## AIRFRAME AND POWERPLANT (AFPM)

Community and Technical College  
Airframe and Powerplant Program (https://www.ctc.uaf.edu/programs/aviation-maintenance/)  
907-455-2800

**AFPM F111  General Airframe and Powerplant**  
3 Credits  
Offered As Demand Warrants  
Shop practices, basic math, applied physics, FAA regulations, basic electricity, aircraft weight and balance, ground operations and servicing, cleaning and corrosion control, and materials and process. Preparation for the FAA Mechanics Airframe Structures Written, Oral and Practical Exam.  
**Prerequisites:** Experience requirements of FAR 65.77.  
**Lecture + Lab + Other:** 3 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F145  Basic Mathematics**  
1 Credit  
Offered Fall  
Review of applied and technical mathematics related to the construction and engines of aircrafts. Common, decimal, fractions and mixed numbers; extracting square roots and raising numbers to a given power; solving ratios, proportions and percentage problems; fundamental algebraic operations.  
**Prerequisites:** Admission to A & P program.  
**Lecture + Lab + Other:** 1 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F146  Basic Electricity**  
2 Credits  
Offered Fall  
Electrical theory and concepts for the aviation mechanic. Ohm's law, electrical circuits, diagrams, batteries and a variety of electrical components.  
**Prerequisites:** Admission to A & P Program.  
**Lecture + Lab + Other:** 2 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F147  Physics for Mechanics**  
0.5 Credit  
Offered Fall  
Applications of mechanics; levers, sound, fluid and heat dynamics. Basic aircraft structures and aerodynamics. (Course does not fulfill natural science requirements for any degree.)  
**Prerequisites:** Admission to A & P Program.  
**Lecture + Lab + Other:** 0.5 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F148  Aircraft Drawing**  
1 Credit  
Offered Fall  
Basic drafting. Drawings, symbols and schematic diagrams, sketches of repairs and alterations, blueprint information, graphs and charts.  
**Prerequisites:** Admission to A & P Program.  
**Lecture + Lab + Other:** 1 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F149  Fluid Lines and Fittings**  
0.5 Credit  
Offered Fall  
Rigid and flexible fluid lines and fittings, fabrication and installation.  
**Prerequisites:** Admission to A & P Program.  
**Lecture + Lab + Other:** 0.5 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F150  Materials and Processes**  
2 Credits  
Offered Fall  
Basic shop practices, including selection, identification and installation of aircraft hardware and materials, precision measuring tools and operations, basic heat treating processes, forms of nondestructive inspections.  
**Prerequisites:** Admission to A & P Program.  
**Lecture + Lab + Other:** 2 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F151  Cleaning and Corrosion Control**  
1 Credit  
Offered Fall  
Basic aircraft cleaning materials, methods and corrosion control.  
**Prerequisites:** Admission to A & P Program.  
**Lecture + Lab + Other:** 1 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F152  Federal Aviation Regulations**  
1 Credit  
Offered Fall  
Federal Aviation Regulations for maintenance of aircraft. Maintenance forms and records, publications, privileges and limitations of aircraft mechanics.  
**Prerequisites:** Admission to A & P Program.  
**Lecture + Lab + Other:** 1 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F153  Weight and Balance**  
1 Credit  
Offered Fall  
Weighing procedures, weight, arms, moments, center of gravity computations and placarding. Aircraft loading, required forms, weighing.  
**Prerequisites:** Admission to A & P Program.  
**Lecture + Lab + Other:** 1 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F154  Ground Operations and Servicing**  
0.5 Credit  
Offered Fall  
Starting, moving, servicing, securing and fueling aircraft.  
**Prerequisites:** Admission to A & P Program.  
**Lecture + Lab + Other:** 0.5 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus

**AFPM F205  Airframe Structures**  
3 Credits  
Offered As Demand Warrants  
**Prerequisites:** Experience requirements of FAR 65.77.  
**Lecture + Lab + Other:** 3 + 0 + 0  
**Grading System:** Letter Grades with option of Plus/Minus
AFPM F206   Airframe System and Components
2 Credits
Offered As Demand Warrants
Aircraft electrical, hydraulic and pneumatic systems. Landing gear, instruments, fuel, communication and navigation, cabin atmosphere control, and fire protection systems. Inspection, checking, troubleshooting, repair and servicing. Preparation for the FAA Mechanics Airframe Structures written, oral and practical exam.
Prerequisites: Experience requirements of FAR 65.77.
Lecture + Lab + Other: 2 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F215   MOS Powerplant Theory/Maintenance
2 Credits
Offered As Demand Warrants
Prerequisites: Experience requirements of FAR 65.77.
Lecture + Lab + Other: 2 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F216   MOS Powerplant System/Components
3 Credits
Offered As Demand Warrants
Prerequisites: Experience requirements of FAR 65.77.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F217   FAA Airframe & Powerplant Test Preparation
9 Credits
Offered As Demand Warrants
Preparation for the FAA Mechanics General, Airframe, Powerplant written, oral and practical exams.
Prerequisites: Must meet the experience requirements of 14 CFR 65.77 as evidenced by an approved FAA Form 8610-2.
Lecture + Lab + Other: 7.5 + 3 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F230   Aircraft Electrical Systems
2.5 Credits
Offered Spring
Wiring, control, indication and protection devices for AC and DC systems. Inspection, troubleshooting service and repair of these systems.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 2.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F231   Powerplant Electrical Systems
1.5 Credits
Offered Fall
Installation, inspection, testing, servicing engine electrical system wiring, controls, indicators and protective devices. Repair and service of electrical generating systems.
Prerequisites: Admission to A&P program.
Lecture + Lab + Other: 1.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F235   Aircraft Reciprocating Engines
4.5 Credits
Offered Spring
History and development of the aircraft reciprocating engine. Repair, overhaul and inspection of various types of engines. Operation and troubleshooting of engines.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 4.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F240   Turbine Engines
2 Credits
Offered Summer
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 2 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F244   Lubricating Systems
1.5 Credits
Offered Spring
Identification and selection of lubricants for aircraft powerplants. Inspection, service, troubleshooting and repair of the lubrication systems and components.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 1.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F245   Ignition Systems
2 Credits
Offered Summer
Overhaul, inspection and troubleshooting of reciprocating and gas turbine ignition systems. Repair and bench testing of components.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 2 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F246   Fuel Metering Systems
2 Credits
Offered Spring
Prerequisites: Admission to the A & P Program.
Lecture + Lab + Other: 2 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F248   Induction Systems
0.5 Credit
Offered Spring
Operation and service of aircraft induction, preheat, anti-ice and supercharger systems.
Prerequisites: Admission to A&P program.
Lecture + Lab + Other: 0.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus
AFPM F249   Powerplant Cooling Systems
0.5 Credit
Offered Spring
Inspection, service and repair of engine cooling systems – both air and liquid cooled installations.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 0.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F250   Powerplant Exhaust Systems
0.5 Credit
Offered Spring
Inspection, service and repair of engine exhaust systems. Includes operations of turbo compounded engines, thrust reversers and noise suppressors.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 0.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F251   Fuel Systems
1.5 Credits
Offered Fall
Inspection, servicing, troubleshooting and repair of aircraft and engine fuel systems and components.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 1.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F252   Propellers
2 Credits
Offered Spring
Identification and nomenclature of aircraft propellers. Operation, control and repair of both reciprocating and turbine engine installations.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 2 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F253   Transport Category Aircraft
1 Credit
Offered Spring
Introduction to transport category aircraft systems and components.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 1 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F254   Ice and Rain Control Systems
0.5 Credit
Offered Spring
Inspection, operation and troubleshooting of de-ice and anti-ice systems.
Prerequisites: Admission to A&P program.
Lecture + Lab + Other: 0.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F255   Fire Protection Systems
0.5 Credit
Offered Fall
Inspection, servicing, troubleshooting and repair of aircraft and engine fire detection and extinguishing systems.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 0.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F256   Communications and Navigation Systems
0.5 Credit
Offered Spring
Operation of aircraft avionics, autopilots and antennas, including inspection and installation.
Prerequisites: Admission to A&P program.
Lecture + Lab + Other: 0.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F257   Instrument Systems
0.5 Credit
Offered Fall
Inspection, troubleshooting, removal and replacement of aircraft and engine instruments and indicating systems.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 0.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F258   Cabin Atmosphere Control Systems
1 Credit
Offered Spring
Aircraft pressurization, air conditioning, heating and oxygen systems. Operation, inspection, troubleshooting, service and repair.
Prerequisites: Admission to A&P program.
Lecture + Lab + Other: 1 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F259   Hydraulic and Pneumatic Systems
1.5 Credits
Offered Spring
Operation of hydraulic and pneumatic systems and uses in aircraft. Identification of hydraulic fluids, seals, hydraulic and pneumatic control devices, inspection and servicing and troubleshooting.
Prerequisites: Admission to A&P program.
Lecture + Lab + Other: 1.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F260   Aircraft Landing Gear Systems
1.5 Credits
Offered Spring
Simple and complex landing gear systems. Operation, service and repair of mechanical and hydraulic retraction mechanisms. Wheel, tire and brake service. Aircraft speed and configuration warning systems, electric brake controls, anti-skid systems, landing gear position and warning systems.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 1.5 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

AFPM F261   Nonmetallic Structures
1 Credit
Offered Summer
Inspection, service and repair of wood structures. Preliminary and secondary repair of interior and service of plastic, honeycomb, bonded, and composite and laminated structures.
Prerequisites: Admission to A & P Program.
Lecture + Lab + Other: 1 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus
AFPM F262  Aircraft Coverings  
1 Credit  
Offered Summer  
Selection, application, inspection and testing of fabric and fiberglass coverings and methods of repair.  
Prerequisites: Admissions to A & P Program.  
Lecture + Lab + Other: 1 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

AFPM F263  Aircraft Finishes  
0.5 Credit  
Offered Summer  
Identification and selection of aircraft finishing materials. Application of paints, dopes, primers and trim.  
Prerequisites: Admission to A & P Program.  
Lecture + Lab + Other: 0.5 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

AFPM F264  Sheet Metal Structures  
3 Credits  
Offered Spring  
Aircraft sheet metal fabrication, inspection and repair, including rivets and fasteners.  
Prerequisites: Admission to A & P Program.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

AFPM F265  Aircraft Welding  
1.5 Credits  
Offered Summer  
Contemporary welding methods on aircraft structures. Oxyacetylene, arc, inert gas and brazing techniques. Inspection of welded structure and safety procedures.  
Lecture + Lab + Other: 1.5 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

AFPM F266  Assembly and Rigging  
1.5 Credits  
Offered Fall  
Aerodynamic theory and function of aircraft control surfaces. Fabrication and installation of control devices for fixed and rotary wing aircraft; jacking and control surface balance.  
Prerequisites: Admission to A & P Program.  
Lecture + Lab + Other: 1.5 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

AFPM F267  Airframe Inspections  
0.5 Credit  
Offered Summer  
Inspection and return of aircraft to service. Procedural and legal aspects of 100 hour, annual and periodic inspections.  
Prerequisites: Admission to A & P Program.  
Lecture + Lab + Other: 0.5 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

AFPM F270  Airframe Testing  
0.5 Credit  
Offered Summer  
Preparation for the Federal Aviation Administration written, oral and practical exams for the powerplant mechanics' license.  
Prerequisites: Admission to A & P Program.  
Lecture + Lab + Other: 0.5 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

AFPM F271  Powerplant Inspections  
0.5 Credit  
Offered Summer  
Methodology and record keeping for inspection of aircraft reciprocating and gas turbine engines.  
Prerequisites: Admission to A & P Program.  
Lecture + Lab + Other: 0.5 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

AFPM F272  Powerplant Testing  
0.5 Credit  
Offered Summer  
Preparation for the Federal Aviation Administration written, oral and practical exams for the powerplant mechanics' license.  
Prerequisites: Admission to A & P Program.  
Lecture + Lab + Other: 0.5 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

AFPM F325  Inspection Authorization Preparation  
2 Credits  
Offered As Demand Warrants  
Prepares FAA certificated Airframe and Powerplant mechanics eligible for an inspection authorization under FAR 65.91 for the FAA tests to obtain their inspection authorization. Course also includes practical aspects of the privileges and limitations of the holder of an IA.  
Prerequisites: FAA A & P Certificate, meet additional requirements of FAR 65.91.  
Lecture + Lab + Other: 1 + 2 + 0  
Grading System: Letter Grades with option of Plus/Minus