Arizona CTE

# CAVIT Drone Technology Program

| | |
|---|---|
| **Describe the major types, groups, and categories of UAS** DT1.0 | **1.1** Explain the term Unmanned Aircraft System DT1.1 |
| | **1.2** Explain the changing view on UAS DT1.2 |
| | **1.3** Explain the evolution of commercial UAS operations in the United States DT.1.3 |
| | **1.4** Identify the major challenges facing the UAS industry DT1.4 |
| | **1.5** Explain UAS component reliability and operational considerations DT1.5 |
| **Recall key aspects of the UAS flight approval and authorization process** DT2.0 | **2.1** Explain how the FAA enforces regulations and minimum standards DT2.1 |
| | **2.2** Explain how the FAA regulates aircraft, airmen, and airspace DT2.2 |
| | **2.3** Explain what is the National Airspace System (NAS) DT2.3 |
| | **2.4** Explain what are the regulatory limits on UAS DT2.4 |
| **Recognize legal and ethical considerations for specific types of UAS operations** DT3.0 | **3.1** Explain the regulations and policies currently in place for UAS operations DT3.1 |
| | **3.2** Explain Federal Aviation Regulations (FAR) DT3.2 |
| | **3.3** Explain the limitations and requirements of Visual Flight Rules (VFR) DT3.3 |
| | **3.4** Explain state and local rules and regulations governing UAS DT3.4 |
| | **3.5** Define professionalism and ethics DT3.5 |
| | **3.6** Describe the foundations of an ethical code of conduct for UAS operators DT3. |
| | **3.7** Explain standards of practice for UAS professionals DT3.7 |
| | **3.8** Identify the top ethical issues facing sUAS remote pilots PT3.8 |
| | **3.9** Examine case studies and make judgments about the ethical and professional use of UAS technology PT3.9 |
| | **3.10** Explain standards of profession and how to apply professionalism in everyday operations PT3.10 |

| | |
|---|---|
| **List the primary types of sensors used for data collection** DT4.0 | **4.1** Explain the field of robotics and the subset of aerial robots DT4.1 |
| | **4.2** Identify common components of unmanned aircraft DT4.2 |
| **Compare and contrast types of detect, sense, and avoid systems** DT5.0 | **5.1** Explain energy sources available for UAS DT5.1 |
| | **5.2** Explain how robotic aircraft maneuver and navigate DT5.2 |
| **Differentiate the various levels of UAS Automation and Autonomy** DT6.0 | **6.1** Explain aircraft capabilities and limitations associated with different platform categories DT6.1 |
| | **6.2** Explain UA aerodynamic principles and performance factors DT6.2 |
| **Demonstrate proper UAS safety procedures** DT7.0 | **7.1** Explain various airspace that drones operate inside of DT7.1 |
| | **7.2** Explain the classes of airspace DT7.2 |
| | **7.3** Explain Notices to Airmen information reporting system DT7.3 |
| | **7.4** Describe the types and causes of human errors DT7.4 |
| | **7.5** Explain human limitations in perception, processing, and performance DT7.5 |
| | **7.6** Describe the physiological effects of drugs and alcohol DT7.6 |
| | **7.7** Explain the aspects of UAS design and operations that hinder or limit human function and cognition DT7.7 |
| | **7.8** Describe methods for dealing with automation and the lack of sensory cues DT7.8 |
| | **7.9** Examine the evolution of CRM as a control for error DT7.9 |
| | **7.10** Explain the purpose of CRM DT7.10 |
| | **7.11** Explain decision behaviors as a CRM skillset DT7.11 |
| | **7.12** Explain Situational Awareness (SA) DT7.12 |
| | **7.13** Identify and explain the need for standard communication DT7.13 |
| | **7.14** Explain non-technical skills that can improve the function and efficiency of a UAS crew DT7.14 |
| **Explain the basics of airplane systems and understanding of aerodynamic prinicples** DT8.0 | **8.1** Explain the four forces that act upon a UAS DT8.1 |
| | **8.2** Describe the six degrees of freedom. DT8.2 |

| | |
|---|---|
| **Identify necessary information about the environment in which the vehicle will be flown such as airport facilities, air traffic control services, communication procedures, and sources of flight information** DT9.0 | **9.1** Examine other elements that affect a UAS's operation DT9.1 |
| | **9.2** Describe aspects of the physical environment that pose a hazard to UAS DT9.2 |
| | **9.3** Explain the concepts of weather as they pertain to aviation DT9.3 |
| | **9.4** Explore official and unofficial sources of weather that can inform a remote pilot's preflight decisions DT9.4 |
| | **9.5** Interpret "official" sources of weather to make sound decisions DT9.5 |
| **Describe variable atmosphere and its effect on aircraft operations, how to maximize safety minimizing exposure to weather-related aviation hazards.** DT10.0 | **10.1** Interpret center NOTAMs DT10.1 |
| | **10.2** Explain aviation communications DT10.2 |
| | **10.3** Explain the essential information required in aviation communications DT10.3 |
| **Justify aircraft capabilities and limitations in terms of performance parameters** DT11.0 | **11.1** Describe how stabilization, control, and power can be manipulated to fly a UAS DT11.1 |
| | **11.2** Describe the aerodynamic principles that affect UAS performance. DT11.2 |
| | **11.3** Explain the effects of weather, temperature, and system weight on unmanned aircraft performance DT11.3 |
| | **11.4** Explain the differences in rotor and fixed-wing aerodynamics DT11.4 |
| **Execute the basics of navigation using charts and radio aids** DT12.0 | **12.1** Interpret aeronautical charts to determine airspace for a given location DT12.1 |
| | **12.2** Explain the Aeronautical Information Manual to make a radio call DT12.2 |
| | **12.3** Explain airport operations and Traffic-pattern protocols DT12.3 |
| | **12.4** Explain UAS limitations and regulations DT12.4 |
| | **12.5** Explain the reporting requirements for UAS operations DT12.5 |
| **Demonstrate the application of aeronautical decision-making principles and flight-related physiological factors.** DT13.0 | **13.1** Define aeronautical decision-making DT13.1 |
| | **13.2** Examine the steps for sound aeronautical decision-making DT13.2 |
| | **13.3** Identify hazards associated with UAS operations DT13.3 |
| | **13.4** Explain various models for decision-making DT13.4 |

| | |
|---|---|
| | **13.5** Apply good aeronautical decision-making DT13.5 |
| | **13.6** Describe strategies for dealing with task saturation or overloads DT13.6 |
| | **13.7** Demonstrate the ability to think independently while exercising adaptability to stressful situations DT13.7 |
| | **13.8** Explain airworthiness inspections DT13.8 |
| **Perform Drafting Task** DT14.0 | **14.1** Make freehand sketches (e.g., line weights, hidden lines, center lines, and dimensioning) DT14.1 |
| | **14.2** Make CAD representations from freehand sketches DT14.2 |
| | **14.3** Determine shapes and sizes of surfaces from alternative views (e.g., orthographic, projection view, first angle projection, and third angle projection) DT14.3 |
| | **14.4** Make CAD drawings using geometric construction techniques DT14.4 |
| | **14.5** Make dimensional CAD drawings (e.g., 2D and 3D) DT14.5 |
| | **14.6** Explain basic knowledge of geometric dimensioning and tolerancing DT14.6 |
| | **14.7** Interpret unmanned aircraft system (e.g Drone Body and controller) plans DT14.7 |