LONDON INTERNATIONAL SCHOOL FOR AVIATORS

AVIATION TRAINING PROGRAMS

Aircraft Maintenance & Engineering

Syllabus prepared by industry experts, with strong consideration of UK and international requirements.

Table of Contents

Contents

SECTION A: FOUNDATION / BASIC KNOWLEDGE MODULES

Module 1: Mathematics

- Arithmetic & algebra
- Geometry & trigonometry
- Graphs & statistics
- Logarithms & exponentials

Module 2: Physics

- Mechanics
- Thermodynamics
- Fluid dynamics
- Optics
- Electricity fundamentals
- Magnetism

Module 3: Electrical Fundamentals

- Electron theory
- DC circuits
- AC theory
- Capacitance & inductance
- Transformers
- Electrical measurements

Module 4: Electronic Fundamentals

- Semiconductor theory
- Diodes & transistors
- Integrated circuits
- Digital electronics
- Logic gates
- Microprocessors

Module 5: Digital Techniques / Electronic Instrument Systems

- Binary & hexadecimal systems
- Data buses
- Aircraft data networks
- Electronic displays
- EICAS / ECAM systems

Module 6: Materials & Hardware

- Aircraft materials (ferrous/non-ferrous)
- Composites
- Corrosion & prevention
- Standard hardware
- Bearings, fasteners

Module 7: Maintenance Practices

- Tool control
- Calibration
- Workshop safety
- Welding & soldering
- Bonding & grounding
- Aircraft handling & storage

Module 8: Basic Aerodynamics

- Principles of flight
- Lift & drag
- Stability & control
- High-speed aerodynamics

Module 9: Human Factors

- Human performance & limitations
- Shell model
- Error management
- Fatigue & stress
- Safety culture

Module 10: Aviation Legislation

- ICAO framework
- Airworthiness requirements
- Part-145 / CAR-145
- Part-M / CAMO
- MOE structure
- Certification & release to service

SECTION B: AIRCRAFT SYSTEMS (B1 – MECHANICAL)

Module 11A: Turbine Engine AeroplaneSystems

- Airframe structures
- Hydraulic systems
- Pneumatics
- Environmental control systems
- Landing gear
- Fuel systems
- Ice & rain protection

Module 15: Gas Turbine Engines

- Engine construction
- Engine performance
- FADEC systems
- Borescope inspection
- Engine troubleshooting

Module 17: Propeller Systems

- Fixed & variable pitch
- Governor systems
- Propeller balancing

SECTION C: AVIONICS (B2)

Module 11B: Avionic Systems

- Communication systems
- Navigation systems
- Autopilot
- Flight management systems
- Weather radar
- TCAS / GPWS

Module 13: Aircraft Aerodynamics, Structures & Systems (Avionic Integration)

- Engine construction
- Engine performance
- FADEC systems
- Borescope inspection
- Engine troubleshooting

SECTION D: PRACTICAL MAINTENANCE TRAINING

Module 18: Workshop Practical

- Sheet metal repair
- Composite repair
- Electrical wiring
- EWIS practices
- Tool usage

Module 19: Hangar / Line Maintenance Practical

- Transit checks
- Daily checks
- Defect rectification
- Logbook entries
- MEL application

Module 20: Fuel Tank Safety (FTS)

- CDCCL
- Ignition source prevention
- Human factors in fuel systems

Module 21: EWIS (Electrical Wiring Interconnection System)

- Wiring inspection
- Routing & clamping
- Contamination prevention

SECTION E: SAFETY & COMPLIANCE

Module 22: Safety Management System

- Hazard identification
- Risk assessment
- Occurrence reporting

Module 23: Compliance Monitoring

- Audit procedures
- Root cause analysis
- Corrective actions

Module 24: Quality & Documentation

- MOE control
- Work order system
- Technical records retention

Module 21: EWIS (Electrical Wiring Interconnection System)

- Wiring inspection
- Routing & clamping
- Contamination prevention

SECTION F: ON-THE-JOB TRAINING (OJT)

- Minimum 2 years practical experience (as per authority requirement)
- Task logbook completion
- Supervisor certification
- Final competence assessment

2. DGR Training (Dangerous Goods Regulations)

Module 1: Regulatory Framework & International Requirements

1.1 International Frameworks

- ICAO Annex 18
- ICAO Technical Instructions (TI)
- IATA DGR structure
- UN Recommendations on Transport of Dangerous Goods

1.2 National Regulations

- CAR Section 9 (DGCA)
- EASA Air OPS & AMC/GM
- FAA 49 CFR Parts 171–180
- UK CAA Air Navigation Order
- GCAA CAR Part VIII
- GACA Dangerous Goods Regulations
- CASA CASR Part 92
- GCC & South Asian national DGR rules

1.3 Operator Responsibilities

- Approval requirements
- DGR manuals
- Training & recurrent training
- Compliance monitoring

Module 2: Classification of Dangerous Goods

2.1 Hazard Classes (9 Classes)

- Explosives
- Gases
- Flammable Liquids
- Flammable Solids
- Oxidizers & Organic Peroxides
- Toxic & Infectious Substances
- Radioactive Material
- Corrosives
- Miscellaneous Dangerous Goods

2.2 UN Numbers & Proper Shipping Names

- UN numbering system
- Special provisions
- Packing groups (I, II, III)

Module 3: Identification, Marking & Labelling

3.1 Hazard Labels

- Primary & subsidiary risk labels
- Cargo Aircraft Only label

3.2 Markings

- UN specification markings
- Orientation arrows
- Lithium battery marks

3.3 Documentation

- Shipper's Declaration
- Air Waybill requirements
- NOTOC (Notification to Captain)

Module 4: Packing Requirements

4.1 Packing Instructions

- Passenger aircraft vs Cargo aircraft
- Limited quantities
- Excepted quantities

4.2 Packaging Performance Standards

- UN specification packaging
- Inner & outer packaging
- Overpacks

4.3 Compatibility & Segregation

- Incompatible goods
- Loading segregation charts

Module 5: Handling & Acceptance Procedures

5.1 Acceptance Checklists

- IATA checklist usage
- Verification of documentation

5.2 Storage Requirements

- Temperature control
- Segregation rules
- Security measures

5.3 Loading Procedures

- Aircraft compartment limitations
- Live animals & DG restrictions

Module 6.1 Lithium Batteries

6.1 Lithium Batteries

- UN 3480 / UN 3481
- State of charge limits
- Fire risk mitigation

6.2 Radioactive Materials

- Transport Index
- Radiation limits
- Emergency procedures

6.3 Infectious Substances

- Category A & B
- Biological substances

6.4 Dry Ice & Magnetized Material

Module 7: Emergency Response Procedures

7.1 In-Flight Emergency Procedures

- Fire suppression
- Smoke procedures
- Lithium battery fire response

7.2 Ground Incident Response

- Spill response
- Isolation procedures
- Reporting requirements

7.3 Emergency Response Guide (ERG)

- Quick reference usage
- Incident classification

6.4 Dry Ice & Magnetized Material

Module 8: Security of Dangerous Good

8.1 Security Awareness

- High consequence DG
- Insider threat prevention

8.2 Reporting Suspicious Activities

- Authority reporting channels
- Incident reporting obligations

MODULE 9: Human Factors & Safety Culture

Human error in DG handling

Fatigue & workload

Just culture principles

SMS interface with DGR

3. SMS Training (Safety Management System)

Module 1: Introduction to Safety Management

1.1 Evolution of Aviation Safety

- Accident statistics & lessons learned
- Reactive vs proactive vs predictive safety

1.2 ICAO Safety Framework

- Annex 19 overview
- State Safety Programme (SSP)
- Service Provider SMS

1.3 Definitions & Key Concepts

- Hazard
- Risk
- Safety performance
- Acceptable Level of Safety (ALoS)

Module 2: SMS Framework – Four Pillars

2.1 Safety Policy & Objectives

- Management commitment
- Safety accountability
- Accountable Manager responsibilities
- Safety policy statement
- Emergency Response Plan (ERP)

2.2 Safety Risk Management (SRM)

- Hazard identification methods
- Risk assessment process
- Risk matrix (severity & probability)
- Risk mitigation strategies
- Change management
  Practical Exercise: Risk assessment workshop

2.3 Safety Assurance

- Safety performance monitoring
- Internal audits & compliance monitoring
- Safety investigations
- Management of change
- Continuous improvement

2.4 Safety Promotion

- Training & communication
- Safety meetings
- Safety bulletins
- Just culture awareness

Module 3: Hazard Identification & Reporting Systems

Mandatory Occurrence Reporting (MOR)

Voluntary reporting systems

Confidential reporting channels

Reporting protection & just culture

Data collection tools

Module 4: Safety Risk Assessment & Analysis Tools

- Risk matrices
- Bow-tie analysis
- 5 Why method
- Fishbone diagram
- HFACS model
- Trend analysis

Module 5: Safety Performance Management

- Safety Performance Indicators (SPIs)
- Safety Performance Targets (SPTs)
- Leading vs lagging indicators
- Data-driven safety monitoring
- Safety Review Board (SRB)

Module 6: Emergency Response Planning (ERP)

- ERP structure
- Crisis communication
- Media handling
- Coordination with authorities
- Post-incident recovery)
  Table-top simulation exercise included

Module 7: Human Factors in SMS

- Human performance & limitations
- SHELL model
- Dirty Dozen
- Fatigue risk management
- Organizational culture

Module 8: SMS & Compliance Monitoring Integration

- SMS vs QMS
- Compliance Monitoring System (CMS)
- Audit process
- Root cause analysis
- Corrective & preventive actions

Module 10: Data Protection, Ethics & Enforcement

- Confidentiality of safety data
- Regulatory enforcement
- Accountability vs blame
- Whistleblower protection

Module 11: Practical Workshops & Case Studies

- Accident case study analysis
- Risk assessment practical
- Hazard reporting exercise
- Mock Safety Review Board meeting
- Audit simulation

4. First Aid Training

Module 1: Introduction to First Aid in Aviation

- Importance of first aid in aviation operations
- Legal & regulatory responsibilities
- Roles of crew during medical emergencies
- Aviation medical kit contents (FAK & EMK)
- Communication with medical support (MedLink / ground medical advisory)

Module 2: Basic Human Anatomy & Physiology

- Respiratory system
- Cardiovascular system
- Nervous system
- Shock mechanism
- Effects of altitude & hypoxia

Module 3: Basic Life Support (BLS)

3.1 CPR (Cardio-Pulmonary Resuscitation)

- Adult CPR
- Child & infant CPR
- Compression & ventilation ratios
- AED (Automated External Defibrillator) usage

3.2 Airway Management

- Recovery position
- Choking management (Heimlich maneuver)
- Airway obstruction recognition
  Practical session mandatory

Module 4: Management of Medical Emergencies Onboard

- Fainting & unconsciousness
- Heart attack symptoms
- Stroke recognition
- Seizures
- Asthma attack
- Allergic reactions (Anaphylaxis)
- Diabetic emergencies
- Dehydration

Module 5: Bleeding & Wound Management

- Types of bleeding
- Control of hemorrhage
- Bandaging techniques
- Use of sterile dressing
- Nosebleeds

Module 6: Fractures, Sprains Burns

- Types of fractures
- Immobilization techniques
- Splinting
- Thermal burns
- Chemical burns
- Electrical burns

Module 7: In-Flight Specific Medical Considerations

- Cabin pressure effects
- Turbulence injuries
- Smoke inhalation
- Food poisoning
- Communicable diseases onboard
- Passenger with reduced mobility (PRM) consideration)

Module 8: Psychological First Aid

- Panic attack management
- Stress reaction
- Passenger aggression management
- Emotional support during crisis

Module 9: Infection Prevention & Control

- Universal precautions
- PPE usage
- Biohazard disposal
- Post-exposure procedures

Module 10: Emergency Equipment Familiarization

- First Aid Kit (FAK)
- Emergency Medical Kit (EMK)
- AED
- Oxygen bottles
- Stretcher usage
  Hands-on equipment demonstration required
- Oxygen bottles

Module 7: Incident Reporting & Documentation

- Cabin report documentation
- Engineering injury reporting
- Regulatory reporting requirements
- Confidentiality & data protection

PRACTICAL TRAINING REQUIREMENTS

- CPR manikin practice
- AED simulation
- Bandaging & splinting practice
- Emergency scenario simulation
- Mock onboard medical emergency

5. HumanFactors Training

Module 1:Introduction to Human Factors

- Definition of Human Factors
- Evolution of aviation safety
- Accident causation models
- Evolution of aviation safety

Module 2:HumanPerformance & Limitations

- 2.1 Physical Factors
  - Vision & hearing
  - Circadian rhythm
  - Fatigue & sleep
  - Stress
- 2.2 Psychological Factors
  - Perception
  - Attention &distraction
  - Memorylimitations
  - Decision-making

Module 3:TheSHELLModel

- Software
- Hardware
- Software
- Hardware
- Environment
- Liveware
- Liveware–Liveware interaction
  Practical example discussions

Module 4:HumanError

- Types of errors (Slip, Lapse, Mistake, Violation)
- Active vs latent failures
- Swiss Cheese Model
- Error chain concept
  Case study analysis included

Module 5:TheDirty Dozen

- Lack of communication
- Lack of knowledge
- Lack of teamwork
- Lack of resources
- Lack of assertiveness
- Lack of awareness
- Complacency
- Distraction
- Fatigue
- Pressure
- Stress
- Norms
  Practical identification exercises

Module 6:Communication& Teamwork

- Effective communication techniques
- Briefings & debriefings
- Multi-national crew considerations
- Closed-loop communication
- Cultural awareness

Module 7:Leadership & Followership

- Leadership styles
- Assertiveness
- CRM&TEM(ThreatandError Management)
- Authority gradient
- Conflict resolution

Module 8:Situational Awareness & Decision Making

- Levels of situational awareness
- Threat identification
- Risk-based decision making
- Confirmation bias Scenario-based discussion

Module 9:FatigueRisk Management

- Causes of fatigue
- Effects on performance
- Fatigue mitigation strategies
- FRMSoverview

Module 10:Safety Culture & Just Culture

- Organizational culture
- Reporting culture
- Accountability vs blame
- Safety reporting systems

Module 11:HumanFactors in Maintenance (Maintenance Resource Management– MRM)

- Shift handover
- Tool control
- Task interruption
- Documentation accuracy
- Certification responsibility

Module 12:HumanFactors in Flight Operations (CRM)

- Crew coordination
- Workload management
- Threat & error management
- Automation dependency

Module13:HumanFactors in Ground & Engineering Operations

- Rampsafety
- Communication with cockpit
- Human-machine interface
- Maintenance documentation errors

Module 14:Practical Case Studies

- Major aviation accident analysis
- Maintenance error case study
- Accountability vs blame
- Group discussion & risk identification

EDTO Maintenance Training

Module 1:Introduction to EDTO / ETOPS

- Definition of EDTO
- Evolution from ETOPS to EDTO
- Regulatory background
- Diversion time concepts (60, 120, 180, 240+ minutes)
- Types of EDTO operations

Module 2:Regulatory Framework

- ICAO Annex 6 EDTOprovisions
- EASA Air OPS EDTO requirements
- FAA ETOPS rule overview
- DGCACAREDTOrequirements
- GCC regulatory variations
- Approval process for EDTO

Module 3:EDTOConfiguration, Maintenance & Procedures (CMP)

- EDTO CMPdocumentconcept
- Type Certificate holder requirements
- Aircraft system reliability
- Compliance with CMP standards

Module 4:Aircraft Systems Critical to EDTO

4.1 Propulsion System

- Engine reliability
- IFSD rate monitoring
- Oil consumption control

4.2 Electrical System

- Dual power source reliability
- APUperformance requirements

4.3 Fuel System

- Fuel cross-feed
- Fuel monitoring
- Fuel leak prevention

4.4 Fire Suppression System

- Cargo compartment fire suppression duration
- EDTO fire bottle requirements

4.5 Air Conditioning & Pressurization

Module 5:Reliability Program

- EDTO reliability control program
- Engine condition monitoring
- Trend monitoring
- Reliability reporting
- Threshold levels
- Corrective action procedures

Module 6:Maintenance Program Requirements

- EDTO-specific tasks
- Pre-departure service checks
- Dual maintenance concept
- Significant system verification

Module 7:MEL&Dispatch Considerations

- EDTO MELrestrictions
- EDTO significant systems
- Dispatch limitations
- Deferred defects in EDTO

Module 8:Pre-Departure Service Check (PDSC)

- Purpose of PDSC
- Scope of inspection
- Certification requirements
- Documentation procedures

Module 9:Maintenance Error Prevention

- Humanfactors in EDTO
- Dual inspection requirements
- Independent verification
- Tool control
- Documentation accuracy

Module 10:APU&EngineStart Capability

- APUin-flight start envelope
- Cold soak limitations
- Oil temperature monitoring
- ETOPS critical parts management

Module 11:EDTOTraining & Qualification Requirements

- Initial EDTO training
- Recurrent training (every 24 months)
- Qualification of certifying staff
- Maintenance controller training

Module 12:Quality & Compliance Oversight

- Internal audit requirements
- EDTO program audit
- Authority oversight
- Occurrence reporting

Module 13:Emergency &Diversion Considerations

- Diversion airport requirements
- Time-limited systems
- Decision-making during diversion
- Post-diversion maintenance inspection

Module 14:Practical Workshops

- Case study: Engine IFSD event
- Reliability trend analysis exercise
- MELscenario evaluation
- EDTO PDSCpractical simulation
- Audit checklist exercise

CAR-147 Type-Rated Training

Module 1–Regulatory Framework & Approval Requirements

- ICAO Annex 1 &Annex6requirements
- Part-147 / CAR-147 approval structure
- Part-66 / AML categories (B1, B2, C)t
- Differences: EASA vs FAA vs DGCA vs GCAA vs CASA
- Training organization responsibilities
- Quality system & compliance monitoring
- Examination & certification procedures
- Aircraft type rating endorsement process

Module 2–Aircraft General Familiarization (Level 1)

- Aircraft overview
- Principal dimensions & weights
- Powerplant type
- Flight deck layout
- Major systems summary
- Maintenance documentation structure (AMM, IPC, SRM, WDM, FIM, TSM)
- MEL/CDL concepts

Module 3–Detailed Theoretical Training (Level 3)

(As per ATA Chapters– minimum Level 3 for B1/B2)

3.1 Airframe Systems

- ATA 05–TimeLimits & Maintenance Checks
- ATA 06–Dimensions & Areas
- ATA 07–Lifting & Shoring
- ATA 08–Leveling & Weighing
- ATA 09–Towing &Taxiing
- ATA 10–Parking & Mooring
- ATA 11–Placards & Markings
- ATA 12–Servicing

3.2 Powerplant Systems

- ATA 71–80 (Engine systems)
- FADEC / Engine Control Systems
- Engine performance & limitations
- Oil system
- Fuel system

3.3 Avionics Systems

- ATA 22–AutoFlight
- ATA 23–Communications
- ATA 24–Electrical Power
- ATA 31–Instruments
- ATA 34–Navigation
- ATA 42–Integrated Modular Avionics

3.4 Aircraft Systems

- ATA 21–Air Conditioning
- ATA 27–Flight Controls
- ATA 28–Fuel
- ATA 29–Hydraulic
- ATA 30–Ice &Rain Protection
- ATA 32–Landing Gear
- ATA 35–Oxygen
- ATA 36–Pneumatic
- ATA 38–Water/Waste
- ATA 49–APU
- ATA 52–Doors
- ATA 53–Fuselage
- ATA 57–Wings

Module 4–Practical Training (Hands-On)

Mandatory practical training covering:

- Access & close-up procedures
- System operational tests
- Troubleshooting (FIM use)
- BITE testing
- Component removal & installation
- Rigging checks
- Engine ground run (if applicable)
- Borescope inspection
- Electrical fault tracing
- Use of special tools & GSE
- MELapplication scenarios

Minimum practical hours:

- As per EASA: 2–4 weeks minimum
- DGCAIndia: As per CAR 147 Appendix III
- FAA: Based on OJT requirements
- Oil system
- CASA/TCCA: Structured practical assessment required

Module 5–HumanFactors &Error Management (Type-Specific Context)

- HF in type maintenance
- Case studies of type-related incidents
- Dirty Dozen application
- Shift handover in type operations
- Communication errors in complex aircraft
- Fatigue & decision making

Module 6–Safety Management & Risk Assessment

- SMS in maintenance organization
- Type-specific risk areas
- Critical task control
- Duplicate inspection requirements
- Independent inspection
- HF reporting integration

Module 7–EWIS&FuelTankSafety (FTS)

- Mandatory for:
  - EASA / UK/DGCA/CASA/GCAA
- Includes:
  - EWIS zoning
  - Wiring contamination & inspection
  - FTS Phase 1 &Phase 2
  - CDCCL compliance
  - SFAR 88 concept

Module 8–Engine Run &Taxi Training (If Applicable)

- Safety area setup
- Fire precautions
- Communication procedures
- High power run safety
- Run-up troubleshooting
- Taxi authorization limitations

CAR-M Subpart (G) CAMO On-Job Training

Module 1–Regulatory Framework & Continuing Airworthiness System

- ICAO Annex 6 continuing airworthiness requirements
- Part-M Subpart G / Part-CAMO structure
- Air Operator Certificate (AOC) linkage
- Differences: EASA vs FAA vs DGCA vs CASA vs GCAA
- ARC (Airworthiness Review Certificate) process
- Responsibilities of CAMO
- Contracted vs in-house maintenance

Module 2–CAMOOrganization& Responsibilities

- Accountable Manager responsibilities
- Nominated Post Holders
- Continuing Airworthiness Manager
- Airworthiness Review Staff (ARS)
- Technical Records section
- Planning department
- Reliability & Engineering section
- Quality & Compliance Monitoring

Module 3–Aircraft Technical Records Management

Practical OJT Tasks:

- Logbook review
- AD status control
- SB evaluation & embodiment tracking
- LLP (Life Limited Parts) control
- Hard Time vs On Condition tasks
- Component control register
- Modification status
- Weight & Balance records
- Digital record systems

Module 4–Airworthiness Directives & Service Bulletins

- ADclassification (Emergency / Mandatory / Recommended)
- ADapplicability research t(FAA, EASA, DGCA etc.)
- AMOCconcept
- SB technical evaluation
- Cost-benefit & risk analysis
- Regulatory acceptance differences

Module 5–Maintenance Programme Management

- AMP development (MPD based)
- MRB concept
- Escalation procedures
- Bridging checks
- Task interval control
- Maintenance check packaging
- Engine/APU shop visit planning
- Structural inspection program
- Aging aircraft considerations

Module 6–Reliability Programme & Trend Monitoring

- Reliability control board
- Data collection
- Delay & defect trend analysis
- IFSD rate monitoring
- Alert levels & corrective action
- ETOPS/EDTO reliability (if applicable)
- Practical:

→ Analyze defect data & prepare reliability report

Module 7–Defect Control & MEL/ CDL Management

- MEL approval & revision
- CDL application
- Deferred defect trackingt
- Repetitive defect control
- AOG coordination
- Technical dispatch support

Module 8–Contracted Maintenance Oversight

- Part-145 / CAR-145 coordination
- Work order preparation
- CRS verification
- Release to Service validation
- Subcontractor evaluation
- Vendor approval process
- Practical:
  - → Audit checklist preparation
  - → Review CRS for compliance

Module 9–Airworthiness Review & ARC Process

- Physical aircraft survey
- Record review
- Sampling methodology
- Statement of conformity
- ARC issuance / recommendation
- Import/export CofA

Module 10–SMS & Risk Management in CAMO

- Safety reporting
- Occurrence investigation
- Risk assessment matrix
- HF integration in planning
- Continued operational safety

Module 11–Quality & Compliance Monitoring

- Internal audit planning
- Findings classification (Level 1 / Level 2)
- Root cause analysis
- Corrective action follow-up
- Authority audits preparation

Module 12–Aircraft Induction / Transition / Lease Return

- Records audit
- Bridging check planning
- Phase-in / Phase-out management
- Lease return technical condition
- End-of-lease package preparation

CAR-145 On-Job Training

Module 1–Regulatory Framework & MOEFamiliarization

- ICAO Annex 6 maintenance requirements
- Part-145 / CAR-145 structure
- Scope of approval & capability list
- Differences: EASA vs FAA vs DGCA vs CASA vs GCAA
- Maintenance Organisation Exposition (MOE)
- Quality system & compliance monitoring
- HumanFactors & SMS integration

Module 2–Organization Structure & Responsibilities

- Accountable Manager
- Maintenance Manager
- Quality Manager
- Base vs Line maintenance
- Certifying Staff privileges
- CRS issuance authority
- Tool control & stores control

Module 3–Aircraft Documentation & Technical Publications

- AMM,IPC, SRM, CMM
- WDM,FIM,TSM
- MEL/CDL usage
- AD & SBcompliance
- Engineering Orders
- Revision control system

Module 4–Maintenance Planning & Work Package Control

- Work order preparation
- Task card generationt
- Check package preparation
- Man-hour estimation
- CRS review process
- Deferred defect control

Module 5–Aircraft Maintenance Tasks (Hands-On Core OJT)

Minimum task exposure must include:

Airframe

- Panel removal & installation
- Structural inspection
- Corrosion treatment
- Flight control inspection

Powerplant

- Engine servicing
- Filter replacement
- Borescope inspection
- Oil servicing
- Engine ground run (if authorized)

Electrical/Avionics

- Wiring inspection
- LRU replacement
- BITE test
- Fault isolation

Landing Gear

- Tire change
- Brake inspection
- Strut servicing

Fuel System

- Fuel panel operation
- Leak check
- Refueling supervision

Landing Gear

- Tire change
- Brake inspection
- Strut servicing

Module 6–Troubleshooting & Defect Rectification

- Fault isolation methodology
- Use of FIM
- Use of BITE
- Rectification recording
- Repetitive defect control

Module 7–Certification & CRSProcedures

- Certificate of Release to Service (CRS)
- Dual inspection
- Independent inspection
- Critical task control
- Shift handover procedures

Module 8–Tooling, Calibration & Stores

- Tool control procedure
- Calibration system
- Shelf-life control
- Life-limited parts
- Stores quarantine process

Module 9–Safety, Human Factors & SMS in Maintenance

- Human error in maintenance
- Dirty Dozen
- Reporting culture
- PPE usage
- Ramp safety
- FOD control

Module 10–Quality & Audit Exposure

- Internal audit process
- Finding classification
- Root cause analysis
- Corrective action
- Authority audit preparation

Module 11–Specialized Approvals (If Applicable)

- Certificate of Release to Service (CRS)
- Dual inspection
- Independent inspection
- Critical task control
- Shift handover procedures

Module 8–Tooling, Calibration & Stores

- Tool control procedure
- Calibration system
- Shelf-life control
- Life-limited parts
- Stores quarantine process

Module 9–Safety, Human Factors & SMS in Maintenance

- Human error in maintenance
- Dirty Dozen
- Reporting culture
- PPE usage
- Ramp safety
- FOD control

Module 10–Quality & Audit Exposure

- Internal audit process
- Finding classification
- Root cause analysis
- Corrective action
- Authority audit preparation

NDT Classes (Non-Destructive Testing)

Module 1–NDTGeneral Theory (CommonCore)

Mandatory for all methods.

- Material science basics
- Aircraft structural construction
- Crack propagation
- Discontinuity classification
- Safety precautions in NDT
- Metallic vs composite materials
- Corrosion types
- Fatigue & stress concentration
- NDTreliability & probability of detection (POD)

Module 2–Liquid Penetrant Testing (PT) Theory:

- Principles of capillary action
- Emulsifiers
- Sensitivity levels
- Practical
- Types of penetrants
- Developers
- Indications vs false indications
  - Surface preparation
  - Application methods
  - Dwell time control
  - Developer application
  - Indication interpretation
  - Reporting

Module 3–MagneticParticle Testing (MT) Theory

Theory:

- Magnetic fields
- Types of magnetization
- AC/DC methods
- Particle types
- Demagnetization
- Field strength measurement

Practical

- Yoke inspection
- Coil technique
- Circular magnetization
- Longitudinal magnetization
- Interpretation & reporting

Module 4–Eddy Current Testing t(ET)

Theory:

- Electromagnetic induction
- Impedance plane
- Frequency selection
- Conductivity measurement
- Lift-off effect
- Crack detection in fastener holes

Practical

- Surface crack detection
- Sub-surface flaw detection
- Bolt hole inspection
- Calibration block usage
- Signal interpretation

Module 5–Ultrasonic Testing t(UT)

Theory:

- Sound wave propagation
- Reflection & refraction
- Beamspread
- Attenuation
- Couplants
- A-scan principles

Practical

- Straight beam inspection
- Angle beam inspection
- Thickness measurement
- Calibration procedures
- Indication evaluation

Module 6–Radiographic Testing (RT) (If Applicable)

Theory:

- X-ray generation
- Gamma sources
- Film & digital radiography
- Exposure techniques
- Radiation safety
- Image quality indicators

Practical

- Exposure setup
- Film processing
- Image interpretation
- Radiation protection procedures

Module 7–Composite &Advanced NDT (Optional / Advanced)

- Bond testing
- Tap testing
- Phased Array UT
- Thermography
- Shearography
- Structural health monitoring basics

Module 8 – Aviation Application & tCase Studies

- Typical aircraft structural defects
- Engine component NDT
- Landing gear inspections
- Propeller inspections
- Wheel & brake inspections
- Aging aircraft programs

Module 9 – Quality Control Documentation

- Written Practice preparation
- Procedure qualification
- Equipment calibration
- Control of NDT consumables
- Audit preparation
- Authority surveillance

EG PWS Training (Enhanced Ground Proximity Warning System)

Module 1 – System Overview & Architecture

- GPWS vs EGPWS vs TAWS
- Display integration (ND / PFD / MFD)
- Aural warning system
- System redundancy
- System components
  - Terrain database
  - Radio altimeter inputs
  - Air data inputs
  - GPS inputs
  - Flight management system interface
- Data update requirements

Module 2– Modes of Operation

- Classical GPWS Modes
  - Mode 1 – Excessive Descent Rate
  - Mode 2 – Excessive Terrain Closure Rate
  - Mode 3 – Altitude Loss After Takeoff
  - Mode 4 – Unsafe Terrain Clearance
  - Mode 5 – Excessive Glideslope Deviation
  - Mode 6 – Advisory Callouts
- System components
  - Terrain database
  - Radio altimeter inputs
  - Air data inputs
  - GPS inputs
  - Flight management system interface
- EGPWS Enhanced Modes
  - Terrain Look-Ahead Alerting
  - Obstacle Database Alerting
  - Premature Descent Alert (PDA)
  - Terrain Awareness Display

Module 3 – Alerting Logic & Crew Response (Flight Crew Focus)

- Caution vs Warning alerts
- “PULL UP” response
- Terrain display interpretation
- Controlled Flight Into Terrain (CFIT) case studies
- “TERRAIN TERRAIN”
- Standard escape maneuver
- Nuisance alerts & mitigationt

Module 4 – Maintenance & Troubleshooting (Technical Focus)

- Built-In Test Equipment (BITE)
- Database validation
- System tests & functional checks
- Configuration control
- Fault isolation using FIM
- LRU replacement
- Wiring inspection

Module 5 – Installation & Airworthiness Considerations

- STC approval
- Radio altimeter interface
- ETOPS/EDTO considerations
- Wiring & antenna installation
- Software configuration controlt
- Weight & balance considerations

Module 6 – Terrain & Obstacle Database Management

- Database structure
- Revision control
- Data loading procedures
- Update cycles
- Cross-check procedures
- Regulatory requirements for database currency

Module 4 – Maintenance & Troubleshooting (Technical Focus)

- Built-In Test Equipment (BITE)
- Database validation
- System tests & functional checks
- Configuration control
- Fault isolation using FIM
- LRU replacement
- Wiring inspection

Module 5 – Installation & Airworthiness Considerations

- STC approval
- Radio altimeter interface
- ETOPS/EDTO considerations
- Wiring & antenna installation
- Software configuration controlt
- Weight & balance considerations

Module 6 – Terrain & Obstacle Database Management

- Database structure
- Revision control
- Data loading procedures
- Update cycles
- Cross-check procedures
- Regulatory requirements for database currency

Module 7 – Human Factors & Safety Considerations

- CFIT accident case studies
- Startle effect
- Automation dependency
- Alert fatigue
- CRM integration
- Reporting EGPWS events

Module 8 – MEL & Dispatch Considerations

- MEL categories
- Dispatch relief provisions
- Deferred defect management
- Operational limitations
- ETOPS dispatch consideration

EG PWS Training (Enhanced Ground Proximity Warning System)

Module 1 – International Aviation Regulatory Framework

Objectives

- Provide foundation of global aviation regulatory structure.

Topics

- ICAO SARPs (Annex 1, 6, 8, 19)
- State responsibilitiest
- Differences between EASA, FAA, DGCA, CASA
- Bilateral agreements (BASA/TIP)
- Airworthiness vs Operational approvals
- Regulatory oversight & surveillance

Module 2 – CAR-21 / Part-21 (Design & Production)

- DOA / POA concepts
- Minor vs Major modification
- Form 1 / 8130-3 / equivalent tags
- AD issuance process
- Type Certificate & STC
- Repair approval process
- Continued operational safety (COS)

Module 3 – CAR-145 / Part-145 (Maintenance Organization)

- Approval requirements
- Scope of approval
- CRS issuance
- Stores & shelf life
- Occurrence reporting
- MOE structure
- Certifying staff authorization
- Tool & equipment control
- Contracted maintenance control

Module 4 – CAR-M / CAMO (Continuing Airworthiness)

- Continuing Airworthiness responsibilities
- AD/SB control
- Reliability program
- Technical records control
- AMP development
- ARC process
- MEL management

Module 5 – CAR-147 (Training Organization)

- Approval requirements
- Examination control
- Instructor qualification
- Certificate of Recognition issuance
- Training procedures
- Practical assessment
- Quality system in training

Module 6 – CAR-66 / AML Licensing

- License categories (A, B1, B2, C)
- Experience requirements
- Limitations removal
- Type rating endorsement
- OJT requirements
- Differences between EASA, FAA A&P, CASA LAME

Module 7 – AAC (Airworthiness Administration & Control)

- Records management
- Document revision system
- Import/export CofA
- Compliance matrix development
- Configuration control
- Authority correspondence
- Aircraft lease transition

Module 8 – Human Factors (HF)

- Dirty Dozen
- Fatigue management
- Safety culture
- Error models (SHELL, Swiss Cheese)
- Communication & teamwork
- Maintenance error case studies

Module 9 – Safety Management System (SMS)

- ICAO Annex 19
- Hazard identification
- Safety performance indicators (SPIs)
- Emergency response planning
- Safety policy
- Risk assessment matrix
- Occurrence reporting
- Safety assurance

Module 10 – Compliance Monitoring & Audit

- Internal audit planning
- Finding classification
- Root cause analysis
- Corrective & preventive actions
- Authority audit preparation
- Management review

Module 11 – Leadership & Post Holder Responsibilities

- Accountable Manager role
- Compliance responsibility
- Delegation & authority
- Decision-making under regulatory pressure
- Crisis management

Module 12 – International Regulatory Differences & Harmonization

- EASA vs FAA differences
- DGCA vs EASA adaptation
- GCC harmonization
- CASA & TCCA differences
- Bilateral acceptance
- Managing multi-approval organizations

Quality Department On-Job Training

Module 1 – Regulatory Framework & International Aviation Law

- ICAO Annex 6 & Annex 8 overviewt
- CAR-M / Part-M / Part-CAMO overview
- CAR-21 / Part-21 basics
- CAR-66 licensing overview
- Bilateral Aviation Safety Agreements (BASA)
- Differences between
  - EASA Part-145
  - UK Part-145
  - FAA 14 CFR Part 145
  - DGCA CAR-145 (India)
  - GCAA CAR-145
  - GACA Part-145
  - CASA CASR 145

Module 2 – Maintenance Organisation Exposition (MOE) Control

- MOE Part 1 – Management
- MOE Part 2 – Maintenance Procedures
- MOE Part 3 – Quality System
- MOE Part 4 – Contracts
- Amendment proceduret
- Approval and submission process to authority

Module 3 – Quality Management System (QMS)

- Quality policy
- Compliance monitoring
- Internal audit system
- Audit planning & scheduling
- Audit reporting
- Corrective & preventive actions
- Root Cause Analysis (5 Why, Fishbone)
- Risk-based auditing

Module 4 – Safety Management System (SMS)

- ICAO SMS Framework
- Hazard identification
- Risk assessment matrix
- Safety reporting system
- Occurrence reporting (EASA/FAA/UK/India requirements)
- Just culture
- Safety performance indicators (SPIs)

Module 5 – Audit Techniques & Regulatory Inspections

- Regulatory audit preparation
- Authority surveillance process
- Handling Level 1 & Level 2 findings
- FAA/EASA ramp inspections
- Audit documentation
- Interview techniques

Module 6 – Certifying Staff & Authorisation Control

- CAR-66 / Part-66 licensing
- Type training verification
- Experience requirements (6 months in 2 years rule)
- One-time authorisation
- Competency assessment
- Human Factors training validity
- EWIS / FTS requirements

Module 7 – Technical Records & Documentation Control

- CRS (Certificate of Release to Service)
- ARC support documentation
- Work orders & task cards
- Logbook entries
- AD/SB compliance control
- Technical record retention
- Digital record control

Module 8 – Occurrence Reporting & Continued Airworthiness

- Mandatory Occurrence Reporting (MOR)
- Service Difficulty Reports (FAA)
- Continued Operational Safety
- Reporting timelines
- Investigation procedures

Module 9 – Human Factors & Just Culture

- Dirty Dozen
- Human performance & limitations
- Error management
- HF in auditing
- Safety culture
- Fatigue management

Module 10 – Stores & Tool Contro Oversight

- Shelf life control
- Calibration control
- Tool segregation
- Quarantine procedures
- Traceability (Form 1 / 8130-3 / equivalent)
- Supplier approval

Module 11 – Training & Competency System

- Initial & recurrent training
- HF/SMS continuation
- OJT records
- Instructor approval
- Training matrix

Module 12 – Risk-Based & Performance \Based Oversight

- Risk-based surveillance
- Safety performance monitoring
- KPI tracking
- Trend analysis
- Data-driven oversight

Module 13 – Management & Regulatory Interface

- Regulatory meetings
- Response letters drafting
- Compliance statements
- Approval renewals
- Exposition acceptance