



Aviation I

Course Number	
Grade Level	8-12
Career Cluster	Supply Chain & Transportation
Pathway	Aviation
Course Sequence	Introduction to Aviation
CTSO	SkillsUSA
Industry Recognized Credential	Industry Recognized Credential
Minimum Equipment List	Minimum Equipment
Course Description	

CIP Codes	CIP Title
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician
49.0102	Airline/Commercial/Professional Pilot and Flight Crew

SOC Codes	SOC Title
53-2011	Airline Pilots, Copilots, and Flight Engineers
49-2091	Avionics Technicians



Course Standards

Domain 1.0 Advanced Aerodynamics & Aircraft Performance	
Standard 1.1 Explore Aerodynamics Beyond the Basics.	
Performance Indicators	
1.1.1	Understand the components and use of the lift equation and the drag equation.
1.1.2	Describe induced and parasite drag and their impact on performance.
1.1.3	Compare airflow over fixed wings vs. multirotor lift generation.
1.1.4	Explain the angle of attack and how exceeding critical angle of attack causes a stall.
1.1.5	Identify and explain how weight and balance affect aircraft controllability and stall risk.
1.1.6	Calculate center of gravity (CG) and evaluate whether an aircraft is within safe operational limits.



1.1.7	Describe how density altitude impacts aircraft performance.
Standard 1.2 Explain small aircraft flight control systems and mechanical linkage.	
Performance Indicators	
1.2.1	Identify aileron, elevator, rudder, and trim functions.
1.2.2	Compare mechanical vs. fly-by-wire systems.
1.2.3	Interpret how control surfaces influence pitch, roll, and yaw.
1.2.4	Demonstrate control input logic using simulators or RC trainers.
Standard 1.3 Examine Aircraft Design & Flight Characteristics.	
Performance Indicators	
1.3.1	Identify major aircraft structural components (e.g., fuselage, wing, empennage, landing gear) and describe their purpose.
1.3.2	Explain how wing shape, aspect ratio, and camber impact lift and glide characteristics.
1.3.3	Compare fixed-wing, rotary, and multirotor configurations and explain the advantages and limitations of each.



1.3.4	Understand how design modifications affect performance outcomes.
Domain 2.0 Unmanned Aerial Systems, Components, & Mission Configuration	
Standard 2.1 Analyze Core Electrical & Propulsion Systems.	
Performance Indicators	
2.1.1	Identify major electrical components in a UAS including motors, electronic speed controllers, battery, power distribution board, and wiring harness.
2.1.2	Measure voltage and current draw and explain their relationship to battery life and flight time.
2.1.3	Calculate battery capacity requirements for mission duration using mAh, amp draw, and C-rating.
2.1.4	Configure ESC settings (startup tone, braking, throttle curve) using flight controller software.
2.1.5	Build or assemble a propulsion system (real or simulated) to meet a specific mission requirement.
Standard 2.2 Discuss Unmanned Aerial System Sensors & Avionics.	
Performance Indicators	



2.2.1	Identify primary sensors including inertial measurement unit, Global Positioning System, accelerometer, gyroscope, magnetometer, and barometer.
2.2.2	Demonstrate how GPS positioning enables return to home, waypoint flight, and geofencing.
2.2.3	Explain the difference between first-person view analog and digital video transmission systems.
2.2.4	Configure failsafe settings including RTH altitude, signal loss response, and battery reserve triggers.
2.2.5	Evaluate how sensor limitations affect mission reliability in urban, indoor, or GPS-denied environments.
Standard 2.3 Evaluate Ground Control Systems & Telemetry.	
Performance Indicators	
2.3.1	Identify transmitter components including gimbals, antenna, switches, and display interface.
2.3.2	Explain how radio protocols (2.4 GHz, 900 MHz, Wi-Fi link, Bluetooth) affect range and penetration.
2.3.3	Use a Ground Control Station (e.g., Q Ground Control / Mission Planner) for waypoint planning.
2.3.4	Evaluate mission telemetry post-flight to determine efficiency, stability, and control response.



Domain 3.0 Regulations, Airspace, & Remote Pilot Responsibilities	
Standard 3.1 Clarify Part 107 Regulations.	
Performance Indicators	
3.1.1	Identify Part 107 eligibility requirements.
3.1.2	Interpret controlled airspace classifications for drone operations.
3.1.3	Explain the difference between recreational, commercial, and public use.
3.1.4	Analyze scenarios to determine legal vs. illegal flight operations.
Standard 3.2 Discuss Airspace Classification & Operating Requirements.	
Performance Indicators	
3.2.1	Interpret sectional charts relevant to small aircraft and UAS operations.
3.2.2	Demonstrate radio communication procedure awareness (monitoring air traffic control when required).
3.2.3	Identify Class B, C, D, E, and G airspace boundaries and floor/ceiling altitudes.



3.2.4	Locate airports, radio frequencies, and common traffic advisory frequency markings.
3.2.5	Measure latitude/longitude and plan flight paths accordingly.
3.2.6	Request Low Altitude Authorization and Notification Capability authorization for controlled zone flight.
Standard 3.3 Examine Operational Waivers, Privacy & Legal Compliance.	
Performance Indicators	
3.3.1	Identify FAA operations that require a waiver (night flight, over people, beyond visual line of sight, etc.).
3.3.2	Explain the difference between Part 107 regulatory authority, advisory circulars, and local/state laws.
3.3.3	Identify penalties for unauthorized flight, reckless operations, or breaching privacy boundaries.
3.3.4	Demonstrate operational compliance by planning a flight that avoids people, private property, and restricted zones.
Domain 4.0 Aviation Weather for Small Aircraft and UAS Operations	
Standard 4.1 Describe Weather Theory for Small Aircraft.	
Performance Indicators	



4.1.1	Explain density altitude and its effects on aircraft lift/engine performance.
4.1.2	Prepare flight plans including route, altitude, weather, and fuel/endurance projections.
4.1.3	Identify and use official weather sites as well as digital flight-planning tools (e.g., 1800wxbrief, aviationweather.gov, UAV Forecast, Fore-Flight).
Standard 4.2	
Explore Weather Report and Forecast Interpretation and Weather Risk Management for UAS Missions.	
Performance Indicators	
4.2.1	Understand the difference between weather reports and weather forecast.
4.2.2	Identify different official weather reports and where to find them.
4.2.3	Identify different weather forecasts and where to find them.
4.2.4	Decode Meteorological Aerodrome Report and Terminal Aerodrome Forecast for operational decision-making.
4.2.5	Evaluate crosswind, gust factors, and visibility requirements for safe launch.
4.2.6	Predict turbulence, downdraft, icing, and convective activity risks.



Domain 5.0
Human Factors and Crew Management

Standard 5.1

Outline limitations and performance issues in aviation.

Performance Indicators

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| 5.1.1 | Describe how fatigue, stress, dehydration, and illness degrade decision-making and reaction time. |
| 5.1.2 | Identify visual illusions, spatial disorientation, and overreliance on automation. |
| 5.1.3 | Explain the IM SAFE checklist and apply it to personal fitness for flight. |
| 5.1.4 | Analyze flight incidents where human error contributed to system failure. |
| 5.1.5 | Demonstrate strategies to mitigate stress and workload during missions. |

Standard 5.2

Illustrate Crew Resource Management & Team Coordination.

Performance Indicators



5.2.1	Identify CRM principles including communication, leadership, and workload distribution.
5.2.2	Understand responsibilities of individual crew roles such as pilot, visual observer, payload operator, and mission commander.
5.2.3	Conduct a preflight crew briefing outlining mission objectives, risks, and contingencies.
5.2.4	Identify common military aircraft and their missions.
5.2.5	Evaluate task delegation efficiency to reduce pilot overload.
Standard 5.3 Clarify Operational Judgement, Risk Assessment & Decision-Making.	
Performance Indicators	
5.3.1	Explain the purpose of charts in flight planning.
5.3.2	Identify basic symbols on sectional charts.
5.3.3	Locate airports, runways, and landmarks using charts.
5.3.4	Analyze historical accident reports to identify root causes in judgment or CRM failure.
Standard 5.4	



Explain Safety Culture, Professional Conduct & Ethical Flight Operation.	
Performance Indicators	
5.4.1	Explain why safety culture is foundational for both manned and UAS aviation operations.
5.4.2	Demonstrate professional communication with crew, bystanders, and authorities.
5.4.3	Compare real ethical concerns: privacy rights, surveillance use, public flight perception, etc.
5.4.4	Demonstrate respect for community, property, and airspace rules during field operations.

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