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

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

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

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

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

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

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

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

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

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

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

AFPM F205 Airframe Structures
3 Credits
Offered As Demand Warrants
Prerequisites: Experience requirements of FAR 65.77.
Lecture + Lab + Other: 3 + 0 + 0

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
<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Offered/Semester</th>
<th>Description</th>
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<tr>
<td>AFPM F215</td>
<td>MOS Powerplant Theory/Maintenance</td>
<td>2</td>
<td>As Demand Warrants</td>
<td>Jet engine fundamentals, analysis and testing. Inspecting turbojets, 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</td>
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<tr>
<td>AFPM F216</td>
<td>MOS Powerplant System/Components</td>
<td>3</td>
<td>As Demand Warrants</td>
<td>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 exams. Prerequisites: Experience requirements of FAR 65.77. Lecture + Lab + Other: 3 + 0 + 0</td>
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<tr>
<td>AFPM F217</td>
<td>FAA Airframe &amp; Powerplant Test Preparation</td>
<td>9</td>
<td>As Demand Warrants</td>
<td>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</td>
</tr>
<tr>
<td>AFPM F230</td>
<td>Aircraft Electrical Systems</td>
<td>2.5</td>
<td>Spring</td>
<td>Wiring, control, indication and protection devices for AC and DC systems. Inspection, troubleshooting service and repair of these systems. Prerequisites: Admission to A &amp; P Program. Lecture + Lab + Other: 2.5 + 0 + 0</td>
</tr>
<tr>
<td>AFPM F231</td>
<td>Powerplant Electrical Systems</td>
<td>1.5</td>
<td>Fall</td>
<td>Installation, inspection, testing, servicing engine electrical system wiring, controls, indicators and protective devices. Repair and service of electrical generating systems. Prerequisites: Admission to A&amp;P program. Lecture + Lab + Other: 1.5 + 0 + 0</td>
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<tr>
<td>AFPM F235</td>
<td>Aircraft Reciprocating Engines</td>
<td>4.5</td>
<td>Spring</td>
<td>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 &amp; P Program. Lecture + Lab + Other: 4.5 + 0 + 0</td>
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<tr>
<td>AFPM F240</td>
<td>Turbine Engines</td>
<td>2</td>
<td>Summer</td>
<td>Development, theory and operation of turbine engines. Engine design, performance, accessories and subsystems. Engine maintenance and overhaul. Prerequisites: Admission to A &amp; P Program. Lecture + Lab + Other: 2 + 0 + 0</td>
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<tr>
<td>AFPM F244</td>
<td>Lubricating Systems</td>
<td>1.5</td>
<td>As Demand Warrants</td>
<td>Identification and selection of lubricants for aircraft powerplants. Inspection, service, troubleshooting and repair of the lubrication systems and components. Prerequisites: Admission to A &amp; P Program. Lecture + Lab + Other: 1.5 + 0 + 0</td>
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<tr>
<td>AFPM F245</td>
<td>Ignition Systems</td>
<td>2</td>
<td>Summer</td>
<td>Overhaul, inspection and troubleshooting of reciprocating and gas turbine ignition systems. Repair and bench testing of components. Prerequisites: Admission to A &amp; P Program. Lecture + Lab + Other: 2 + 0 + 0</td>
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<tr>
<td>AFPM F246</td>
<td>Fuel Metering Systems</td>
<td>2</td>
<td>Spring</td>
<td>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 &amp; P Program. Lecture + Lab + Other: 2 + 0 + 0</td>
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<tr>
<td>AFPM F248</td>
<td>Induction Systems</td>
<td>0.5</td>
<td>Spring</td>
<td>Operation and service of aircraft induction, preheat, anti-ice and supercharger systems. Prerequisites: Admission to A&amp;P program. Lecture + Lab + Other: 0.5 + 0 + 0</td>
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<tr>
<td>AFPM F249</td>
<td>Powerplant Cooling Systems</td>
<td>0.5</td>
<td>Spring</td>
<td>Inspection, service and repair of engine cooling systems -- both air and liquid cooled installations. Prerequisites: Admission to A &amp; P Program. Lecture + Lab + Other: 0.5 + 0 + 0</td>
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<tr>
<td>AFPM F250</td>
<td>Powerplant Exhaust Systems</td>
<td>0.5</td>
<td>Spring</td>
<td>Inspection, service and repair of engine exhaust systems. Includes operations of turbo compounded engines, thrust reversers and noise suppressors. Prerequisites: Admission to A &amp; P Program. Lecture + Lab + Other: 0.5 + 0 + 0</td>
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<tr>
<td>AFPM F251</td>
<td>Fuel Systems</td>
<td>1.5</td>
<td>Fall</td>
<td>Inspection, servicing, troubleshooting and repair of aircraft and engine fuel systems and components. Prerequisites: Admission to A &amp; P Program. Lecture + Lab + Other: 1.5 + 0 + 0</td>
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<tr>
<td>AFPM F252</td>
<td>Propellers</td>
<td>2</td>
<td>Spring</td>
<td>Identification and nomenclature of aircraft propellers. Operation, control and repair of both reciprocating and turbine engine installations.</td>
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<tr>
<td>AFPM F253</td>
<td>Transport Category Aircraft</td>
<td>1</td>
<td>Spring</td>
<td>Introduction to transport category aircraft systems and components.</td>
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<tr>
<td>AFPM F254</td>
<td>Ice and Rain Control Systems</td>
<td>0.5</td>
<td>Spring</td>
<td>Inspection, operation and troubleshooting of de-ice and anti-ice systems.</td>
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<tr>
<td>AFPM F255</td>
<td>Fire Protection Systems</td>
<td>0.5</td>
<td>Fall</td>
<td>Inspection, servicing, troubleshooting and repair of aircraft and engine fire detection and extinguishing systems.</td>
</tr>
<tr>
<td>AFPM F256</td>
<td>Communications and Navigation Systems</td>
<td>0.5</td>
<td>Fall</td>
<td>Operation of aircraft avionics, autopilots and antennas, including inspection and installation.</td>
</tr>
<tr>
<td>AFPM F257</td>
<td>Instrument Systems</td>
<td>0.5</td>
<td>Fall</td>
<td>Inspection, troubleshooting, removal and replacement of aircraft and engine instruments and indicating systems.</td>
</tr>
<tr>
<td>AFPM F258</td>
<td>Cabin Atmosphere Control Systems</td>
<td>1</td>
<td>Spring</td>
<td>Aircraft pressurization, air conditioning, heating and oxygen systems. Operation, inspection, troubleshooting, service and repair.</td>
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<tr>
<td>AFPM F259</td>
<td>Hydraulic and Pneumatic Systems</td>
<td>1.5</td>
<td>Spring</td>
<td>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.</td>
</tr>
<tr>
<td>AFPM F260</td>
<td>Aircraft Landing Gear Systems</td>
<td>1.5</td>
<td>Spring</td>
<td>Simple and complex landing gear systems. Operation, service and repair of mechanical and hydraulic retraction mechanisms. Wheel, tire and brake service.</td>
</tr>
<tr>
<td>AFPM F261</td>
<td>Nonmetallic Structures</td>
<td>1</td>
<td>Summer</td>
<td>Inspection, service and repair of wood structures. Preliminary and secondary repair of interior and service of plastic, honeycomb, bonded, and composite and laminated structures.</td>
</tr>
<tr>
<td>AFPM F262</td>
<td>Aircraft Coverings</td>
<td>1</td>
<td>Summer</td>
<td>Selection, application, inspection and testing of fabric and fiberglass coverings and methods of repair.</td>
</tr>
<tr>
<td>AFPM F263</td>
<td>Aircraft Finishes</td>
<td>0.5</td>
<td>Summer</td>
<td>Identification and selection of aircraft finishing materials. Application of paints, dopes, primers and trim.</td>
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<tr>
<td>AFPM F264</td>
<td>Sheet Metal Structures</td>
<td>3</td>
<td>Spring</td>
<td>Aircraft sheet metal fabrication, inspection and repair, including rivets and fasteners.</td>
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<tr>
<td>AFPM F265</td>
<td>Aircraft Welding</td>
<td>1.5</td>
<td>Summer</td>
<td>Contemporary welding methods on aircraft structures. Oxyacetylene, arc, inert gas and brazing techniques. Inspection of welded structure and safety procedures.</td>
</tr>
<tr>
<td>AFPM F266</td>
<td>Assembly and Rigging</td>
<td>1.5</td>
<td>Fall</td>
<td>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.</td>
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Airframe and Powerplant (AFPM)

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

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

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

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

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