IGNITE YOUR POTENTIAL 2024-2025

NYS SkillsUSA Standards

# AVIATION MAINTENANCE TECHNOLOGY

## PURPOSE

To evaluate each competitor's preparation for employment and to recognize outstanding students for excellence and professionalism in the field of aviation maintenance technology.

## ELIGIBILITY

Open to active SkillsUSA members enrolled in programs with aviation maintenance technology as the occupational objective.

## CLOTHING REQUIREMENT

**NYS SkillsUSA – Mechanic**

- White crew neck short- sleeved T-shirt
- Work pants or jeans,
- Leather or steel toed work shoes.
- Long hair must be restrained.
- Safety glasses with side shields or goggles, (Prescription glasses can be used only if they are equipped with side shields and approved by OSHA(Z-87). If not, they must be covered with goggles.)

Note: Contestants must wear their official contest clothing to the contest orientation meeting.
Also bring #2 pencil, resume, and safety assurance form.

# EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
   a. All necessary tools and equipment for the competition
   b. All necessary information and furnishings for judges and technical committees
2. Supplied by the competitor:
   a. Calculator (nonprogrammable)
   b. All competitors must create a one-page resume. See "Resume Requirement" below for guidelines.
   c. Ear plugs
   d. Safety glasses

## RESUME REQUIREMENT

Competitors must create a one-page resume to submit at orientation.

## DEVICES

Cell phones or other electronic devices not approved by the NYS Chairperson will be collected by the contest chair during the competition. Chairpersons will announce their acceptance by listing it on their standard or at the orientation meeting. In case of emergencies advisors should allow the competitors to take their phones to the contest areas.

If the competitor uses their device in a manner which compromises the integrity of the competition, the competitor's score may be penalized.

# SCOPE OF THE COMPETITION

The competition will be consistent with the airframe and powerplant mechanics certification guide published by the Department of Transportation Federal Aviation Administration Advisory Circular EA-AC 65-2D [Amdt. 147–2, 35 FR 5535, April 3, 1970, as amended by Amdt. 147–5, 57 FR 28960, June 29, 1992] and Sec. 6(c), Dept. of Transportation Act; 49 U.S.C. 1655(c) [Amdt. 147–2, 35 FR 5535, April 3, 1970, as amended by Amdt. 147–5, 57 FR 28961, June 29, 1992].

The high-school competition will cover the competencies classified as general aviation by the FAA.

The college/postsecondary competition will cover those competencies classified as power plant and airframe by the FAA.

## KNOWLEDGE PERFORMANCE

All competitors are required to take the SkillsUSA professional development test at orientation.

The competition will include a written knowledge test assessing general knowledge of aviation maintenance technology. Definitions, knowledge, processes, and procedures relevant to aviation maintenance technology will be assessed.

## SKILLPERFORMANCE

The competition will include a series of operations. Eight to 15 operations will be assigned; each operation must be broken down into specific criteria and points assigned based on the task's difficulty.

## COMPETITION GUIDELINES

1. Tasks assigned to a competitor will not have a set time limit or sequence.
2. The following shop safety rules will be followed:
   a. Safety glasses must be used
   b. No loose clothing is permitted
   c. Long hair must be tied behind the head and netted or worn under a cap
   d. No jewelry will be allowed

## STANDARDS AND COMPETENCIES (HIGH SCHOOL COMPETITION)

### AMT 1.0 — Apply knowledge of basic aviation electricity to FAA general aviation competencies

1.1. Calculate and measure capacitance and inductance
1.2. Calculate and measure electrical power
1.3. Measure voltage, current, resistance and continuity
1.4. Determine the relationship of voltage, current and resistance in electrical circuits
1.5. Read and interpret aircraft electrical circuit diagrams including solid state devices and logic functions
1.6. Inspect and service batteries

**AMT 2.0 — Interpret aircraft drawings to FAA general aviation competencies**

2.1. Use aircraft drawings, symbols, and system schematics
2.2. Draw sketches of repairs and alterations
2.3. Use blueprint information
2.4. Use graphs and charts

**AMT 3.0 — Use weight and balance knowledge to FAA general aviation competencies**

3.1. Weigh aircraft
3.2. Perform complete weight-and-balance check and record data

**AMT4.0— Demonstrate the ability to install fluid lines/fittings to FAA general aviation competencies**

4.1. Fabricate and install rigid and flexible fluid lines and fittings

**AMT5.0—Demonstrate a knowledge ofmaterialsandprocessestoFAA general aviation competencies**

5.1. Identify and select appropriate nondestructive testing methods
5.2. Perform dye penetrant, eddy current, ultrasonic and magnetic particle inspections
5.3. Perform basic heat-treating processes
5.4. Identify and select aircraft hardware and materials
5.5. Inspect and check welds
5.6. Perform precision measurements

**AMT 6.0 — Demonstrate knowledge of ground operation and servicing to FAA general aviation competencies**

6.1. Start, ground operate, move, service and secure aircraft and identify typical ground operation hazards
6.2. Identify and select fuels

**AMT 7.0 — Demonstrate knowledge of cleaning and corrosion control to FAA general aviation competencies**

7.1. Identify and select cleaning materials
7.2. Inspect, identify, remove, and treat aircraft corrosion and perform aircraft cleaning

**AMT 8.0 — Demonstrate knowledge of mathematics to FAA general aviation competencies**

8.1. Extract roots and raise numbers to a given power
8.2. Determine areas and volumes of various geometrical shapes
8.3. Solve ratio, proportion, and percentage problem
8.4. Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers

**AMT 9.0 — Use maintenance forms and records to FAA general aviation competencies**

9.1. Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records
9.2. Complete required maintenance forms, records, and inspection reports

### AMT 10.0 — Recall knowledge of basic physics to FAA general aviation competencies

10.1. Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight

### AMT 11.0 — Use maintenance publications to FAA general aviation competencies

11.1. Demonstrate ability to read, comprehend and apply information contained in FAA and manufacturers' aircraft maintenance specifications, data sheets, manuals, publications, and related federal guidelines
11.2. Use aviation regulations, airworthiness directives, and advisory material
11.3. Read technical data

### AMT 12.0 — Explain mechanic privileges and limitations to FAA general aviation competencies

12.1. Exercise mechanic privileges within the limitations prescribed by Part 65 of this chapter

### AMT 13.0 — Demonstrate knowledge of job-related safety requirements to FAA general aviation competencies

13.1. Demonstrate proper application of job site and shop rules and regulations (OSHA)
13.2. Demonstrate correct selection and use of electrical and hand tools
13.3. Demonstrate proper techniques and practices for working on and around live equipment

## STANDARDS AND COMPETENCIES: AIRFRAME STRUCTURES, SYSTEMS AND COMPONENTS (COLLEGE/POSTSECONDARY COMPETITION)

### AMT 1.0 — Maintain wood structures to FAA power plant and airframe competencies

1.1. Service and repair wood structures
1.2. Identify wood defects
1.3. Inspect wood structures

### AMT 2.0 — Maintain aircraft covering to FAA power plant and airframe competencies

2.1. Select and apply fabric and fiberglass covering materials
2.2. Inspect, test and repair fabric and fiberglass

### AMT3.0— Maintain aircraft finishes to FAA powerplant and air frame competencies

3.1. Apply trim, letters, and touchup paint
3.2. Identify and select aircraft finishing materials
3.3. Apply finishing materials
3.4. Inspect finishes and identify defects

### AMT4.0—Maintain sheetmetalandnonmetallicstructurestoFAA powerplantand airframe competencies

4.1. Select, install, and remove special fasteners for metallic, bonded, and composite structures
4.2. Inspect bonded structures
4.3. Inspect, test and repair fiberglass, plastics, honeycomb, composite and laminated primary and secondary structures
4.4. Inspect, check, service and repair windows, doors, and interior furnishings
4.5. Inspect and repair sheet-metal structures
4.6. Install conventional rivets

4.7. Form, lay out and bend sheet metal

**AMT5.0—Demonstrate ability in aviation welding to FAA powerplant and airframe competencies**

5.1. Weld magnesium and titanium
5.2. Solder stainless steel
5.3. Fabricate tubular structures
5.4. Solder, braze, gas-weld and arc-weld steel
5.5. Weld aluminum and stainless steel

**AMT6.0—Demonstrate knowledge of assembly and rigging to FAA powerplant and airframe competencies**

6.1. Rig rotary-wing aircraft
6.2. Rig fixed-wing aircraft
6.3. Check alignment of structures
6.4. Assemble aircraft components, including flight control surfaces
6.5. Balance, rig and inspect movable primary and secondary flight control surfaces
6.6. Jack aircraft

**AMT7.0—Apply knowledge of airframe inspection to FAA powerplant and airframe competencies**

7.1. Perform airframe conformity and airworthiness inspections

**AMT8.0—Apply knowledge of aircraft landing gear systems to FAA powerplant and airframe competencies**

8.1. Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems

**AMT9.0—Apply knowledge of hydraulic and pneumatic Power Systems to FAA powerplant and airframe competencies**

9.1. Repair hydraulic and pneumatic power systems components
9.2. Identify and select hydraulic fluids
9.3. Inspect, check, service, troubleshoot and repair hydraulic and pneumatic power systems

**AMT10.0—Ability to apply knowledge of cabin atmosphere control systems to FAA power plant and airframe competencies**

10.1. Inspect, check, troubleshoot, service and repair heating, cooling, air conditioning and pressurization systems and air cycle machines
10.2. Inspect, check, troubleshoot, service and repair heating, cooling, air conditioning and pressurization systems
10.3. Inspect, check, troubleshoot, service and repair oxygen systems

**AMT11.0 — Apply knowledge of aircraft instrument systems to FAA powerplant and air frame competencies**

11.1. Inspect, check, service, troubleshoot and repair electronic flight instrument systems and both mechanical and electrical heading, speed, altitude, temperature, pressure, and position indicating systems to include the use of built-in test equipment
11.2. Install instruments and perform a static pressure system leak test

**AMT 12.0 — Apply knowledge of communication and navigation systems to FAA power plant and airframe competencies**

12.1. Inspect, check, and troubleshoot autopilot, service and approach coupling systems
12.2. Inspect, check and service aircraft electronic communication and navigation systems, including VHF passenger address interphones and static discharge devices, aircraft VOR, ILS, LORAN, radar beacon transponders, flight management computers, and GPWS
12.3. Inspect and repair antenna and electronic equipment installations

**AMT 13.0—Apply knowledge of aircraft fuel systems to FAA power plant and airframe competencies**

13.1. Check and service fuel dump systems
13.2. Perform fuel management transfer and defueling
13.3. Inspect, check, and repair pressure fueling systems
13.4. Repair aircraft fuel system components
13.5. Inspect and repair fluid quantity indicating systems
13.6. Troubleshoot, service and repair fluid pressure and temperature warning systems
13.7. Inspect, check, service, troubleshoot and repair aircraft fuel systems

**AMT14.0—Apply knowledge of aircraft electrical systems to FAA power plant and airframe competencies**

14.1. Repair and inspect aircraft electrical system components; crimp and splice wiring to manufacturers' specifications; and repair pins and sockets of aircraft connectors
14.2. Install, check and service airframe electrical wiring, controls, switches, indicators, and protective devices
14.3. Inspect, check, troubleshoot, service and repair alternating and direct current electrical systems
14.4. Inspect, check, and troubleshoot constant speed and integrated speed drive generators

**AMT 15.0—Apply knowledge of position and warning systems to FAA power plant and airframe competencies**

15.1. Inspect, check and service speed and configuration warning systems, electrical brake controls and anti-skid systems
15.2. Inspect, check, troubleshoot and service landing gear position indicating and warning systems

**AMT 16.0—Apply knowledge of ice and rain control systems to FAA power plant and airframe competencies**

16.1. Inspect, check, troubleshoot, service and repair airframe ice and rain control systems

**AMT 17.0—Apply knowledge of fire protection systems to FAA power plant and airframe competencies**

17.1. Inspect, check and service smoke and carbon monoxide detection systems
17.2. Inspect, check, service, troubleshoot and repair aircraft fire detection and extinguishing systems

**AMT 18.0 — Demonstrate knowledge of job-related safety requirements to FAA power plant and airframe competencies**

18.1. Demonstrate proper application of job site and shop rules and regulations (OSHA)
18.2. Demonstrate correct selection and use of electrical and hand tools
18.3. Demonstrate proper techniques and practices for working on and around live equipment

## STANDARDS AND COMPETENCIES: POWER PLANT THEORY, MAINTENANCE, SYSTEMS AND COMPONENTS (COLLEGE/POSTSECONDARY COMPETITION)

**AMT1.0—Apply knowledge of reciprocating engines to FAA powerplant and airframe competencies**

1.1. Inspect and repair a radial engine
1.2. Overhaul reciprocating engine
1.3. Inspect, check, service and repair reciprocating engines and engine installations
1.4. Install, troubleshoot, and remove reciprocating engines

**AMT2.0— Apply knowledge of turbine engines to FAA powerplant and airframe competencies**

2.1. Overhaul turbine engine
2.2. Inspect, check, service and repair turbine engines and turbine engine installations
2.3. Install, troubleshoot, and remove turbine engines

**AMT3.0—Apply knowledge of engine inspection to FAA power plant and airframe competencies**

3.1. Perform power plant conformity and air worthiness inspections

**AMT4.0— Demonstrate knowledge of engine instrument systems to FAA power plant and airframe competencies**

4.1. Troubleshoot, service and repair electrical and mechanical fluid rate-of-flow indicating systems
4.2. Inspect, check, service, troubleshoot and repair electrical and mechanical engine temperature, pressure and rpm indicating systems

**AMT5.0—Demonstrate knowledge of engine fire protection systems to FAA power plant and airframe competencies**

5.1. Inspect, check, service, troubleshoot and repair engine fire detection and extinguishing systems

**AMT 6.0 — Demonstrate knowledge of engine electrical systems to FAA powerplant and airframe competencies**

6.1. Repair engine electrical system components
6.2. Install, check and service engine electrical wiring, controls, switches, indicators, and protective devices

**AMT 7.0 — Demonstrate knowledge of lubrication systems to FAA powerplant and airframe competencies**

7.1. Identify and select lubricants
7.2. Repair engine lubrication system components

7.3. Inspect, check, service, troubleshoot and repair engine lubrication systems

**AMT8. 0—Demonstrate knowledgeofignition and starting systemstoFAA powerplant and airframecompetencies**

8.1. Overhaul magneto and ignition harness
8.2. Inspect, service, troubleshoot and repair reciprocating and turbine engine ignition systems and components
8.3. Inspect, service, troubleshoot and repair turbine engine electrical starting systems
8.4. Inspect, service, and troubleshoot turbine engine pneumatic starting systems

**AMT9.0—Demonstrateknowledgeoffuelmeteringsystemsto FAApowerplant and airframe competencies**

9.1. Troubleshoot and adjust turbine engine fuel metering systems and electronic engine fuel controls
9.2. Overhaul carburetor
9.3. Repair engine fuel metering system components
9.4. Inspect, check, service, troubleshoot and repair reciprocating and turbine engine fuel metering systems

**AMT10.0—Demonstrateknowledge ofenginefuelsystemsto FAApowerplant and airframe competencies**

10.1. Repair engine fuel system components
10.2. Inspect, check, service, troubleshoot and repair engine fuel systems

**AMT11.0—Demonstrate knowledge ofinductionandengine airflowsystemstoFAA power plant and airframe competencies**

11.1. Inspect, check, troubleshoot, service and repair engine ice and rain control systems
11.2. Inspect, check, service, troubleshoot and repair heat exchangers, superchargers, and turbine engine airflow and temperature control systems
11.3. Inspect, check, service and repair carburetor air intake and induction manifolds

**AMT12.0 — Demonstrate knowledge of engine cooling systems to FAA powerplant and airframecompetencies**

12.1. Repair engine cooling system components
12.2. Inspect, check, troubleshoot, service and repair engine cooling systems

**AMT13.0—Demonstrate knowledge ofengine exhaustand reversersystemstoFAA power plant and airframe competencies**

13.1. Repair engine exhaust system components
13.2. Inspect, check, troubleshoot, service and repair engine exhaust systems
13.3. Troubleshoot and repair engine thrust reverser systems and related components

**AMT14.0—Demonstrate knowledgeofpropellerstoFAA powerplant and airframe competencies**

14.1. Inspect, check, service and repair propeller synchronizing and ice control systems
14.2. Identify and select propeller lubricants
14.3. Balance propellers
14.4. Repair propeller control system components

14.5. Inspect, check, service and repair fixed-pitch, constant-speed and feathering propellers, and propeller governing systems
14.6. Install, troubleshoot, and remove propellers
14.7. Repair aluminum alloy propeller blades

**AMT15.0—Demonstrate knowledge ofinductedfanstoFAA powerplant and airframe competencies**

15.1. Inspect and troubleshoot unadducted fan systems and components

**AMT16.0 — Demonstrate knowledge of auxiliary power units to FAA powerplant and airframe competencies**

16.1. Inspect, check, service and troubleshoot turbine-driven auxiliary power units

**AMT 17.0 — Demonstrate knowledge of job-related safety requirements to FAA power plant and airframe competencies**

17.1. Demonstrate proper application of job site and shop rules and regulations to OSHA standards
17.2. Demonstrate correct selection and use of electrical and hand tools
17.3. Demonstrate proper techniques and practices for working on and around live equipment