

LICENCE WITHOUT TYPE RATING CATEGORY (C) TURBINE ENGINE

1- Basic mechanics

- Introduction
- Principles of jet propulsion
- Methods of jet propulsion

3- Working cycle and airflow

- Introduction
- Working cycle
- The relations between pressure, volume and temp.
- Changes in velocity and pressure
- Airflow

5- Compressors

- Introduction
- * Centrifugal flow compressor
- Principles of operation
- Construction
- Impellers
- Diffusers
- * The Axial flow compressor
- Principles of operation
- Construction
- Rotors
- Rotors blades
- Stator vanes
- * Operating conditions
- * Airflow control
- * Materials
- * Balancing

7- Combustion chambers

- * Introduction
- * Combustion process
- * Fuel supply
- * Types of C.C
- * Combustion chamber performance
- * Materials

9- Turbines

- * Introduction
- * Energy transfer from gas flow to turbine
- * Construction
- Nozzle guide vanes
- Turbine discs
- Turbine blades
- Contra- rotating turbines
- Dual alloy discs
- * Compressor - turbine matching
- * Materials
- Nozzle guide vanes
- Turbine discs
- Turbine blades
- * Balancing

11- Exhaust system

- Introduction
- Exhaust gas flow
- Construction and materials

13- Accessory drives

- Introduction
- Gear boxes and drives
- Construction and materials

15- Lubrication

- Introduction
- Lubricating systems
- Oil system components
- Lubricating oils

17- Internal air system

- * Introduction
- * Cooling
 - Turbine Cooling
 - Bearing chamber cooling
 - Accessory cooling
- * Sealing
 - Labyrinth seals
 - Ring seals
 - Hydraulic seals
 - Carbon seals
 - Brush seals
 - Hot gas ingestion
- * Control of bearing loads
- * Surge protection
- * Aircraft services

19- Fuel system

- * Introduction
- * Manual and automatic control
- * Fuel control systems
- * Electronic engine control
- * Low pressure fuel system
- * Fuel pumps
- * Fuel spray nozzles
- * Fuel heating
- * Effect of a change of fuel
- * Gas turbine fuels
- * A/C fuel sys.

21- Starting and ignition

- Introduction
- Methods of starting
- Ignition
- Relighting

23- Control and instrumentation

- * Introduction
- * Controls
- * Instrumentation
 - Engine thrust
 - Engine speed
 - Engine torque
 - Turbine gas temp.
 - Oil temp.
 - Oil pressure
 - Fuel temp. and pressure
 - Fuel flow
 - Vibration
- * Rigging procedure

- Warning sys.

23- Ice protection

- Introduction
- Hot air sysem
- Electrical sys

25- Fire protection

- Introduction
- Prevention of engine fire ignition (ext cooling and ventilation)
- Fire detection
- Fire extinguishing
- Engine overheat detection

27- Thrust reversal

- Introduction
- Principles of operation
- Construction and materials

29- Noise suppression

- Introduction
- Engine noise
- Methods od suppressing noise
- Construction and materials

31- Power plant installation

- Introduction
- Power plant location
- Air intakes
- Engine and jet pipe
- Mountings
- Accessories
- Cow lings

33- Auxilary power units

- Introduction
- APU systems
- Fire protection
- Mountings

35- Maintenances

- * Introduction
- * On wing maintenance
- Scheduled maint.
- Unscheduled maint.
- * Condition monitoring
- * Maintenance precautions
- * Trouble shooting
- * Adjustments
- * Ground testing
- * Engine preservation