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 delAMnation 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-5.6  Select appropriate repairs for aircraft fabric and fiberglass
AM-5.7  Describe the permissible wood substitutes for use in making repairs to wood structures
AM-5.8  Inspect wood structures and recognize acceptable and non-acceptable wood defects

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