
Aviation Maintenance Technology**AMT105
COURSE OUTLINE****COURSE INFORMATION**

Course Name: AMT 105 Aviation Introduction and Context 15 Credits

COURSE TOPIC OUTLINE**1. Introduction to SSC AMT**

- a. Facility and Department Policies
- b. Learning Community Considerations
- c. Introduction to Aviation Industry
 - i. Background and Purpose of Regulations

2. Introduction to Aircraft

- a. Survey of Historical and Current Aircraft
 - i. General Aviation
 - ii. Transport
 - iii. Rotorcraft
- b. Introduction to Aircraft Powerplants
 - i. Reciprocating
 - ii. Turbine
- c. Airman Certification Standards (ACS)
 - i. FAA Testing and Certification

3. Ground Operations and Servicing

- a. Tow and Secure Aircraft
- b. Fuel and Aircraft Fueling
 - i. Aviation Gasoline
 - ii. Jet Fuel
 - iii. Fueling Safety
- c. Airport Operation and Engine Operation
 - i. Communication
 - ii. Engine Checklists
 - iii. Engine Safety Considerations
- d. Aviation Safety
 - i. Hazardous Materials
 - ii. Oxygen Servicing
 - iii. Fire Safety and Extinguishers

4. Mathematics

- a. Area and Volume
 - i. Capacity of Cylinders and Tanks
- b. Ratios, Proportions and Percentages

- i. Gear Ratios, Compression Ratios
 - ii. Uses of Percentages in Aviation
- c. Numbers and Algebra
 - i. Positive and Negative Numbers
 - ii. Scientific Notation
 - iii. Powers and Roots
 - iv. Common Equations in Aviation

5. Physics for Aviation

- a. Force, Power, Pressure
 - i. Classic Physics Equations
 - ii. Discussion of Horsepower
 - iii. Gas Laws
 - iv. Absolute, Gauge and Differential Pressure
- b. Simple Machines
 - i. Levers, Gears, and Incline Plane
 - ii. Mechanical Advantage
- c. Aerodynamics and the Atmosphere
 - i. Aerodynamic attributes of Airplanes
 - ii. Helicopter Aerodynamics
 - iii. Standard Atmosphere
 - 1. Pressure Altitude
 - 2. Density Altitude
 - 3. Humidity, Absolute and Relative

6. Regulations and Human Factors

- a. Federal Aviation Regulations
- b. Mechanic Privileges and Limitations
 - i. Inspections
 - ii. Airframe and Powerplant Certificates
- c. Aircraft Recordkeeping
 - i. Logbook Entries
 - ii. Airworthiness Directives
- d. FAA Forms
 - i. Airworthiness Certificate
 - ii. FAA 337
- e. Aviation Publications
 - i. Advisory Circulars
 - ii. Maintenance Manuals
 - iii. Type Certificate Data Sheets
- f. Aircraft Parts
 - i. Technical Standards Order
 - ii. Parts Manufacture Approval
- g. Human Factors
 - i. Human Error Principles
 - ii. Teamwork and Leadership
 - iii. Shift Turnover

Aviation Maintenance Technology**AMT 110**

COURSE OUTLINE

COURSE INFORMATION

Course Name: AMT 110 Fundamentals of Electricity and Electronics 15 Credits

COURSE TOPIC OUTLINE**1. Fundamentals of electricity and electronics**

- a. Electron theory (conventional flow vs. electron flow).
- b. Magnetism.
- c. Capacitance in a circuit.
- d. Inductance in a circuit.
- e. Alternating current (AC) electrical circuits.
- f. Direct current (DC) electrical circuits.
- g. Electrical laws and theory.
 - i. Ohm's Law
 - ii. Kirchhoff's Laws
 - iii. Watt's Law
 - iv. Faraday's Law
 - v. Lenz's Law
 - vi. Right-hand motor rule
- h. Electrical measurement tools, principles, and procedures.
- i. Voltage.
 - i. Regulation
- j. Current.
- k. Resistance.
 - i. Impedance
 - ii. Resistance in series
 - iii. Resistance in parallel
 - iv. Total resistance
- l. Power.
- m. Series circuits.
- n. Parallel circuits.
- o. Aircraft batteries.
- p. Transformers.
- q. Circuit continuity.
- r. Controlling devices, including switches and relays.
- s. Protective devices, including fuses, circuit breakers, and current limiters.
- t. Resistor types and color coding.
- u. Semiconductors, including diodes, transistors, and integrated circuits.
- v. Digital logic, including RAM, ROM, NVRAM, logic gates, inverter, rectifier, and flip flop.
- w. Binary numbers.
- x. Electrostatic discharge.

- y. Electrical circuit drawings.
- z. Complex/combined circuits.
- aa. AC and DC motors.

2. Aircraft drawings

- a. Drawings, blueprints, sketches, charts, graphs, and system schematics, including commonly used lines, symbols, and terminology.
- b. Repair or alteration of an aircraft system or component(s) using drawings, blueprints, or system schematics to determine whether it conforms to its type design.
- c. Inspection of an aircraft system or component(s) using drawings, blueprints, or system schematics.
- d. Terms used in conjunction with aircraft drawings, blueprints, or system schematics.

3. Aircraft weight & balance

- a. Weight and balance terminology.
- b. Purpose for weighing an aircraft.
- c. Weighing procedures, including the general preparations for weighing, with emphasis on aircraft
- d. weighing area considerations.
- e. Procedures for calculation of the following: arm, positive or negative moment, center of gravity (CG), or moment index.
- f. Purpose and application of weight and CG limits.
- g. Purpose of determining CG.
- h. Adverse loading considerations and how to calculate if adverse loading causes an out-of-limit condition.
- i. Determine proper empty weight configuration.
- j. Proper ballast placement.
- k. Jacking an aircraft.

4. Inspection concepts and techniques

- a. Measuring tools, including calipers, micrometers, and gauges.
- b. Calibration and tool accuracy requirements.
- c. Nondestructive Testing (NDT) procedures and methods.
- d. Aircraft inspection programs (e.g., progressive, 100-hour, annual, and other FAA-approved inspections).
- e. Aircraft inspection methods and tools for materials, hardware, and processes.

Aviation Maintenance Technology**AMT115**
COURSE OUTLINE**COURSE INFORMATION**

Course Name: AMT 115 Airframe Structure and Repair 15 Credits

COURSE TOPIC OUTLINE**1. Wood Structures**

- a. Types
- b. Evaluation of use
- c. Preparation
- d. Gluing
- e. Spar repair
- f. Rib repair
- g. Plywood
- h. Inspection
- i. Protection

2. Aircraft Covering

- a. Covering methods
- b. Organic fabrics
- c. Inorganic fabrics
- d. Approval for use
- e. Supplemental Type Certificates
- f. FAA field approval
- g. Structure preparation
- h. Fabric testing
- i. Coatings
- j. Attachment technique
- k. Patch repair
- l. Inspection

3. Aircraft Finishes

- a. Metal Finishing
- b. Paint removal
- c. Paint preparation
- d. Primers
- e. Finishing systems
- f. Fabric finishing organic fabric finishes
- g. Inorganic finishes
- h. Finish problems

- i. Paint and dope application
- j. Finishing equipment
- k. Safety equipment
- l. Inspection

4. Sheet metal and non-metallic structures

- a. Plastic Structures
 - i. Storing and handling
 - ii. Cutting
 - iii. Drilling
 - iv. Forming
 - v. Cementing methods
 - vi. Cleaning
 - vii. Installation methods
 - viii. Inspection and Repair
- b. Composite Structures
 - i. Fiberglass
 - ii. Kevlar
 - iii. Graphite
 - iv. Fabric weaves
 - v. Resins
 - vi. Foam
 - vii. Honeycomb
 - viii. Manufacturing methods
 - ix. Inspection and Repair
 - x. Safety
- c. Sheet Metal
 - i. Metal types
 - ii. Aircraft construction
 - iii. Fasteners
 - iv. Tools
 - v. Layout and Forming
 - vi. Sheet-metal joints
 - vii. Repair and Inspection

5. Welding

- a. Magnesium
- b. Titanium
- c. Stainless steel
- d. Tubular structure
- e. Solder and braze
- f. Gas weld
- g. Inspection
- h. Safety

Aviation Maintenance Technology**AMT120**
COURSE OUTLINE**COURSE INFORMATION**

Course Name: AMT 120 Airframe Systems I 15 Credits

COURSE TOPIC OUTLINE

- 1. Hydraulic and pneumatic theory**
 - a. Fluid power systems.
 - b. Hydraulics
 - c. Pneumatics.
 - d. Hydraulic system characteristics.
 - e. Physics review
 - f. Fluid dynamics.
 - g. Pascals law.
 - h. Flow restrictions and pressure drop.
 - i. Components

- 2. Hydraulic systems**
 - a. Components
 - b. Fluid
 - c. Pumps
 - d. Lines and fittings
 - e. Open and closed center systems
 - f. Transport aircraft regulations.
 - g. Maintenance and troubleshooting

- 3. Pneumatic systems**
 - a. Components
 - b. Gyros
 - c. Lines and fittings
 - d. Ram Air Turbines
 - e. Accumulators

- 4. Wheels and tires**
 - a. Buildup
 - b. Bearings
 - c. Inspection and inflation

5. Landing gear

- a. Configuration
- b. Retraction and extension
- c. Indicating systems
- d. Steering
- e. Inspection and repair
- f. Transport aircraft

6. Brakes

- a. General aviation
- b. Large aircraft
- c. Disc brakes.
- d. Master cylinders
- e. Boosted
- f. Power systems and deboosters
- g. Anti-skid systems
- h. Squat switch
- i. Emergency braking

7. Aircraft fuel systems

- a. Aviation fuels
- b. General aviation systems
- c. Transport aircraft.
- d. Tanks and strainers
- e. Valves
- f. Pumps
- g. Manifolds and cross flow
- h. Fuel quantity.
- i. Heat exchangers.

8. Water and waste systems

- a. Potable water and systems
- b. Components
- c. Operation
- d. Components
- e. Service and inspection.

Aviation Maintenance Technology**AMT 205**

COURSE OUTLINE

COURSE INFORMATION

Course Name: AMT 205 Airframe Systems II 15 Credits

COURSE TOPIC OUTLINE**1. Flight Controls**

- a. Tubing Control cables.
- b. Control cable maintenance.
- c. Cable connectors.
- d. Cable guides.
- e. Control stops.
- f. Push-pull tubes.
- g. Torque tubes.
- h. Bell cranks.
- i. Flutter and flight control balance.
- j. Rigging of aircraft flight controls.
- k. Aircraft flight controls and stabilizer systems.
- l. Other aerodynamic wing features.
- m. Secondary and auxiliary control surfaces.

2. Rotorcraft Fundamentals

- a. Rotorcraft aerodynamics.
- b. Flight controls.
- c. Transmissions.
- d. Rigging requirements for rotary wing aircraft.
- e. Design, type, and operation of rotor systems.
- f. Helicopter skid shoe and tube inspection.
- g. Rotor blade functions and construction.
- h. Rotor vibrations, track, and balance.
- i. Drive system vibrations and inspection.

3. Aircraft Instrument Systems

- a. Annunciator indicating systems and the meaning of warning, caution, and advisory lights.
- b. Magnetic compass inspection and operation.
- c. Magnetic compass swinging procedures.
- d. Pressure indicating instruments.
- e. Temperature indicating instruments.
- f. Position indication sensors and instruments.
- g. Gyroscopic instruments.
- h. Direction indicating instruments.
- i. Instrument vacuum and pneumatic systems.

- j. Pitot-static system.
- k. Fuel quantity indicating systems.
- l. Instrument range markings.
- m. Electronic displays.
- n. Electrostatic sensitive devices.
- o. Built-in test equipment.
- p. Electronic flight instrument system.
- q. Engine indication and crew alerting system.
- r. Head-up displays (HUDs).
- s. 14 CFR parts 43 and 91 requirements for static system leak checks.
- t. Instrument limitations, conditions, and characteristics.
- u. Angle of attack and stall warning systems.
- v. Takeoff and landing gear configuration warning systems.
- w. Aircraft bonding and protection.
- x. Instrument or instrument panel removal and installation.

4. Environmental Systems

- a. Pressurization systems.
- b. Bleed air heating.
- c. Aircraft instrument cooling.
- d. Exhaust heat exchanger and system component(s) function, operation, and inspection procedures.
- e. Combustion heater and system component(s) function, operation, and inspection procedures.
- f. Vapor-cycle system and system component(s) operation, servicing, and inspection procedures.
- g. Air-cycle system and system component(s) operation and inspection procedures.
- h. Cabin pressurization and system component(s) operation and inspection procedures.
- i. Types of oxygen systems and oxygen system component(s) operation (e.g., chemical generator, pressure cylinder).
- j. Oxygen system maintenance and inspection procedures.

5. Ice and Rain Control Systems

- a. Aircraft icing causes/effects.
- b. Ice detection systems.
- c. Aircraft and powerplant anti-ice systems and components.
- d. De-ice systems and components.
- e. Wiper blade, chemical, and pneumatic bleed air rain control systems.
- f. Anti-icing and de-icing system maintenance.
- g. Environmental conditions that degrade vision.

Aviation Maintenance Technology**AMT 210**

COURSE OUTLINE

COURSE INFORMATION

Course Name: AMT 210 Airframe Electricity and Inspection 15 Credits

COURSE TOPIC OUTLINE**1. Aircraft Electrical Systems**

- a. Basic Electricity
 - i. DC Circuits
 - 1. Current, Voltage, Resistance and Power
 - ii. AC Circuits
 - 1. Electromagnetic generation of power
 - 2. Power and Opposition to flow
- b. Power Generation
 - i. DC generators
 - 1. Types and Construction
 - 2. Controls
 - ii. DC Alternators
 - 1. Types and Construction
 - 2. Controls
 - iii. AC Generators and Alternators
 - 1. Drive Systems
 - 2. Controls
 - iv. Batteries
- c. Aircraft Electrical Systems
 - i. Single Engine
 - ii. Multi Engine
 - iii. Transport
- d. Wiring
 - i. Diagrams and Schematics
 - ii. Wire Types, Sizing, & Identification
 - iii. Installation and Termination
- e. Components and Lighting

2. Communications, Light Signals, and Runway Lighting Systems

- a. Radio Theory
 - i. Radio operating principles
 - ii. Radio components
 - iii. Radio Frequency
 - iv. Antenna function, types, Maintenance
- b. Communication
 - i. ACARS Operation

- ii. SELCAL Operation
 - iii. ELT
 - 1. Operation
 - 2. Testing
- c. Navigation
 - i. ADF, VOR, DME, TCAS, GPWS
 - ii. Weather radar
 - iii. Radio Altimeter
 - iv. ILS
 - 1. Localizer
 - 2. Glide slope
 - 3. Marker beacons
 - v. Transponders
- d. Global Positioning Systems
 - i. GPS theory
 - ii. GPS components and operation
- e. Autopilot
 - i. Theory
 - ii. Components and operation
 - iii. Auto-throttle
- f. Instrument Installation and Maintenance

3. Airframe Inspection

- a. Policy and Procedures
 - i. Inspection requirements
 - ii. Maintenance recordkeeping requirements
 - iii. AD compliance
 - iv. Conformity requirements
 - v. Use of FAA approved data
- b. Inspection Types
 - i. 100-Hour Inspections
 - 1. Creation of checklist
 - 2. Recordkeeping
 - ii. Annual Inspections
 - iii. Progressive Inspections
 - iv. Special Inspections
 - 1. Life-limited parts and replacement interval
- c. Corrosion
 - i. Identification and types
 - ii. Treatment

4. Fire Protection

- a. Fire Protection Basics
 - i. Fire types
 - ii. Fire zones
- b. Overheat and Detection Systems
 - i. Types of systems
 - ii. System operations and identification
 - iii. System inspection and maintenance

- iv. Troubleshooting and operational checks of detection systems
- c. Fire Extinguishing
 - i. Extinguishing agents
 - ii. Types of fire extinguishing systems
 - iii. System inspection and maintenance requirements
 - iv. Troubleshooting and operational checks of extinguishing systems
- d. Smoke Detection
 - i. Types of systems
 - 1. Smoke
 - 2. Toxic gas
 - ii. Operation of systems
 - iii. Inspection and maintenance of systems

Aviation Maintenance Technology**AMT 225**

COURSE OUTLINE

COURSE INFORMATION

Course Name: AMT 225 Powerplant Theory and Maintenance 15 Credits

COURSE TOPIC OUTLINE**1. Reciprocating engines**

- a. Operating principles
- b. Components and construction
- c. Overhaul and repair

2. Turbine engines

- a. Operating principles
- b. Components and construction
- c. Troubleshooting, maintenance, and inspection

3. Fuel systems and fuel metering

- a. Fuel/air ratio and fuel metering
- b. Float carburetor components, operation, and adjustment
- c. Fuel injection components, operation, troubleshooting and adjustment.
- d. Turbine engine fuel metering systems, including fuel control, pumps, valves and nozzles

4. Reciprocating engine induction and cooling

- a. Reciprocating engine air induction for carbureted and fuel injected engines.
- b. Carburetor and induction system icing
- c. Turbocharged and supercharged engines
- d. Engine cowling, baffles and seals

5. Turbine engine air systems

- a. Air flow around and through the engine core
- b. Turbine engine internal cooling
- c. Turbine engine bleed air system, components, and operation
- d. Turbine engine anti-ice system

6. Engine exhaust and reverse systems

- a. Reciprocating engine exhaust system components, operation, and inspection.
- b. Turbine engine exhaust system
- c. Noise suppression (e.g., mufflers, hush kits, augments tubes).
- d. Thrust reverser components, and operation.

Aviation Maintenance Technology**AMT 230**

COURSE OUTLINE

COURSE INFORMATION

Course Name: AMT 230 Advanced Powerplant 15 Credits

COURSE TOPIC OUTLINE**1. Propellers**

- a. Propeller theory and operation
- b. Types of propeller and blade designs
- c. Pitch control and adjustment, governors
- d. Remove and install propellers
- e. Turbine propellers
- f. Inspection, service and maintenance
- g. Blade tracking
- h. Documentation
- i. Synchronization systems
- j. Ice protection systems

2. Engine Inspection and Troubleshooting

- a. Engine inspection requirements and types of inspections
- b. Component inspection and service
- c. Compression check of reciprocating engines
- d. Documentation associated with inspections

3. Engine Instrument Systems

- a. Types of instruments for aircraft engines
- b. Instrument systems and operation
- c. Installation, inspection, service and troubleshooting instrument systems

4. Engine Electrical Systems

- a. DC and AC generation systems
- b. Electrical system components
- c. Electrical system tools and standard practices
- d. Wiring diagrams and schematics
- e. Inspect, service, troubleshoot and repair electrical system components, wiring and connectors

5. Lubrication Systems

- a. Types, grades and functions of oil
- b. Lubrication system designs and operation
- c. Lubrication system components and schematics
- d. Inspect, service, troubleshoot and repair lubrication system components

6. Ignition and Starting

- a. Ignition system theory
- b. Ignition system components
- c. Reciprocating and Turbine engine ignition systems
- d. Starting system theory
- e. Starting system components
- f. Inspect, service, troubleshoot and repair ignition system components
- g. Inspect, service, troubleshoot and repair starting system components
- h. Ignition and starting system safety considerations