KPBSD Aerial Cinematography Curriculum - 2017

Industry Standards

Airman Certification Standards

1. Airport Communications.
2. Common Traffic Advisory Frequency (CTAF) monitoring and communications.
3. Traffic advisory best practices.
4. Automatic Terminal Information Services (ATIS).
5. Aircraft Call signs.
6. Phraseology and phonetic alphabet.
7. Crew Resource Management.
8. Situational Awareness:
   - PIC and VO must maintain effective communication at all times.
9. General Loading and Performance.
10. Predicting Aircraft Performance.
11. Loss of aircraft control link.
12. Loss of Global Positioning Systems.
13. Frequency spectrums and limitations.
14. Inspection, testing, and compliance.
15. Responsibility of remote PIC Preflight actions for operation.
16. Basic maintenance.
17. Preflight.
18. Failure mitigation.
19. Record keeping:
    - Inspection, testing, and compliance.
    - Condition for safe operation.

Transfer Goals

Students will be able to independently use their learning to…

- Communicate industry specific ideas through the use and understanding of industry-specific vocabulary.
- Communicate in a format that is universal to all operators.

Meaning

ENDURING UNDERSTANDINGS

Students will understand…

- How to recall, recognize, and utilize industry specific vocabulary both in and out of contextual Unmanned Aircraft System (UAS) conversations.
- There are multiple forms of UAS.
- Professional pilots can identify aircraft styles by sight.
- Professional pilots know the purposes and limitations of different styles of aircraft and utilizes the correct aircraft for specific flight operations.
- Newton's laws of motion affect flight and flight maneuvers.
- The application of multiple physics concepts and their relationship to flight and flight maneuvers.
- RC units communicate in different ways based on needs.
- Integrated video downlink allows smooth, easy, user-friendly control of content.
- UAS are comprised on multiple task-specific systems functioning towards successful flight operations.

ESSENTIAL QUESTIONS

Students will keep considering…

- How do industry professionals communicate?
- What comprises the UAS lexicon?
- What is UAS and how do they work?
- What areas are UAS used and where are new uses emerging?
- What responsibilities are inherent to UAS operations?
- What types of UAS occupy the sky and what are their purposes?
- What are efficient ways to identify aircraft styles and purposes?
- How do Newton's laws of motion make the Bernoulli Principle possible?
- How does the Bernoulli principle ensure flight?
- What are the six basic flight concepts every pilot must understand?
- How do specific situations dictate RC operations?
- How do video downlinks UI platforms integrate into flight control and operations?
- What are the four main systems an operator should know and be extensively familiar with?
- What steps can a UAS operator take to ensure longevity of equipment?

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○ PIC is final authority and responsible for safe operation and compliance. 20. Importance and use of aircraft specific performance data. 21. Conditions for safe operation. 22. PIC responsibility. 23. Preflight familiarization. 24. Preflight inspection: ○ Ensure conditions for safe operations. ○ PIC is final authority and ensures safety of the flight. ○ No hazardous operations. 25. Potential flight hazards. 26. Avoiding wildlife hazards. 27. Emergency planning and communication. 28. Potential hazards of LiPo batteries. 29. Lost Link Procedures. 30. Loss of GPS Procedures. 31. Radio frequency limitations. 32. Aeronautical Decision Making (ADM). 33. Crew Resource Management (CRM). 34. Situational Awareness (SA). 35. Hazardous Attitudes. 36. Physiological factors such as fatigue, stress, substance use, and environment factors contribute to hazardous flight conditions. 37. Basic weather minimums. 38. Demonstrates ability to utilize multiple sources of weather information for flight planning.	• Proper pre and post-flight inspections of systems are critical to successful UAS flight operations. • Knowing how to read and navigate technical manuals (paper and electronic versions) allows for continuous learning. • Environmental factors affect the use and performance of UAS before, during, and after flight operations. • Concrete and well-performed pre-flight checks are critical for continued, successful flight operations. • Basic flight moves are critical to pilot development. • Remote settings vary, but flight terms for aircraft movement are consistent. • There are steps that can be taken to monitor and mitigate hazards in the event of a hazardous situation. • FAA Part 107 is the guiding regulation in relationship to UAS operations. • Commercial regulations differ significantly from hobbyist rules. • Weather affects UAS flight. • Flight preparation includes close attention to a variety of reports and applications. • Basic understanding of camera operations is a valuable skill for UAS pilots. • Virtual simulation allows for practicing safety and best practices SOP in a controlled environment before physical flight activities. • UAS technologies are a disruptive technology and their uses are growing at an exponential rate.	• How are UAS technical and user manuals structured? • What factors affect UAS operations? • What are the standards checks for pre-flight operations? • What are proper takeoff and landing procedures? • In what ways do UAS move? • How do we combine basic movements into more sophisticated flight operations? • What should a pilot always monitor to avoid hazardous situations due to vehicle malfunction? • What does FAA Part 107 say and what does it mean? • What types of weather and atmospheric phenomena affect UAS flight operations? • How can pilots monitor and plan for these phenomena? • What formats are available and how does a pilot control them? • What must happen with the camera to record a good shot? • How does flight simulation help build better pilots? • What is UAS used for and in what ways does it change the labor market? • What is a man or chart legend and how does it work? • How do pilots use maps and charts to plan flight operations? • How can pilots locate their current or desired position on a map or aeronautical chart when GPS is not available?

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<tr>
<td rowspan="3">39. Understands performance impact of different weather factors.
40. Visual line of sight of aircraft.
41. Visual observer.

ALASKA STANDARDS ALIGNMENT:
Cinematography</td>
<td>• Land navigation is the first step towards airspace conceptualization and flight planning.
• Airspace consists of invisible borders designated by colors and gradients on two-dimensional charts.
• Airspace governs where pilots can legally and safely conduct operations.
• Certain aspects of radio control and battery types and usage are inherently needed for communication of operation expectations and planning and safer flight operations.</td>
<td>• What is airspace and what airspace can UAS operate in?
• What terms are necessary for pilots to know and understand about batteries, battery safety, and RC operations?</td>
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<tr>
<td colspan="2">Acquisition</td>
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<td>Students will know…
• Industry-specific vocabulary in and out of contextual UAS conversations.
• History, current uses and future uses of UAS.
• Aircrafts have different shapes and purposes.
• Uses and purposes of multiple forms of UAS.
• The Bernoulli Principle.
• Newton’s laws affect flight and flight maneuvers.
• Six basic flight concepts every pilot must understand.
• Applications of frequency theory.
• The relationship between multiple user interface applications and flight operations.
• UAS components, sections, and systems, and the purposes and interactions with each other.
• Structure and content of vehicle-specific UAS technical manuals.
• AK Aerial pre-flight check procedures.
• Multidimensional ways to move UAS.
• The movement limitations of an aircraft.</td>
<td>Students will be skilled at…
• Utilizing industry-specific language in UAS conversations.
• Practicing UAS in their operations.
• Identifying multiple forms of UAS and explaining their purpose and design advantages for those specific industry uses.
• Applying the Bernoulli Principle to flight plans.
• Applying Newton’s laws of motion to flight maneuvers.
• Practice the six core concepts to fly safely and efficiently.
• Exploring and practicing dual control UAS operations.
• Manipulating control frequencies to adjust to ambient set differences.
• Conducting ongoing inspections and maintenance of UAS components, sections, and systems.
• Navigating electronic and paper technical manuals.</td>
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	• UAS Emergency and hazard procedures. • The meaning and intent of FAA Part 107. • Atmospheric phenomena and air density are critical for pilots to understand. • The use of SIGMET, TAR, and METAR data into pre-flight planning and operations. • How to adapt white balance when needed. • Formats and their UAS operations. • Current UAS uses and the industries they are currently used for. • Ways pilots can ensure professional and safe operations. • How to read a topographical map and Aeronautical chart. • Airspace is two and three dimensional. • Parameters of airspace designations in relationship to flight operations and regulations. • AK Aerial vocabulary acquisition system to build industry specific lexicon. • Ambient signals and their effects on RC communication. • Theories related to radio control signals and frequencies.	• Using UAS technical manuals in problem-based UAS scenarios. • Practicing and completing multiple UAS takeoff and landing procedures during both simulated and physical flight operations. • Utilizing AK Aerial Kinetic Flight Manifestation Systems. • Moving UAS in multidimensional ways. • Combining basic movements into more sophisticated flight operations. • Practicing basic flight maneuvers in simulated and applied flight operations. • Practicing and presenting strategies and emergency procedures for mitigation in verbal and written flight situations. • Applying a guided reading and understanding of application sections of FAA 107 to all AK Aerial coursework. • Practicing in simulated COW/COA flying. • Utilizing applications and research materials to monitor weather in flight preparations. • Interpreting and integrating data into flight planning and operations. • Formatting SD cards for UAS operations. • Adjusting ISO on UAS cameras. • Adapting shutter speed to needs of specific operations. • Manipulating focal ratio to adjust depth of field operations. • Adapting white balance when needed. • Practicing all levels of flight operations in a virtual environment. • Researching industries that use UAS.

		• Utilizing chart legends to identify landmarks, coordinates, and operation positions. • Planning and implementing flight plans through the use of charts, plotters, and web applications. • Identifying airspace in 2D and 3D settings. • Constructing and manipulating 3D models of airspace. • Re-creating 3D models of airspace based on 3D regional sectional. • Utilizing AK Aerial Vocabulary Acquisition System to build industry-specific lexicon.
Evidence		
Evaluative Criteria	**Assessment Evidence**	
Airman Certification Standards	AK Aerial Certification Exam AK Aerial Instructor Assessment AK Aerial Sight ID Formative Assessments. AK Aerial LMS Instructor Flight Assessment FAA Part 107 Exam	
	Ongoing verbal assessments through presentation and participation in UAS industry-specific discussions	
Resources		
AK Aerial UAS Terms Acquisition System AK Aerial LMS AK Aerial Student Handbook		