

AVIATION MAINTENANCE

Aviation Maintenance is a comprehensive course that familiarizes students with Federal Aviation Regulations, weight and balance, ground operations, maintenance forms and records, non-destructive testing methods, aircraft paint and refinishing systems and the basics of aircraft welding. The course also covers various onboard systems including cabin atmospheric control systems, pressurization and fire detection/extinguishing systems. This course also familiarizes students with the inspection, damage evaluation and repair of composite and wood structures, windows and fabric covering systems used on aircraft.

- DOE Code: 5520
- Recommended Grade Level: Grade 11-12
- Recommended Prerequisites: None
- Credits: 2-3 credits per semester, maximum of 6 credits
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- This course is aligned with postsecondary courses for Dual Credit:
 - Vincennes University
 - AMNT 102- General Aviation Maintenance
 - AMNT 106- Materials, Processes and Welding
 - AMNT 164- Aircraft Systems
 - AMNT 166- Composite and Nonmetallic Structures

Dual Credit

This course provides the opportunity for dual credit for students who meet postsecondary requirements for earning dual credit and successfully complete the dual credit requirements of this course.

Application of Content and Multiple Hour Offerings

Intensive laboratory applications are a component of this course and may be either school based or work based or a combination of the two. Work-based learning experiences should be in a closely related industry setting. Instructors shall have a standards-based training plan for students participating in work-based learning experiences. When a course is offered for multiple hours per semester, the amount of laboratory application or work-based learning needs to be increased proportionally.

Career and Technical Student Organizations (CTSOs)

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in SkillsUSA, the CTSO for this area.

Content Standards

Domain – Onboard Systems

Core Standard 1 Students analyze various aircraft systems to prescribe appropriate maintenance and repair procedures.

Standards

- AM-1.1 Describe the methods used to control cabin pressure of a pressurized aircraft
- AM-1.2 Service a vapor cycle airconditioning system
- AM-1.3 Check an oxygen system for leakage
- AM-1.4 Describe the inspection requirements of cabin heating systems that utilize a combustion heater
- AM-1.5 Describe the fire extinguishing agent most suitable for built in aircraft fire extinguishing systems
- AM-1.6 Check fire warning sensors or detectors for short circuits
- AM-1.7 Describe the operating principles of a thermocouple temperature indicating circuit
- AM-1.8 Inspect, check, and service carbon monoxide systems

Domain – Fuel

Core Standard 2 Students examine aircraft fueling procedures to ensure safety and optimum performance of aircraft.

Standards

- AM-2.1 Describe the principle safety requirements of a fuel dump system
- AM-2.2 Recognize the safety requirements of defueling an aircraft
- AM-2.3 Perform fuel management, transfer, and refueling operations
- AM-2.4 Check and service fuel systems per manual instructions
- AM-2.5 Recognize the markings required for fuel filler openings
- AM-2.6 Recognize the precautions to follow when routing fuel lines

Domain – Exterior Maintenance

Core Standard 3 Students evaluate repair and maintenance processes for exterior aircraft components to determine appropriate maintenance procedures.

Standards

- AM-3.1 Determine the reason for using composite materials in aircraft construction
- AM-3.2 Construct composite structures
- AM-3.3 Identify and select non-destructive testing methods for composite structures
- AM-3.4 Make appropriate repairs to damaged composite structures
- AM-3.5 Perform a metallic “ring tap” test to inspect for delamination damage of bonded structures
- AM-3.6 Evaluate the extent of damage to a bonded structure and determine the type of repair needed per manufacturer’ manual
- AM-3.7 Select, install, and remove special fasteners in bonded and composite structures
- AM-3.8 Perform temporary repairs to aircraft windows
- AM-3.9 Remove scratches and surface grazings from plastic enclosures
- AM-3.10 Determine the air worthiness of aircraft windows

Domain – Aircraft Welding

Core Standard 4 Students perform various welding procedures to maintain exterior and interior components of aircraft.

- AM-4.1 Solder, braze, glass weld, and arc weld shield
- AM-4.2 Weld aircraft components per materials specifications

AM-4.3 Solder various aircraft materials

AM-4.4 Solder stainless steel

Domain – Interior Maintenance

Core Standard 5 Students demonstrate procedures for maintaining aircraft interior components to improve the service life span of the craft.

Standards

AM-5.1 Select appropriate fabric covering procedures and materials

AM-5.2 Select and apply appropriate fabric and fiberglass covering materials

AM-5.3 Determine the areas on a fabric covered aircraft most susceptible to deterioration

AM-5.5 Inspect, test, and determine the air worthiness of aircraft fabric and fiberglass

AM-5.5 Select appropriate repairs for aircraft fabric and fiberglass

AM-5.6 Describe the permissible wood substitutes for use in making repairs to wood structures

AM-5.7 Inspect wood structures and recognize acceptable and non acceptable wood defects

AM-5.8 Select appropriate wood repair procedures

Domain – Trim and Finishing

Core Standard 6 Students perform trim and finishing processes to maintain overall appearance of aircraft.

Standards

AM-6.1 Select and apply appropriate finishing products based on specifications of materials being repaired

AM-6.2 Apply trim, letters, and touch up paint per industry specifications

AM-6.3 Inspect finishes and identify defects

Domain – Aircraft Cleaning

Core Standard 7 Students perform appropriate aircraft cleaning procedures to maintain aircraft components.

Standards

AM-7.1 Identify and select appropriate cleaning materials for various aircraft components

AM-7.2 Inspect, identify, remove, and treat aircraft corrosion

Domain – Maintenance Preparation Procedures

Core Standard 8 Students establish a working knowledge of maintenance preparation procedures to ensure compliance with industry regulations.

Standards

AM-8.1 Perform complete weight and balance check and record data

AM-8.2 Safely start, ground operate, and shut down aircraft, move, service and secure aircraft and identify typical ground operational hazards

AM-8.3 Identify and select aircraft hardware and materials

AM-8.5 Demonstrate procedure for weighing aircraft

AM-8.5 Identify and select appropriate non-destructive testing methods

AM-8.6 Perform dye penetrant, eddy- current, ultrasonic, and magnetic particle inspection

AM-8.8 Perform basic heat treating processes

AM-8.8 Create maintenance reports per industry and governmental specifications