Arizona CTE

# AIR TRANSPORTATION 49.0100.00 DRONE TECHNOLOGY

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| **DEMONSTRATE AN UNDERSTANDING OF THE HISTORY AND GROWTH OF THE AEROSPACE INDUSTRY** DT 1.0 | **1.1** Discuss the birth of flight, including aviation's early pioneers DT 1.1 |
| | **1.2** Understand the historical factors influencing the growth of aviation DT 1.2 |
| | **1.3** Discuss the role of government in the growth and development of aviation DT 1.3 |
| | **1.4** Understand the current challenges and opportunities in the further development of aviation DT 1.4 |
| **DEMONSTRATE THE UNDERSTANDING OF FUNDAMENTALS OF FLIGHT** DT 2.0 | **2.1** State and give examples of the application of flight (e.g., Newton's laws of motion, Bernoulli's principle, and Venturi effect) DT 2.1 |
| | **2.2** Name and compare the four forces of flight (i.e., weight, lift, drag, thrust, etc.) DT 2.2 |
| | **2.3** Identify the function and parts of an airfoil, including flight control surfaces (e.g., leading edge, trailing edge, chord, and upper and lower camber) DT 2.3 |
| | **2.4** Identify specific aircraft handling characteristics DT 2.4 |
| **DEMONSTRATE AN UNDERSTANDING OF FEDERAL AVIATION REGULATIONS (FAR) AND OTHER REQUIREMENTS** DT 3.0 | **3.1** Define acronyms and terms most frequently used for reference documents and in pilot/controller communications [e.g., those listed in the CFR (Code of Federal Regulation), AIM (Aeronautical Information Manual), and the Lexicon of the ICAO (International Civil Aviation Organization)] DT 3.1 |
| | **3.2** Describe the general content of section and parts of the CFR that pertain to the aviation industry [ref. 14 CFR Section A, Parts 1, 43, 61, 65, 67, 91, and 121; NTSB (National Transportation Safety Board) Part 830; and 49 CFR 1552-TSA (Transportation Safety Administration) Regulations)] DT 3.2 |

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| | **3.3** Explain Aircraft Certificates and Documents, their operating limitations, placards, and markings, including the medical certificate class and duration (e.g., Certificate of Airworthiness, Certificate of Registration, Journey Log, Pilot Operating Handbook, Pilot License, Radio Operator's License, Interception Signals, and Weight and Balance Report ) DT 3.3 |
| | **3.4** Explain airworthiness requirements (e.g., day and night Visual Flight Rules, airworthiness compliance records, and airworthiness with inoperative instruments and equipment) DT 3.4 |
| | **3.5** List the general eligibility requirements for a private pilot certificate (ref. 14 CFR/FAR 61.103) DT 3.5 |
| | **3.6** Compare and contrast requirements for a private pilot certificate with requirements for other pilot certificates and ratings (i.e., student, sport, recreational, instrument, commercial, type, airline transport pilot certificates, etc.) DT 3.6 |
| | **3.7** Identify and describe required documents that an airman must present for inspection upon reasonable, authorized requests (i.e., airman certificate, medical certificate, aircraft records, airworthiness documentation, etc.) DT 3.7 |
| **DEMONSTRATE AN UNDERSTANDING OF AIRFRAME AND POWERPLANT SYSTEMS** DT 4.0 | **4.1** Describe and identify powerplant components and the theory of operation DT 4.1 |
| | **4.2** Describe a basic cooling system, its equipment operations and possible malfunctions DT 4.2 |
| | **4.3** Describe various aircraft fuel systems, their equipment operations and possible malfunctions DT 4.3 |
| | **4.4** Demonstrate an understanding of basic electricity as it applies to various aircraft electrical systems DT 4.4 |
| | **4.5** Describe a basic lubrication system, its equipment operations and possible malfunctions DT 4.5 |
| | **4.6** Describe basic aircraft pneudraulics systems, their equipment operations and possible malfunctions DT 4.6 |
| | **4.7** Demonstrate basic operation of an aircraft engine, including proper interpretation of engine instruments DT 4.7 |
| **DEMONSTRATE AN UNDERSTANDING OF AEROSPACE NAVIGATIONAL SYSTEMS AND PROCEDURES** DT 5.0 | **5.1** Define basic navigational concepts (e.g., pilotage, dead reckoning, and radio navigation) DT 5.1 |
| | **5.2** Describe and demonstrate VOR and ADF equipment and navigation DT 5.2 |
| | **5.3** Describe and demonstrate GPS equipment and operations DT 5.3 |

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| | **5.4** Understand RNAV principles DT 5.4 |
| | **5.5** Understand the use of various flight planning computers DT 5.5 |
| | **5.6** Explain sectional charts and their use and the use of PDAs for electronic replacement DT 5.6 |
| | **5.7** Explain en-route and terminal approach and departure procedures DT 5.7 |
| | **5.8** Explain emergency procedures for lost communications DT 5.8 |
| | **5.9** Discuss and interpret aircraft performance DT 5.9 |
| | **5.10** Plan and demonstrate a cross-country flight DT 5.10 |
| | **5.11** Apply understanding of the national airspace system DT 5.11 |
| **DEMONSTRATE AN UNDERSTANDING OF AIRPORT OPERATIONS AND MANAGEMENT** DT 6.0 | **6.1** Understand the airport as a system of integrated components and operations DT 6.1 |
| | **6.2** Understand airport flight and ground operations, including airport and runway signs, markings, and lighting DT 6.2 |
| | **6.3** Demonstrate an understanding of how to improve runway incursion avoidance and detection capabilities DT 6.3 |
| | **6.4** Understand airport support systems and function (e.g., air traffic control, security, aircraft support, terminal management, and information systems) DT 6.4 |
| | **6.5** Use and explain aircraft voice communications equipment and proper phraseology in ATC communications, including phonetic alphabet DT 6.5 |
| **DEMONSTRATE SAFETY IN AVIATION** DT 7.0 | **7.1** Apply safety to aircraft ground handling operations DT 7.1 |
| | **7.2** Understand shop safety considerations [FOD, tool accountability (usage, calibration, maintenance, storage), PPE, and hazmat] DT 7.2 |
| | **7.3** Understand principles of flight safety (air and ground operations) DT 7.3 |
| **DEMONSTRATE AN UNDERSTANDING OF AVIATION METEOROLOGY** DT 8.0 | **8.1** Demonstrate an understanding of weather theory DT 8.1 |
| | **8.2** Demonstrate an understanding of weather hazards and how to deal with them DT 8.2 |
| | **8.3** Demonstrate the ability to access and analyze weather reports, charts, and forecasts from various sources DT 8.3 |

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| **DEMONSTRATE FLIGHT PLANNING SKILLS** DT 9.0 | **9.1** Understand and demonstrate weight and balance theory and calculations DT 9.1 |
| | **9.2** Demonstrate flight planning procedures (e.g., route, weather, fuel, airports, NOTAMS, flightlog, and post-flight operations) DT 9.2 |
| | **9.3** Demonstrate understanding of aircraft performance and limitations (e.g., use of charts, tables, and data to determine performance; and effects of atmospheric conditions on aircraft performance) DT 9.3 |
| | **9.4** Demonstrate understanding of VFR/IFR flight plans DT 9.4 |
| **DEMONSTRATE AN UNDERSTANDING OF HUMAN FACTORS** DT 10.0 | **10.1** Understand concepts of CRM (Crew Resources Management) DT 10.1 |
| | **10.2** Demonstrate situation awareness DT 10.2 |
| | **10.3** Demonstrate correct ADM (Aeronautical Decision Making) skills DT 10.3 |
| | **10.4** Understand basic aviation physiology (e.g., symptoms, causes, effects, and corrective actions for hypoxia, hyperventilation, middle ear, and sinus problems; spatial disorientation, motion sickness, carbon monoxide poisoning, stress and fatigue, and dehydration; and physiological aspects of night flying, light systems, night orientation, and night illusions) DT 10.4 |