

BASIC GENERAL POWER PLANET & STRUCTURE

COURSE OBJECTIVES:

To provide the mechanical engineer the basic knowledge of the A/c Systems & prepare them to have the A/C Type rating

WHO SHOULD ATTEND:

Newly hired mechanical engineers and high school certificated technicians with good command of English

DURATION:

6 months.

COURSE CONTENTS :

A. Power Plant

1-Gas turbine engine fundamentals:

- a. Introduction.
- b. The jet propulsion theory.
- c. Jet engines for aircraft.
- d. The generation of thrust.
- e. The thrust equation for a turbo jet.
- f. Measuring thrust in practice
- g. Factors affecting thrust.
- h. Types jet engines for aircrafts.

2-Gas turbine engine terms:

- a. Airspeed, Mach number and kits.
- b. Energy and efficiency.
- c. Engine station designations.
- d. Equivalent shaft horse power (turboprops).
- e. Gas generator.
- f. Letters and symbols.
- g. Percent Rpm.
- h. Pressure, pressure measurement and pressure ratio
- i. Specific fuel consumption.
- j. Standard atmospheric conditions.
- k. Subsonic, sonic and supersonic gas flow.
- l. Temperature, heat, temperature measurement and temperature ratio.

3-Gas turbine engine components:

- a. Air inlet duct.
- b. Engine air inlet section.
- c. Turbofan engine fan sections.
- d. Compressors.
- e. Diffuser section and air bleed.
- f. Fuel manifolds and nozzles.
- g. Burner section.
- h. Turbines.
- i. Exhaust ducts.
- j. Thrust reverses.
- k. Accessories.
- l. Starters.
- m. Fuel systems and fuel control.
- n. Lubrication system.
- o. Ignition systems.
- p. Engine cooling.
- q. Water injection.
- r. Protection against icing.
- s. Fuel-deicing systems.

4- Gas turbine engine operation:

- a. Engine ratings.
- b. Engine instrumentation.
- c. Engine controls and indicator Lights.
- d. Engine starting (tack-off, climb, cruise, descent, a approach and landing).
- e. Engine shutdown.

- f. Turboprop operation.
- g. Emergencies and malfunctions.
- h. Engine maintenance.
- i. Engine condition monitoring

5- Engine operational characteristics:

- a. Cleaning engine air passages.
- b. Compressor surge.
- c. Engine inlet anti-icing.
- d. Thrust setting, ratings, and limits.
- e. Exhaust gas temperature.
- f. Fuels.
- g. Lubrications.
- h. Trimming axial flow compressor engines.
- i. Turbojet, turboprop and turbofan characteristics.

6- Gas turbine engine performance:

- a. Definitions and symbols.
- b. Laws governing energy exchanges.
- c. Basic internal aerodynamics and thermodynamics.
- d. Gas turbine engine performance analysis.
- e. Component performance detail.
- f. Tables (temperature conversion, relative temperature and relative Pressure).

B. Airframe

1-Aircraft structures:

- a. Structural stresses.
- b. Wing, fuselage, nacelles, flight control surfaces and landing gear Structures.
- c. Skin and fairing, access and inspection doors.

2-Assembly and rigging:

- a. Theory of flight.
- b. Aerodynamics.
- c. The atmosphere (pressure, density and humidity).
- d. Bernoulli's principal and subsonic flow.
- e. Motion and airfoils.
- f. Center of gravity.
- g. Thrust and drag.
- h. Axes of aircraft

3-Aircraft fabric covering.

4-Aircraft painting and finishing.

5-Aircraft structural repairs:

6-Ice and rain protection.

7-Hydraulic and pneumatic power system.

8- Landing gear systems.

9- Fire protection systems.

10-Aircraft electrical systems.

11-Aircraft instrument system.

12- Communication and navigation systems.

13- Cabin atmosphere control system.

C. Airframe and Power Plant Practical Training

The practical training in conducted in equipped workshops, laboratories and in the maintenance field on an aircraft and its related systems and components.