



Aviation II Mechanics

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 Aviation Safety, Regulations & Professional Practice	
Standard 1.1 Explore Advanced Federal Aviation Administration Regulations & Certification Pathways.	
Performance Indicators	
1.1.1	Identify FAA certificate types.
1.1.2	Distinguish between FAR Parts 43, 61, 65, 91, and 145 and their applications.
1.1.3	Understand and demonstrate proper aircraft and engine inspection procedures
1.1.4	Explain eligibility and training pathways for Airframe and Powerplant certification.
1.1.5	Interpret mechanic logbooks for currency, compliance, and training documentation.
1.1.6	Explain Transportation Security Administration requirements related to flight training and aircraft security.



1.1.7	Analyze how regulatory non-compliance affects safety, certification, and employment.
1.1.8	Compare fixed-wing and rotorcraft maintenance considerations.
Standard 1.2 Discuss Safety Management Systems (SMS) Risk Analysis.	
Performance Indicators	
1.2.1	Define Safety Management Systems (SMS) and its four components.
1.2.2	Identify hazards related to flight operations, maintenance activities, and human performance.
1.2.3	Apply FAA-approved risk management models (e.g., Pilot, Aircraft, Environment, External pressure, 3P-Perceive hazards, Process risk, Perform mitigation, SRM-Single-Pilot Resource Management).
1.2.4	Analyze accident and incident reports to identify root causes.
1.2.5	Demonstrate safety reporting procedures and documentation standards.
1.2.6	Explain the role of safety culture in aviation organizations.
Standard 1.3 Clarify Professional Ethics & Aviation Career Readiness.	
Performance Indicators	



1.3.1	Explain ethical responsibilities of maintenance technicians.
1.3.2	Describe professional standards for decision authority and accountability.
1.3.3	Demonstrate proper professional communication in aviation environments.
1.3.4	Analyze ethical dilemmas involving safety vs. operational pressure.
1.3.5	Identify postsecondary training pathways, certifications, and apprenticeships.
1.3.6	Explain the importance of continuous training and recurrency.
1.3.7	Evaluate how professionalism impacts public trust and aviation safety.
Domain 2.0 Aircraft Structures & Materials	
Standard 2.1 Analyze Aircraft Structures & Stress Analysis.	
Performance Indicators	
2.1.1	Identify primary aircraft structural components and their functions.



2.1.2	Explain stress types including tension, compression, shear, bending, and torsion.
2.1.3	Analyze load paths through wings, fuselage, and empennage.
2.1.4	Distinguish between truss, monocoque, and semi-monocoque structures.
2.1.5	Evaluate structural damage scenarios and safety implications.
2.1.6	Interpret structural repair manuals and diagrams.
Standard 2.2 Discuss Metals, Non-metals, Composites.	
Performance Indicators	
2.2.1	Identify common aircraft metals including aluminum alloys, steel, and titanium.
2.2.2	Identify wood and fabric aircraft construction methods.
2.2.3	Compare composite materials such as fiberglass, carbon fiber, and honeycomb.
2.2.4	Explain material selection based on strength-to-weight ratio.



2.2.5	Identify corrosion types including galvanic, pitting, and intergranular.
2.2.6	Demonstrate corrosion prevention and inspection techniques.
2.2.7	Analyze material fatigue and service life limitations.
Standard 2.3 Discuss Hardware, Fasteners & Repairs.	
Performance Indicators	
2.3.1	Identify aircraft hardware including bolts, nuts, rivets, and safety wire.
2.3.2	Distinguish between Army-Navy, National Aerospace Standards, and Military Standard fasteners.
2.3.3	Demonstrate proper torque application and safety methods.
2.3.4	Evaluate acceptable vs. unacceptable fastener installations.
2.3.5	Interpret maintenance manuals for approved repair methods.
2.3.6	Explain the consequences of improper fastening or repair.



**Domain 3.0
Powerplant Systems**

Standard 3.1

Examine Reciprocating Engines.

Performance Indicators

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|-------|---|
| 3.1.1 | Identify major components of a reciprocating aircraft engine. |
| 3.1.2 | Explain four-stroke engine operation. |
| 3.1.3 | Describe lubrication and cooling systems. |
| 3.1.4 | Analyze common engine malfunctions and causes. |
| 3.1.5 | Interpret engine performance indicators. |
| 3.1.6 | Explain inspection and maintenance intervals. |

Standard 3.2

Evaluate Turbine Engines.

Performance Indicators

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|-------|---|
| 3.2.1 | Identify components of turbojet, turbofan, turboprop, and turboshaft engines. |
| 3.2.2 | Explain turbine engine operating principles. |



3.2.3	Compare turbine and piston engine advantages and limitations.
3.2.4	Identify turbine engine hazards and safety procedures.
3.2.5	Analyze basic turbine performance data.
Standard 3.3 Discuss Propellers & Engine Controls.	
Performance Indicators	
3.3.1	Identify fixed-pitch and constant-speed propeller components.
3.3.2	Explain blade angle and thrust generation.
3.3.3	Describe propeller governor operation.
3.3.4	Analyze common propeller defects and damage.
3.3.5	Explain engine control linkages and cockpit interfaces.
Domain 4.0 Aircraft Systems & Avionics	
Standard 4.1 Examine Fuel, Induction & Exhaust Systems.	



Performance Indicators	
4.1.1	Identify fuel system components and layouts.
4.1.2	Explain carburetion and fuel injection systems.
4.1.3	Analyze fuel contamination risks and detection methods.
4.1.4	Explain exhaust system design and hazards.
4.1.5	Describe induction system icing and prevention.
Standard 4.2 Interpret Electrical Power & Ignition Systems.	
Performance Indicators	
4.2.1	Identify aircraft electrical system components.
4.2.2	Explain Direct Current power generation and regulation.
4.2.3	Analyze ignition system operation and redundancy.
4.2.4	Interpret electrical schematics.



4.2.5	Identify electrical faults and safety concerns.
Standard 4.3 Clarify Basic Avionics & Instrument Systems.	
Performance Indicators	
4.3.1	Identify pitot-static instruments and operating principles.
4.3.2	Explain gyroscopic instrument operation.
4.3.3	Compare analog and glass cockpit systems.
4.3.4	Identify avionics cooling and power requirements.
4.3.5	Analyze instrument failure modes.
Standard 4.4 Analyze Flight Controls and Rigging.	
Performance Indicators	
4.4.1	Identify primary and secondary flight control systems.



4.4.2	Explain rigging, balancing, and cable tension requirements.
4.4.3	Inspect control surfaces for airworthiness.
Standard 4.5 Describe Landing Gear Systems.	
Performance Indicators	
4.5.1	Describe fixed and retractable landing gear systems.
4.5.2	Explain brake, tire, and steering systems.
4.5.3	Inspect landing gear for wear and damage.
Standard 4.6 Interpret Hydraulic and Pneumatic Systems.	
Performance Indicators	
4.6.1	Explain hydraulic power generation and components.



4.6.2	Identify pneumatic system applications.
4.6.3	Inspect systems for leaks, contamination, and failures.
Standard 4.7 Outline Environmental, Oxygen, and Cabin Systems.	
Performance Indicators	
4.7.1	Explain cabin heating and cooling systems.
4.7.2	Describe oxygen system components and safety.
4.7.3	Analyze pressurization fundamentals.
Domain 5.0 Maintenance Practices, Regulations & Safety	
Standard 5.1 Discuss FAA Regulations (Part 43, 65, 145).	
Performance Indicators	
5.1.1	Explain maintenance privileges and limitations.



5.1.2	Identify required inspections and intervals.
5.1.3	Interpret approved data and maintenance documentation.
5.1.4	Analyze consequences of improper maintenance.
Standard 5.2 Illustrate Maintenance Documentation & Log books.	
Performance Indicators	
5.2.1	Identify required logbook entries.
5.2.2	Complete sample maintenance log entries.
5.2.3	Explain airworthiness determination.
5.2.4	Evaluate documentation for compliance.
Standard 5.3 Explore Tool Use, Inspection & Safety Procedures.	



Performance Indicators	
5.3.1	Identify and properly use common aircraft maintenance tools.
5.3.2	Demonstrate inspection techniques.
5.3.3	Explain personal and aircraft safety procedures.
5.3.4	Identify Foreign Object Debris hazards and prevention methods.
5.3.5	Demonstrate proper shop safety and organization.
Domain 6.0 FAA Aircraft Mechanic Knowledge Test Preparation	
Standard 6.1 Evaluate FAA Aircraft Mechanic Exam.	
Performance Indicators	
6.1.1	Identify all FAA Airframe & Powerplant knowledge test subject areas.
6.1.2	Analyze Airman Certification Standards task elements and learning objectives.



6.1.3	Analyze and apply strategies tailored to the structure and wording of FAA knowledge tests.
Standard 6.2 Discuss Logbook, Endorsements & Written Exam Completion.	
Performance Indicators	
6.2.1	Explain instructor endorsement requirements for FAA testing.
6.2.2	Maintain accurate training documentation records.

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