UTAH SYSTEM OF HIGHER EDUCATION

Utah System of Higher Education
Aircraft Powerplant Technology
FY2027 / 38 Credits (1140 Clock-Hours)

Foundational Courses

Aircraft Powerplant Technology

TEMT 1005 Machining for Manufacturing Trades **3 Credits / 90 Clock-Hours**

This is a course to support manufacturing programs related to machining. It gives students a working overview of industrial machine shop practice. This course is designed to teach principles and techniques of manufacturing processes by learning to operate the lathe and mill. Students will be trained in areas of blueprint reading, hand tools, machining and part inspection, all with the use of manual machines.

Objectives:
• Identify safe practices in a machine shop.
• Identify correct clean up procedures.
• Demonstrate basic layout procedures.
• Reading and interpreting blueprints.
• Safely setup and operate a band saw.
• Safely operate a bench grinder and hand tools.
• Accurately use and read steel rules, micrometers, and calipers.
• Perform safe and effective use of lathes and milling machines.
• Perform basic programming and use controls of a CNC machine.

TEDR 1000 Technical Drafting **4 Credits / 120 Clock-Hours**

The Technical Drafting course is designed to help students develop and build familiarity with fundamental drafting concepts. Discussion concepts will include preparing industry standard documents using a drafting software.

Objectives:
• Explore various design fields including architecture, mechanical design, and/or civil design.
• Use sketching to communicate designs.
• Create isometrics, orthographic projections, sections, and auxiliary drawings, including basic annotations and dimensions.
• Use a CAD system as a drafting tool.
• Develop, modify, and plot CAD drawings.

TEAV 1000 Technical Mathematics **3 Credits / 90 Clock-Hours**

This course covers various specialized mathematical topics necessary for careers in trades and industries. These topics include, but are not limited to, systems of units, units of measure, scientific vs. metric prefix notation, functions, complex numbers, and vectors.

Objectives:
• Use systems of units and units of measure, scientific vs. metric prefix notation, algebraic and trigonometric functions, complex numbers, and vectors.
• Identify relevant steps for calculating multi-step problems to find solutions.
• Utilize trigonometric functions in a contextualized setting relevant to the field of study.
• Apply mathematic principles in various contexts and settings.

TEAV 1010 Circuit Analysis **3 Credits / 90 Clock-Hours**

This course consists of studying and applying DC and AC concepts, semiconductors, digital electronics, and microcomputers, including Ohm's Law, Kirchhoff's Voltage and Current Laws, resistance, capacitance, inductance, conductance, reactance, susceptance, impedance, admittance, and RC and RL time constants. Analysis of series, parallel, series-parallel, and bridge networks using Superposition, Thevenin's and Maximum Power Transfer Theorems, Resonance, Mesh, and Nodal Analysis.

Objectives:
• Identify passive and active components and understand their uses in electrical circuitry.
• Identify and read electrical schematics and their symbols.
• Correctly use a multimeter to read voltage, current, resistance, and capacitance.
• Differentiate types of circuits, including but not limited to resistive, capacitive, inductive, RLC, RC, and RL.

TEAV 1020 Circuit Analysis Lab **2 Credits / 60 Clock-Hours**

This course involves hands-on application of circuit analysis and application of theory. Students will demonstrate an understanding of circuit principles and demonstrate technical proficiency in measuring and troubleshooting circuits.

Objectives:
• Use schematic diagrams and symbols to prototype AC and circuits.
• Analyze voltage divider, bridge, and maximum power transfer circuits.
• Perform series, parallel, and series-parallel combination circuits calculations and measurements, and analyze circuits for faulty components.

TEAV 1130 Flight Principles **3 Credits / 90 Clock-Hours**

This course provides an introduction to the fundamentals of flight theory and the physics that govern flight. It covers the operation of aircraft control systems essential to flight and teaches the techniques for ground handling and servicing of aircraft.

Objectives:
• Explain Fundamental Flight Theory and Physics, including the aerodynamics and physics that govern how aircraft fly and operate.
• Identify Aircraft Control System Operations, including the essential systems crucial for flight, and explain how each component functions and interacts within the system.
• Demonstrate Ground Handling and Servicing Techniques by performing practical skills related to safe and efficient operations.

TEAV 1140 Aircraft Components and Principles **2 Credits / 60 Clock-Hours**

This course equips students with the skills needed for aircraft maintenance, emphasizing the application of FAA guidelines, manufacturer specifications, and airworthiness directives. Students will conduct thorough inspections, perform maintenance procedures such as cleaning and testing, and learn to select appropriate maintenance materials. Additionally, the course covers human factors in aviation maintenance to enhance safety, efficiency, and team dynamics.

Objectives:
• Read, comprehend, and apply information from FAA and manufacturer's aircraft maintenance specifications, manuals, publications, Federal Aviation Regulations, Airworthiness Directives, and Advisory material.
• Perform inspections, identify and treat aircraft corrosion, check welds, and execute precision measurements to ensure airworthiness.
• Utilize appropriate methods for aircraft cleaning, basic heat testing, and nondestructive testing to maintain and enhance aircraft safety and functionality.
• Identify and select the correct cleaning materials, hardware, and other materials required for aircraft maintenance tasks.
• Discuss human factors in aviation maintenance to improve safety, efficiency, and team dynamics, focusing on error management, fatigue mitigation, and effective communication strategies.

TEAV 2100 Aircraft Reciprocating Powerplants and Accessories **3 Credits / 90 Clock-Hours**

The theory of operation, maintenance, repair, and overhaul of reciprocating engines, propellers, exhaust systems, ignition systems, and fuel systems, with laboratory applications of the principles and components studied.

Objectives:
• Discuss the operational principles of reciprocating engines, propellers, exhaust systems, ignition systems, and fuel systems.
• Maintain, repair, and overhaul aircraft powerplant components to ensure optimal performance and safety.
• Apply theoretical knowledge to practical situations through laboratory applications, simulating real-world troubleshooting and repair scenarios.

TEAV 2110 Aircraft Reciprocating Powerplants and Accessories Lab **3 Credits / 90 Clock-Hours**

This course provides students with laboratory experiences related to the aircraft reciprocating powerplants and accessories course.

Objectives:
• Maintain, repair, and overhaul reciprocating engines, propellers, exhaust systems, ignition systems, and fuel systems.
• Perform practical application with aircraft components in a lab setting, simulating real-world challenges.
• Diagnose, disassemble, repair, and reassemble various powerplant system components effectively.

TEAV 2140 Aircraft Turbine Powerplants Maintenance Operations **3 Credits / 90 Clock-Hours**

This course provides an in-depth exploration of turbine power plants, focusing on the operation of turbine engines and their components. Students will learn about hot section inspections, servicing techniques, and the maintenance of propellers and engine exhaust systems. The curriculum also covers engine fire protection systems and the procedures for conducting 100-hour aircraft engine inspections and maintenance.

Objectives:
• Explain the theory and practical operation of turbine engines and their components.
• Conducti hot section inspections and service turbine powerplants including detailed procedures and safety precautions.
• Maintain and operate propellers and engine exhaust systems to ensure optimal performance and compliance with safety standards.
• Identify components and explain the function of engine fire protection systems, emphasizing their critical role in aircraft safety.
• Conducting 100-hour inspections and routine maintenance of aircraft engines focusing on adherence to regulatory standards and documentation procedures.

TEAV 2150 Aircraft Turbine Powerplants Maintenance Operations Lab **3 Credits / 90 Clock-Hours**

Application of the theory of turbine powerplants, including turbine engine and components operation, hot section inspection, servicing, propellers, and fire protection systems. Aircraft engine 100-hour inspections and maintenance, with laboratory applications of principles and components related to aircraft turbine powerplants maintenance operations.

Objectives:
• Operate and maintain turbine engine components during practical lab exercises.
• Perform detailed inspections and servicing of turbine engine hot sections, identify issues, and apply corrective actions.
• Maintain and repair propellers and engine exhaust systems, emphasizing safety and efficiency.
• Inspect, maintain, and troubleshoot engine fire protection systems, ensuring functionality and compliance with safety standards.
• Practice conducting thorough 100-hour inspections and routine maintenance of aircraft engines using tools and techniques critical for aviation safety.

TEAV 2420 FAA Regulations, Records, and Certification **2 Credits / 60 Clock-Hours**

Students learn the maintenance forms, records, and regulations for releasing aircraft to airworthy status. Certification of maintenance technicians is also included.

Objectives:
• Obtain the necessary knowledge, risk management, and skill elements as required by the FAA's Airmen Certification Standards (ACS) Section 1-General, subsection i - Regulations, Maintenance Forms, Records, and Publications.
• Effectively and efficiently work in a team environment.

TEAV 2430 Aircraft Electrical Systems and Components **2 Credits / 60 Clock-Hours**

Aircraft electrical power generating systems. Theory of generation, alternators, regulation, and control systems with laboratory application of principles and systems studied.

Objectives:
• Obtain the necessary knowledge, risk management, and skill elements as required by the FAA's Airmen Certification Standards (ACS) Section 1-General, subsection i - Regulations, Maintenance Forms, Records, and Publications.
• Demonstrate record keeping and necessary forms for FAA standards.
• Assess the airworthiness status of aircraft and maintenance schedules.
• Prepare for certification of maintenance technician status.

TEAV 2440 Aircraft Electrical Systems and Components Lab **2 Credits / 60 Clock-Hours**

Aircraft electrical power generating systems. Theory of generation, alternators, regulation, and control systems with laboratory application of principles and systems studied.

Objectives:
• Obtain the necessary knowledge, risk management, and skill elements as required by the FAA's Airmen Certification Standards (ACS) section 1-A Fundamentals of Electricity and Electronics, 2-K Aircraft electrical systems, and 3-F Engine electrical systems.
• Troubleshoot and diagnose Aircraft electrical faults and circuits.
• Apply theory to the principles of aircraft electrical competencies.