

# Civil Aviation Training Institute

Hyderabad – Pakistan

## HANDBOOK OF COURSES



**SCHOOL OF ELECTROMECHANICAL ENGINEERING**

## **LIST OF COURSES**

Course title	Duration (in weeks)
<b>Basic Electrical Courses</b>	
Electrical Maintenance Technicians	26
<b>Regional Courses</b>	
Airport Lighting Maintenance (STP)	04
Aerodrome Power Supply Maintenance	04
Cable Fault Analysis and Repair Techniques	04
<b>Mechanical Courses</b>	
Diesel Plant Maintenance Mechanics	26
Diesel Fuel Pumps and Injectors Testing and Calibration	12
Special Purpose Vehicle Maintenance	12
<b>HVAC Courses</b>	
Environment System & Control	06
Air Conditioning / Refrigeration Maintenance Mechanics	26
Air Conditioning & Refrigeration Review Maintenance	08

## **ELECTRICAL MAINTENANCE TECHNICIANS COURSE (ICAO NO.104)**

### **OBJECTIVE:**

To develop knowledge of the working principles of electrical Airways Equipment, visual Landing Aids and Airport Lighting.

### **ELIGIBILITY:**

- Matric Science or equivalent
- Aptitude in electrical field.
- Working knowledge of English language

### **DURATION: 26 WEEKS**

### **SUBJECTS:**

- Safety
- Basic Mathematics
- Fundamental Concepts of Electricity and Magnetism
- Batteries
- D.C. Principles
- A. C Principles
- Instruments
- Transformers, Generators, Motors
- Controls
- Electronics
- Metal Work
- Physics of Light
- Protection Devices
- Solar Power
- Power Generation on Aerodrome
- Air Field Lighting
- Visual Landing Aids

## **AIRPORT LIGHTING MAINTENANCE COURSE (STP)**

### **OBJECTIVE:**

To develop basic skills required to maintain Aerodrome Lighting System.

### **ELIGIBILITY:**

- In service CAA technician with at least one year of maintenance experience in APL or closely related field. In addition the trainee should have.
- Satisfactorily completed S.S.C with (Physics and Math) or equivalent Education.
- Passed the basic Electrical Maintenance Technician Course (from CATI) or Equivalent for trainees from the region.
- Good written and oral command of English.

### **DURATION: 04 WEEKS**

### **SUBJECTS:**

- Series Aerodrome Lighting Systems
- Runway and Taxiway light fittings
- Centre line lighting
- Aerodrome Beacons
- Apron Lighting
- Maintenance Techniques
- Annex 14 and ICAO Aerodrome Design manual requirements
- Approach lighting
- PAPI
- Hazard Beacons, Obstruction lighting
- Constant Current Regulators

## **AERODROME POWER SUPPLY MAINTENANCE COURSE (ICAO NO.104)**

### **OBJECTIVE:**

To develop knowledge and skills required to maintain essential aerodrome power supplies.

### **ELIGIBILITY:**

- H.S.C (Science with Mathematics).
- Should have passed aerodrome electrical or line maintenance course.

**DURATION: 04 WEEKS**

### **SUBJECTS:**

- Standby power
- Primary power
- No-break power
- Phase failure detection
- Changeover functions
- Alerting and monitoring
- Engine protection devices
- Generator test procedures
- Control Panel functions
- Preventive maintenance

**CABLE FAULT ANALYSIS AND REPAIR TECHNIQUES COURSE  
(ICAO NO.109)**

**OBJECTIVE:**

To develop knowledge and skill to locate faults in underground cable for effective repair and maintenance.

**ELIGIBILITY:**

- H.S.C (Science with mathematics).
- Should have passed electrical course.
- Minimum 3 years practical experience in Aerodrome Electrical or Line maintenance.

**DURATION: 04 WEEKS**

**SUBJECTS:**

- Construction of underground cables
- Theory of fault location
- Fault location test equipment
- Practical fault location
- Practical cable repairs
- Maintenance/upkeep of aerodrome cable records and plans

## **DIESEL PLANT MAINTENANCE MECHANICS COURSE (ICAO NO.109)**

### **OBJECTIVE:**

To provide knowledge and skill to maintain and repair diesel power plants including fuel injection and electrical system in generators.

### **ELIGIBILITY:**

- Matric Science or equivalent.
- Working knowledge of English language.

### **DURATION: 26 WEEKS**

### **SUBJECTS:**

- Introduction to Mathematics
- Operation principles
- Fuel injectors and Ignition System
- Exhaust System
- Lubricating System
- Troubleshooting
- Basic types of Engines
- Combustion Chamber type
- Details of Engine Parts
- Filters
- Starting and Control System
- Tune up
- Diesel Electric power Plants

**DIESEL FUEL PUMPS AND INJECTORS TESTING AND CALIBRATION  
COURSE  
(ICAO NO.109)**

**OBJECTIVE:**

A successful graduate of this course will possess knowledge and skills to calibrate Bosch CVA in-line (Jerk type) and distributors type Fuel Injection pumps and operate other related equipment e.g. Injector, Nozzle cleaning & reconditioning, Spray pattern, Smoke testing, Nipple making equipment.

**ELIGIBILITY:**

- 3 years Diploma of Associate Engineer from any recognized Technical Institute in Mechanical or Automotive Technology or
- Diesel Mechanics course from CATC with 3 years experience or
- Basic Course for Diesel Mechanics from CATC
- Special Vehicle Maintenance Course from CATC.
- Working knowledge of English language.
- Can work with dexterity with both hands

**DURATION: 12 WEEKS**

**SUBJECTS:**

- Diesel engine fuel Injection system
- Fuel injectors
- Detroit Diesel unit Injector System
- Fuel Injection Pump Generators
- Spray pattern
- Nipple making equipment
- Combustion Chambers
- In-line (Jerk) Fuel Injection Pumps testing & Calibration
- Cummins PTG fuel system and Injectors
- Nozzle cleaning & reconditioning
- Smoke testing

## **SPECIAL PURPOSE VEHICLE MAINTENANCE COURSE (ICAO NO.109)**

### **OBJECTIVE:**

A successful graduate of this course will possess adequate knowledge and skills required for general maintenance of Rescue and Fire Fighting Vehicle, Runway Sweepers and related equipment.

### **ELIGIBILITY:**

- Diesel Vehicle Maintenance supervisors course from CATC or
- Diesel Mechanics from CATC or
- 3 years diploma of Associate Engineers from any recognized technical Institute, in Mechanical or Automotive technology.
- Diesel Vehicle Maintenance Supervisors course from CATI or any other recognized institute or
- 26 weeks Basic course in Diesel Mechanics from CATI, or
- 3 years Diploma of Associate Engineers from any recognized Technical Institute, in Mechanical or Automotive Technology.

**DURATION: 12 WEEKS**

### **SUBJECTS:**

- Diesel engine Construction & Operation
- Diesel Engine testing & troubleshooting
- Fuel Injection system testing & Calibration
- Specification for Rescue and Fire fighting vehicles
- Rapid Intervention Vehicle
- Major Fire Crash Tender
- Preventive maintenance procedures
- Hydraulic and Pneumatics
- Airfields Runway Sweeper
- Runway Rubber Remover
- Clerical Record duties and inventory control

## **ENVIRONMENTAL SYSTEM & CONTROL COURSE (ICAO NO.101)**

### **OBJECTIVE:**

To develop knowledge & skill to operate, maintain Air-Conditioning & Refrigeration system and to monitor Air-conditioning performance.

### **ELIGIBILITY:**

- 3 years Diploma of Associate Engineers (Mech./Refrigeration & Air-conditioning) from any recognized polytechnic institute or from CATI Hyderabad.
- Air-conditioning / Refrigeration Maintenance Mechanics Course from any recognized training institute.

**DURATION: 06 WEEKS**

### **SUBJECTS:**

- Air handling Equipment
- Environmental Control in Air-conditioning system
- Air balancing
- Cooling load calculation theory & Duct designing methods
- Control Air handler, Chiller & Heating coils
- Automatic control devices & Microprocessor control
- Hot Water / Steam Boilers
- Trouble shooting & preventive maintenance
- Ventilation Pollution
- Energy Conservation in air-conditioning and Refrigeration Chilling system

**AIRCONDITIONING/REFRIGERATION MAINTENANCE MECHANICS  
COURSE.  
(ICAO NO.105)**

**OBJECTIVE:**

To develop basic knowledge of the principles of Refrigeration and Air-conditioning system and enable the trainee to diagnose, trouble shoot, rectify fault by following system maintenance procedures.

**ELIGIBILITY:**

- Matric Science or equivalent
- Aptitude in Air-conditioning/Refrigeration
- Working knowledge of English language

**DURATION: 26 WEEKS**

**SUBJECTS:**

- Introduction to Mathematics
- Physics relating to Air-conditioning/Refrigeration
- Water Treatment and Testing
- General Safety
- Metal Work
- Electrical Theory
- Fundamental air-conditioning
- Gauges

**AIRCONDITIONING & REFRIGERATION REVIEW MAINTENANCE  
COURSE  
(ICAO NO.105)**

**OBJECTIVE:**

To develop basic knowledge & skills, to operate, maintain and repair Air-conditioning & Refrigeration System.

**ELIGIBILITY:**

- Matric science or equivalent and have one of the following technical background.
- One year Refrigeration and Air-conditioning Certificate course from any recognized Technical Institute & have minimum 2 years practical experience.
- Employed in CAA as technician or supervisor & working in Air-conditioning System Maintenance.

**DURATION: 08 WEEKS**

**SUBJECTS:**

- Units Measurements & Measuring Instruments
- Safety precaution Air-conditioning Refrigeration Equipments
- Basic Refrigeration cycles and leak Testing / Evaluation Dehydration / Charging Procedures
- Reciprocating/Centrifugal Water Chillers
- Air handling Equipments & Air balancing Techniques
- Air-conditioning Plant performance monitoring
- Preventive maintenance