



# **Introduction to Unmanned Aerial Vehicle (UAV) Flight**

PRE-TEST/POST-TEST TEKS BLUEPRINT

# Pre-Test/Post-Test Development Overview

## TEKS Addressed Selection Process

The Texas Essential Knowledge & Skills (TEKS) included in the course pre-test and post-test were selected for their direct relevance to the course content. This selection process was guided by the goal of assessing learners' understanding of specific topics and skills that are integral to the course. As a result, TEKS related to general employability skills or broader topics were often excluded. This focus ensures that the assessments accurately measure students' mastery of the subject matter, allowing educators to gain a clear insight into areas where students excel or may need additional support. By concentrating on content-specific TEKS, the tests provide a more precise evaluation of the students' knowledge and understanding of the core material.

## Test Question Development Process

The questions created for the pre-test and post-test were designed using psychometric principles to ensure they are of high quality and fairness. This approach helps to accurately assess student understanding. These principles guide the development of questions to be reliable, valid, and free from bias, ensuring that they effectively measure the knowledge and skills the students are expected to acquire in the course.

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Knowledge & Skills Statement	Student Expectation	iCEV Lesson Title
(1) The student demonstrates employability characteristics that lead to success in the Unmanned Aerial Vehicle (UAV) industry. The student is expected to:	(A) determine strategies for effective decision making in the UAV industry;	Crew Resource Management: Decision-Making, CRM Effectiveness & Hazardous Attitudes
(2) The student discusses the professional standards required by the UAV industry. The student is expected to:	(A) identify current and emerging careers in the UAV industry;	Pathway to Certification: Current Uses & Future Potential
(2) The student discusses the professional standards required by the UAV industry. The student is expected to:	(C) identify the credentials and certification requirements for careers in the UAV industry such as licensed pilot;	Pathway to Certification: A Closer Look at Part 107 Certification
(2) The student discusses the professional standards required by the UAV industry. The student is expected to:	(E) research and compile health and safety policies, procedures, regulations, and practices of the UAV industry; and	Pathway to Certification: Recreational & Commercial Use
(3) The student researches and discusses professional, legal, ethical, and organizational norms of the UAV industry. The student is expected to:	(A) define legal terminology that is used in the UAV industry;	Pathway to Certification: A Closer Look at Part 107 Certification
(3) The student researches and discusses professional, legal, ethical, and organizational norms of the UAV industry. The student is expected to:	(B) discusses professional responsivity as it relates to the FAA part 107 license;	Pathway to Certification: A Closer Look at Part 107 Certification
(3) The student researches and discusses professional, legal, ethical, and organizational norms of the UAV industry. The student is expected to:	(C) discusses ethical UAV operation as it relates to current regulations; and	Pathway to Certification: A Closer Look at Part 107 Certification
(3) The student researches and discusses professional, legal, ethical, and organizational norms of the UAV industry. The student is expected to:	(D) identify common organizational norms present within the UAV industry;	Pathway to Certification: Regulating Airspace
(4) The student understands the terminology and regulations governing remote pilots in command. The student is expected to:	(A) define terminology applicable to the operation of UAVs in FAA documentation, including remote pilot in command;	Regulations & Operating Rules: Documentation for Flight & Registration Requirements
(4) The student understands the terminology and regulations governing remote pilots in command. The student is expected to:	(B) explain and analyze the application of emergency powers of a remote pilot in command.	Regulations & Operating Rules: FAA Definitions Pertaining to Part 107
(5) The student analyzes visibility requirements for UAV operation. The student is expected to:	(A) define visual line of sight in relation to the operation of an UAV;	Regulations & Operating Rules: Daylight Operation Regulations & Visual-Line-of-Sight
(5) The student analyzes visibility requirements for UAV operation. The student is expected to:	(B) define and examine the role of visual observer flight operations, including observing the airspace around the pilot and aircraft	Regulations & Operating Rules: FAA Definitions Pertaining to Part 107
(5) The student analyzes visibility requirements for UAV operation. The student is expected to:	(C) identify and interpret operational requirements for using a visual observer;	Regulations & Operating Rules: FAA Definitions Pertaining to Part 107
(5) The student analyzes visibility requirements for UAV operation. The student is expected to:	(D) evaluate the factors that impact visibility such as daylight time, weather, obstacles, and right of way as they relate to the operation of an unmanned aerial vehicle; and	Regulations & Operating Rules: Daylight Operation Regulations & Visual-Line-of-Sight Regulations & Operating Rules: Requirements for Flight
(5) The student analyzes visibility requirements for UAV operation. The student is expected to:	(E) examine which additional technology or conspicuity requirements may exist in a given operational situation, such as automatic dependent surveillance-broadcast (ADS B), transponders, traffic control avoidance system (TCAS), radio equipment, and conspicuity.	Transmitters & Receivers: Flight Modes, Receivers, Frequency Bands & Programming
(6) The student applies the principles of containment and loss of positive control. The student is expected to:	(C) examine the uses of geo-fencing in real-world applications such as mapping obstacle avoidance routes or restricted air spaces.	Flight Controllers: Autonomous Flight & Geo-Fencing
(7) The student understands the rules and regulations on operational limitations in certain airspaces. The student is expected to:	(A) define and discuss extra-operational requirements, including pre-flight inspection and mission plan;	Ground Control Stations & FPV: Mission Planning & 3D Modeling/Mapping
(7) The student understands the rules and regulations on operational limitations in certain airspaces. The student is expected to:	(B) identify geographical locations subject to extra operational requirements such as the use of a visual observer or airspace restrictions;	Airspace Classifications & Operating Requirements: Notices to Airmen & Temporary Flight Restrictions
(7) The student understands the rules and regulations on operational limitations in certain airspaces. The student is expected to:	(C) explain the differences between prohibited or restricted areas of UAV operation;	Airspace Classifications & Operating Requirements: Notices to Airmen & Temporary Flight Restrictions

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(7) The student understands the rules and regulations on operational limitations in certain airspaces. The student is expected to:	(D) compare the differences between class A, B, C, D, and G air space; and	Airspace Classifications & Operating Requirements: Aeronautical Sectional Charts & Classes of Airspace
(9) The student interprets inspection, maintenance, and airworthiness directives. The student is expected to:	(B) perform inspections and maintenance of common UAV systems; and	Maintenance & Inspection Procedures: Inspection Maintenance & Inspection Procedures: Maintenance
(10) The student analyzes responsible UAV operator provisions. The student is expected to:	(A) discuss careless operation and methods to prevent careless operation; and	Pathway to Certification: A Closer Look at Part 107 Certification
(10) The student analyzes responsible UAV operator provisions. The student is expected to:	(B) explain restrictions on UAV operators, including the prohibition on drug and alcohol usage by UAV operators.	Regulations & Operating Rules: Hazardous Operations & Change of Address
(11) The student analyzes the effects of weather on small unmanned aircraft performance. The student is expected to:	(A) explain the concepts of visibility, ceiling, and density altitude as they relate to UAV operation;	Aviation Weather, Effects & Sources: METARs & TAFs
(11) The student analyzes the effects of weather on small unmanned aircraft performance. The student is expected to:	(B) define atmospheric stability and describe its impact on UAV operation;	Aviation Weather, Effects & Sources: Weather Briefs & Stable Vs. Unstable Air
(11) The student analyzes the effects of weather on small unmanned aircraft performance. The student is expected to:	(C) discuss the effects of and determine best practices when encountering weather conditions such as clouds, fronts, tornadoes, icing, hail, lightning, fog, and thunderstorms on UAVs;	Aviation Weather, Effects & Sources: Wind, Friction, Masses, Fronts & Weather Formations
(11) The student analyzes the effects of weather on small unmanned aircraft performance. The student is expected to:	(D) identify and explain the potential effects of structural icing on operational components; and	Aviation Weather, Effects & Sources: Wind, Friction, Masses, Fronts & Weather Formations
(11) The student analyzes the effects of weather on small unmanned aircraft performance. The student is expected to:	(E) interpret measurements of atmospheric pressure and temperature/dew point.	Aviation Weather, Effects & Sources: METARs & TAFs
(12) The student applies standard radio communication procedures. The student is expected to:	(A) explain and employ the North Atlantic Treaty Organization (NATO) phonetic alphabet;	Radio Communications: Proper Radio Procedures
(12) The student applies standard radio communication procedures. The student is expected to:	(B) monitor manned aircraft communications via the common traffic advisory frequency;	Radio Communications: Proper Radio Procedures
(12) The student applies standard radio communication procedures. The student is expected to:	(C) operate the automatic terminal information service;	Radio Communications: Proper Radio Procedures
(12) The student applies standard radio communication procedures. The student is expected to:	(D) propose traffic advisory procedures for manned aircraft pilots, such as self-announcing or position and intentions; and	Radio Communications: Chart Supplements, Sectional Chart Frequencies & Making Reports
(12) The student applies standard radio communication procedures. The student is expected to:	(E) distinguish between airport radio communication procedures when operating with and without a control tower.	Radio Communications: Proper Radio Procedures