

# 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

Aircraft wood, dope, fabric finishes, welding, sheet metal, assembly and rigging and inspection. 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 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

Jet engine fundamentals, analysis and testing. Inspecting turbo jets, turbo shaft and turbo fan engines. Overhaul, inspection and fundamentals of reciprocating engines. 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 F216 MOS Powerplant System/Components**

3 Credits

Offered As Demand Warrants

Fuel metering, induction systems, propellers, control systems and powerplant electricity. Repair, inspection, service and troubleshooting. 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 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

Development, theory and operation of turbine engines. Engine design, performance, accessories and subsystems. Engine maintenance and overhaul.

**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

Fundamental operation of fuel metering systems in aircraft powerplants. Technical data to repair and overhaul carburetors and components. Inspecting, troubleshooting and adjusting turbine engine fuel metering systems and electronic fuel controls.

**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