where students apply real-world tools (including aeronautical charts, weather products, and air traffic authorization portals) to master complex field operations.

## COURSE LEARNING OUTCOMES

On completion of this course the student will be able to:

- **1. Interpret and apply** Canadian Aviation Regulations (CARs Part IX), the Aeronautics Act, and NAV CANADA airspace classifications to establish legal flight boundaries and required air traffic approvals.
- **2. Evaluate** RPAS airframe components, LiPo battery chemistry, C2 link dynamics, and local RF environments to troubleshoot system anomalies and prevent link degradations.
- **3. Analyze** human factors, crew resource management (CRM) principles, and physiological limitations (using the IM SAFE framework) to mitigate operational fatigue and hazardous attitudes.
- **4. Decode and synthesize** official aviation weather products (METARs, TAFs, GFAs) to evaluate atmospheric hazards, density altitude, microclimates, and Go/No-Go environmental limits.
- **5. Execute** aeronautical navigation and physical site surveys (CAR 901.27) using VNC/VTA charts, the Canada Flight Supplement (CFS), NOTAMs, and weight/balance calculations.
- **6. Apply** aerodynamic principles (including the four forces of flight, load factors in banked turns, stall dynamics, and vortex ring state) to maintain safe airframe control limits during maneuvers.
- **7. Demonstrate** standard aviation radiotelephony phraseology and radio procedures (ROC-A standards) to communicate effectively on Mandatory Frequencies (MF) and Aerodrome Traffic Frequencies (ATF).
- **8. Formulate** emergency response procedures (lost-link, fly-away, airspace intruders) and demonstrate practical operational readiness for Transport Canada Flight Reviews (TP 15395E / Standard 921.02).

## INTEGRATED PRACTICAL LAB CURRICULUM

Running concurrently alongside the lecture modules, students complete hands-on scenario challenges using real industry tools:

- **Lab 1: Weather Decoding & Minima Evaluation:** Deciphering raw METARs, TAFs, and GFAs; calculating density altitude and assessing convective/icing risks.
- **Lab 2: Aeronautical Chart & CFS Navigation:** Plotting coordinates on VNC/VTA maps, identifying airspace ceilings/floors, and extracting aerodrome frequencies and layouts from the Canada Flight Supplement (CFS).

- **Lab 3: Advanced Site Survey Creation (CAR 901.27):** Building a complete physical site survey map, identifying controlled ground areas, calculating 1-to-1 ground risk buffers, and establishing emergency landing zones.
- **Lab 4: Airspace Access & NAV CANADA Authorization:** Searching active NOTAMs, evaluating Class C/D/E Control Zones, and submitting live flight requests through the NAV Drone portal.
- **Lab 5: Field Troubleshooting & Emergency Incident Response:** Simulating in-flight emergency responses (lost link, fly-away, airspace intruder), diagnosing C2/battery anomalies, and drafting root-cause analysis reports.
- **Lab 6: Radiotelephony & VFR Aerodrome Radio Calls:** Practicing standard aviation radio broadcasts on a handheld VHF or simulator for entering, flying, and departing MF/ATF aerodromes, including blind broadcasts and MAYDAY/PAN-PAN calls.
- **Lab 7: Weight, Balance & Battery Endurance Calculations:** Calculating Maximum Takeoff Weight (MTOW) with payload additions, Center of Gravity (CG) shifts, and battery endurance adjustments for cold weather or wind loads.
- **Lab 8: Crew Briefings & Human Factors (IM SAFE / CRM):** Conducting structured pre-flight crew briefings (PIC to VO), establishing visual scanning sectors, communication protocols, and applying the IM SAFE fitness checklist.
- **Lab 9: TSB & Transport Canada Occurrence Reporting (CAR 901.49):** Completing mock Transport Canada / TSB accident and occurrence notification forms following simulated field incidents.

## MODULE BREAKDOWN & SCHEDULE

| Module & Hours                                                                   | Core Curriculum Topics                                                                                                                                                                                                                                 | Lab Integration & Assessment                                                                                                |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Module 1</b><br><b>Airspace Law &amp; Pilot Responsibility</b><br>(2.5 Hours) | Aeronautics Act, CARs Part IX (Divisions I, II, V, X), Airspace Classifications (A-G), Class F Special Use (Advisory vs. Restricted), Aerodromes vs. Certified Airports, legal PIC authority, 24-month recency (CAR 901.65).                           | Lab 4: Navigating DSST, pulling live NOTAMs, Control Zone evaluations.<br>Assessment: Quiz 1 (10 Qs)                        |
| <b>Module 2</b><br><b>Professional RPAS Systems</b><br>(2.0 Hours)               | Multi-rotor and fixed-wing maintenance, LiPo battery chemistry, discharge curves, C-ratings, TDG regulations for transport, C2 link dynamics (Fresnel zone, attenuation, RF sweep, EMI/K-index), GCS altitude metrics (AGL, ASL, HAE, Baro-corrected). | Lab 7: Weight/balance, MTOW payload limits, battery endurance under wind/temp.<br>Assessment: Quiz 2 (10 Qs)                |
| <b>Module 3</b><br><b>Human Factors</b><br>(2.0 Hours)                           | Aviation physiology (visual scanning, empty field myopia, fatigue, IM SAFE checklist), Aviation psychology (5 Hazardous Attitudes, CRM, Reason's Unsafe Acts Model), automation complacency, crew communication protocols.                             | Lab 8: Pre-flight crew briefings, VO sector assignments, CRM handshakes.<br>Assessment: Quiz 3 (10 Qs)                      |
| <b>Module 4</b><br><b>Meteorology</b><br>(2.5 Hours)                             | Atmospheric pressure, high/low systems, density altitude calculations, surface layers (fog, haze, micro-climates), mechanical/thermal turbulence, urban airflow dynamics (vorticity, rooftop shear), cold fronts, aircraft icing hazards.              | Lab 1: Decoding METAR/TAF weather strings, Go/No-Go criteria.<br>Assessment: Quiz 4 (10 Qs)                                 |
| <b>Module 5</b><br><b>Navigation</b><br>(2.5 Hours)                              | Lat/Long coordinate plotting, true vs. magnetic north (variation/deviation), VNC and VTA chart symbols, Canada Flight Supplement (CFS) decoding, time/distance/speed/energy calculations.                                                              | Lab 2: Plotting flight paths on VTA charts, CFS aerodrome data extraction.<br>Assessment: Quiz 5 (10 Qs)                    |
| <b>Module 6</b><br><b>Flight Operations</b><br>(2.5 Hours)                       | Mandated site survey procedures (CAR 901.27), weight and balance, SOP development, CAR 901.23 emergency checklists (lost-link, fly-away, C2 failure, crew incapacitation), occurrence reporting to TSB/TC (CAR 901.49).                                | Lab 3: CAR 901.27 Site Survey dossier.<br>Lab 9: TSB/TC incident notification report.<br>Assessment: Quiz 6 (10 Qs)         |
| <b>Module 7</b><br><b>Theory of Flight</b><br>(1.5 Hours)                        | Bernoulli's principle, Newton's laws, 4 forces of flight, multirotor thrust dynamics, load factor (G-forces) in banked turns, stall dynamics, settling with power (vortex ring state), autorotation.                                                   | Lab 5: Troubleshooting airframe structural stresses, prop micro-cracks, aerodynamic failures.<br>Assessment: Quiz 7 (10 Qs) |
| <b>Module 8</b><br><b>Radiotelephony</b>                                         | Industry Canada ROC-A study guide material, aviation VHF radio operation, standard phraseology, MF/ATF                                                                                                                                                 | Lab 6: Simulated VHF radio calls for MF/ATF aerodromes.                                                                     |

**(1.5 Hours)**

uncontrolled aerodrome reporting procedures, blind broadcasts, emergency MAYDAY/PAN-PAN calls.

Assessment: Quiz 8 (10 Qs)

**Module 9  
Flight Review Prep  
(1.5 Hours)**

Standard 921.02 flight review evaluation criteria, TP 15395E Flight Reviewer Guide, candidate oral exam prep, pre-flight briefing protocols, practical flight maneuver standards.

Lab 8: Simulated flight review briefing and oral defense.  
Assessment: Readiness Checklist & Quiz 9**Module 10  
Mock Exam & Wrap-Up  
(1.5 Hours)**

High-yield exam topic review, feedback review analysis, test-taking strategies, final Q&amp;A session.

Final Exam: 50-Question Transport Canada Advanced Mock Written Exam (Timed, 80% pass standard).