

Texas State Technical College FAST Trac Airframe and Powerplant Program

Texas State Technical College Course Title: TSTC FAST Trac Airframe and Powerplant

WECM Course Title: TSTC FAST Trac Airframe and Powerplant Program

WECM Course Rubric Number/CIP Code: XXXX-xxxx / 47.0607 & 47.0608

Course Hours: 160 course hours (General-40/Airframe-60/Powerplant-60)

Course Description and Objectives: Study of Federal Aviation Administration subject matter in the General, Airframe and Powerplant curricula with a focus on building knowledge of new materials, techniques and physical skills. This training is designed to provide the knowledge and skills not provided by civilian or military training and experience that is required to obtain the civilian Aviation Maintenance Technician certificate (A&P license). Upon completion of this course students will be able to:

- Weigh aircraft, perform weight-and-balance check, and record data and information derived from the weight and balance check.
- Write descriptions of work performed including aircraft discrepancies corrective actions using typical aircraft maintenance records and required maintenance forms, records, and inspection reports.
- Apply information contained in Federal Aviation Administration (FAA) and manufacturers' aircraft maintenance specifications, data sheets, manuals, and publications and related Federal Aviation Regulations, Airworthiness Directives, and Advisory material.
- Analyze technical data and exercise mechanic privileges within the prescribed limitations.
- Perform precision measurement procedures; identify and select non-destructive testing methods; perform non-destructive testing and heat treating procedures; identify and select aircraft hardware and materials; fabricate and install fluid lines and fittings; and inspect welds.

- Identify principles of basic aerodynamics; identify design principles of aircraft structures; and describe the theory of flight.
- Start, ground operate, move, service, and secure aircraft; identify typical ground operation hazards and safety; inspect, identify, remove, and treat aircraft corrosion.
- Calculate and measure electrical power, voltage, current, resistance, and continuity; determine the relationship of voltage, current, and resistance in electrical circuits; interpret aircraft electrical circuit diagrams including solid states devices and logic functions; inspect and service batteries.
- Repair and inspect aircraft electrical systems components; install, check, and service airframe electrical wiring, controls, switches, indicators, and protective devices; inspect, check, troubleshoot, service, and repair alternating and direct current electrical systems.
- Inspect, check, troubleshoot, service, and repair heating, cooling, air conditioning, oxygen, and pressurization systems and air cycle machines, airframe ice and rain control systems, smoke and carbon monoxide detection systems and aircraft fire detection and extinguishing systems.
- Inspect, check, service, troubleshoot, and repair aircraft fuel and management systems, fuel quantity-indicating systems, hydraulic and pneumatic systems and identify and select hydraulic fluids.
- Inspect, service, and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems and service landing gear systems.
- Select, install, and remove special fasteners for metallic structures; inspect and repair sheet metal structures; install conventional rivets; form, lay out, and bend sheet metal.
- Perform airframe conformity and airworthiness inspections.
- Rig fixed-wing aircraft; balance, rig, and inspect movable primary and secondary flight control surfaces and jack aircraft.

- Inspect, check, service, and repair propeller synchronizing systems, ice control systems, fixed-pitch, constant-speed, and feathering propellers and propeller governing systems and repair aluminum alloy propeller blades.
- Identify the components of a reciprocating engine; inspect, troubleshoot, check, service, and repair engine instrument systems; inspect, service, and repair lubrication and exhaust systems.
- Maintain powerplant electrical systems and components; maintain powerplant ignition, starting, and fire protection systems.
- Inspect, check, service, troubleshoot, and repair engine fuel systems and components, fuel metering systems and components, reciprocating and turbine engine fuel metering systems, engine ice and rain control systems, heat exchangers, superchargers, turbine engine airflow and temperature control systems.
- Overhaul reciprocating engines; inspect, check, service, and repair reciprocating engines and engine installations.
- Overhaul turbine engines; inspect, check, and repair turbine engines.
- Perform powerplant conformity inspections and powerplant airworthiness inspections.

Prerequisites: FAA authorization to take General, Airframe and Powerplant written, oral and practical examinations.

Certification (Y/N): Yes

Course Outline: (table below)

Subject Area	Subject Hours	Reference Materials
a. basic electricity	8	FAA Handbook 8083-30; FARs, General Study Guide
b. aircraft drawings	2	FAA Handbook 8083-30; FARs, General Study Guide
c. weight and balance	4	FAA Handbook 8083-30; FARs, General Study Guide

d. fluid lines and fittings	2	FAA Handbook 8083-30; FARs, General Study Guide
e. materials and processes	3	FAA Handbook 8083-30; FARs, General Study Guide
f. ground operation and servicing	3	FAA Handbook 8083-30; FARs, General Study Guide
g. cleaning and corrosion control	2	FAA Handbook 8083-30; FARs, General Study Guide
h. mathematics	2	FAA Handbook 8083-30; FARs, General Study Guide
i. maintenance forms and records	4	FAA Handbook 8083-30; FARs, General Study Guide
j. basic physics	2	FAA Handbook 8083-30; FARs, General Study Guide
k. maintenance publications	6	FAA Handbook 8083-30; FARs, General Study Guide
l. mechanic privileges and limitations	2	FAA Handbook 8083-30; FARs, General Study Guide
General total hours	40	
Subject Area	Subject Hours	Reference Materials
a. wood structures	1	FAA Handbook 8083-31; FARs, Airframe Study Guide
b. aircraft covering	1	FAA Handbook 8083-31; FARs, Airframe Study Guide
c. aircraft finishes	2	FAA Handbook 8083-31; FARs, Airframe Study Guide
d. sheet metal and non-metallic structures	12	FAA Handbook 8083-31; FARs, Airframe Study Guide
e. welding	2	FAA Handbook 8083-31; FARs, Airframe Study Guide
f. assembly and rigging	7	FAA Handbook 8083-31; FARs, Airframe Study Guide
g. airframe inspection	4	FAA Handbook 8083-31; FARs, Airframe Study Guide
h. aircraft landing gear systems	6	FAA Handbook 8083-31; FARs, Airframe Study Guide
i. hydraulic and pneumatic	4	FAA Handbook 8083-31; FARs, Airframe Study

power systems		Guide
j. cabin atmosphere control systems	3	FAA Handbook 8083-31; FARs, Airframe Study Guide
k. aircraft instrument systems	3	FAA Handbook 8083-31; FARs, Airframe Study Guide
l. communication and navigation systems	2	FAA Handbook 8083-31; FARs, Airframe Study Guide
m. aircraft fuel systems	3	FAA Handbook 8083-31; FARs, Airframe Study Guide
n. aircraft electrical systems	4	FAA Handbook 8083-31; FARs, Airframe Study Guide
o. position and warning systems	2	FAA Handbook 8083-31; FARs, Airframe Study Guide
p. ice and rain control systems	2	FAA Handbook 8083-31; FARs, Airframe Study Guide
q. fire protection systems	2	FAA Handbook 8083-31; FARs, Airframe Study Guide
Airframe total hours	60	

Subject Area	Subject Hours	Reference Materials
a. reciprocating engines	6	FAA Handbook 8083-32; FARs, Powerplant Study Guide
b. turbine engines	5	FAA Handbook 8083-32; FARs, Powerplant Study Guide
c. engine inspection	4	FAA Handbook 8083-32; FARs, Powerplant Study Guide
d. engine instrument systems	3	FAA Handbook 8083-32; FARs, Powerplant Study Guide
e. engine fire protection systems	2	FAA Handbook 8083-32; FARs, Powerplant Study Guide
f. engine electrical systems	4	FAA Handbook 8083-32; FARs, Powerplant Study Guide
g. lubrication systems	2	FAA Handbook 8083-32; FARs, Powerplant Study Guide
h. ignition and starting systems	10	FAA Handbook 8083-32; FARs, Powerplant Study Guide
i. fuel metering systems	8	FAA Handbook 8083-32; FARs, Powerplant Study

		Guide
j. engine fuel systems	3	FAA Handbook 8083-32; FARs, Powerplant Study Guide
k. induction and engine airflow systems	3	FAA Handbook 8083-32; FARs, Powerplant Study Guide
l. engine cooling systems	2	FAA Handbook 8083-32; FARs, Powerplant Study Guide
m. engine exhaust and reverser systems	3	FAA Handbook 8083-32; FARs, Powerplant Study Guide
n. propellers	4	FAA Handbook 8083-32; FARs, Powerplant Study Guide
o. auxiliary power units	1	FAA Handbook 8083-32; FARs, Powerplant Study Guide
Powerplant total hours	60	