	LEVEL			
	A	B1	B2	B3
10.6 **Continuing airworthiness**	2	2	2	2
Detailed understanding of Part-21 provisions related to continuing airworthiness.				
Detailed understanding of Part-M.				
10.7 **Applicable National and International Requirements for** (if not superseded by EU requirements).				
(a) Maintenance Programmes, Maintenance checks and inspections;	1	2	2	2
Airworthiness Directives;				
Service Bulletins, manufacturers service information;				
Modifications and repairs;				
Maintenance documentation: maintenance manuals, structural repair manual, illustrated parts catalogue, etc.;				
Only for A to B2 licences:				
Master Minimum Equipment Lists, Minimum Equipment List, Dispatch Deviation Lists;				
(b) Continuing airworthiness;	—	1	1	1
Minimum equipment requirements — Test flights;				
Only for B1 and B2 licences:				
ETOPS, maintenance and dispatch requirements;				
All Weather Operations, Category 2/3 operations.				

MODULE 11A. TURBINE AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

	LEVEL	
	A1	B1.1
11.1 **Theory of Flight**		
11.1.1. *Aeroplane Aerodynamics and Flight Controls*	1	2
Operation and effect of: — roll control: ailerons and spoilers, — pitch control: elevators, stabilators, variable incidence stabilisers and canards, — yaw control, rudder limiters;		
Control using elevons, ruddervators;		
High lift devices, slots, slats, flaps, flaperons;		
Drag inducing devices, spoilers, lift dumpers, speed brakes;		

	LEVEL	
	A1	B1.1
Effects of wing fences, saw tooth leading edges;		
Boundary layer control using, vortex generators, stall wedges or leading edge devices;		
Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.		
11.1.2. *High Speed Flight*	1	2
Speed of sound, subsonic flight, transonic flight, supersonic flight;		
Mach number, critical Mach number, compressibility buffet, shock wave, aerodynamic heating, area rule;		
Factors affecting airflow in engine intakes of high speed aircraft;		
Effects of sweepback on critical Mach number.		
11.2 **Airframe Structures — General Concepts**		
(a) Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail safe, safe life, damage tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning strike protection provision; Aircraft bonding.	2	2
(b) Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments; Structure assembly techniques: riveting, bolting, bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks.	1	2
11.3 **Airframe Structures — Aeroplanes**		
11.3.1 *Fuselage (ATA 52/53/56)*	1	2
Construction and pressurisation sealing;		
Wing, stabiliser, pylon and undercarriage attachments;		

	LEVEL	
	A1	B1.1
Seat installation and cargo loading system; Doors and emergency exits: construction, mechanisms, operation and safety devices; Windows and windscreen construction and mechanisms.		
11.3.2 *Wings (ATA 57)*	1	2
Construction; Fuel storage; Landing gear, pylon, control surface and high lift/drag attachments.		
11.3.3 *Stabilisers (ATA 55)*	1	2
Construction; Control surface attachment.		
11.3.4 *Flight Control Surfaces (ATA 55/57)*	1	2
Construction and attachment; Balancing — mass and aerodynamic.		
11.3.5 *Nacelles/Pylons (ATA 54)*	1	2
Nacelles/Pylons: — Construction, — Firewalls, — Engine mounts.		
11.4 **Air Conditioning and Cabin Pressurisation (ATA 21)**		
11.4.1 *Air supply*	1	2
Sources of air supply including engine bleed, APU and ground cart.		
11.4.2 *Air Conditioning*	1	3
Air conditioning systems; Air cycle and vapour cycle machines; Distribution systems; Flow, temperature and humidity control system.		
11.4.3 *Pressurisation*	1	3
Pressurisation systems; Control and indication including control and safety valves; Cabin pressure controllers.		

	LEVEL	
	A1	B1.1
11.4.4 *Safety and warning devices*	1	3
Protection and warning devices.		
11.5 **Instruments/Avionic Systems**		
11.5.1 *Instrument Systems (ATA 31)*	1	2
Pitot static: altimeter, air speed indicator, vertical speed indicator;		
Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator;		
Compasses: direct reading, remote reading;		
Angle of attack indication, stall warning systems;		
Glass cockpit;		
Other aircraft system indication.		
11.5.2 *Avionic Systems*	1	1
Fundamentals of system lay-outs and operation of: — Auto Flight (ATA 22), — Communications (ATA 23), — Navigation Systems (ATA 34).		
11.6 **Electrical Power (ATA 24)**	1	3
Batteries Installation and Operation;		
DC power generation;		
AC power generation;		
Emergency power generation;		
Voltage regulation;		
Power distribution;		
Inverters, transformers, rectifiers;		
Circuit protection;		
External/Ground power.		
11.7 **Equipment and Furnishings (ATA 25)**		
(a) Emergency equipment requirements; Seats, harnesses and belts.	2	2

	LEVEL	
	A1	B1.1
(b) Cabin lay-out; Equipment lay-out; Cabin Furnishing installation; Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment; Airstairs.	1	1
11.8 **Fire Protection (ATA 26)**	1	3
(a) Fire and smoke detection and warning systems; Fire extinguishing systems; System tests;		
(b) Portable fire extinguisher.	1	1
11.9 **Flight Controls (ATA 27)**	1	3
Primary controls: aileron, elevator, rudder, spoiler;		
Trim control;		
Active load control;		
High lift devices;		
Lift dump, speed brakes;		
System operation: manual, hydraulic, pneumatic, electrical, fly-by-wire;		
Artificial feel, Yaw damper, Mach trim, rudder limiter, gust lock systems;		
Balancing and rigging;		
Stall protection/warning system.		
11.10 **Fuel Systems (ATA 28)**	1	3
System lay-out;		
Fuel tanks;		
Supply systems;		
Dumping, venting and draining;		
Cross-feed and transfer;		
Indications and warnings;		
Refuelling and defuelling;		
Longitudinal balance fuel systems.		

	LEVEL	
	A1	B1.1
11.11 **Hydraulic Power (ATA 29)**	1	3
System lay-out;		
Hydraulic fluids;		
Hydraulic reservoirs and accumulators;		
Pressure generation: electric, mechanical, pneumatic;		
Emergency pressure generation;		
Filters;		
Pressure Control;		
Power distribution;		
Indication and warning systems;		
Interface with other systems.		
11.12 **Ice and Rain Protection (ATA 30)**	1	3
Ice formation, classification and detection;		
Anti-icing systems: electrical, hot air and chemical;		
De-icing systems: electrical, hot air, pneumatic and chemical;		
Rain repellent;		
Probe and drain heating;		
Wiper systems.		
11.13 **Landing Gear (ATA 32)**	2	3
Construction, shock absorbing;		
Extension and retraction systems: normal and emergency;		
Indications and warning;		
Wheels, brakes, antiskid and autobraking;		
Tyres;		
Steering;		
Air-ground sensing.		
11.14 **Lights (ATA 33)**	2	3
External: navigation, anti collision, landing, taxiing, ice;		
Internal: cabin, cockpit, cargo;		
Emergency.		

	LEVEL	
	A1	B1.1
11.15 **Oxygen (ATA 35)**	1	3
System lay-out: cockpit, cabin;		
Sources, storage, charging and distribution;		
Supply regulation;		
Indications and warnings.		
11.16 **Pneumatic/Vacuum (ATA 36)**	1	3
System lay-out;		
Sources: engine/APU, compressors, reservoirs, ground supply;		
Pressure control;		
Distribution;		
Indications and warnings;		
Interfaces with other systems.		
11.17 **Water/Waste (ATA 38)**	2	3
Water system lay-out, supply, distribution, servicing and draining;		
Toilet system lay-out, flushing and servicing;		
Corrosion aspects.		
11.18 **On Board Maintenance Systems (ATA 45)**	1	2
Central maintenance computers;		
Data loading system;		
Electronic library system;		
Printing;		
Structure monitoring (damage tolerance monitoring).		
11.19 **Integrated Modular Avionics (ATA42)**	1	2
Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others:		
Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc.		
Core System; Network Components.		

	LEVEL	
	A1	B1.1
11.20 **Cabin Systems (ATA44)**	1	2
The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (Cabin Intercommunication Data System) and between the aircraft cabin and ground stations (Cabin Network Service). Includes voice, data, music and video transmissions.		
The Cabin Intercommunication Data System provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRU's and they are typically operated via Flight Attendant Panels.		
The Cabin Network Service typically consists on a server, typically interfacing with, among others, the following systems: — Data/Radio Communication, In-Flight Entertainment System.		
The Cabin Network Service may host functions such as: — Access to pre-departure/departure reports, — E-mail/intranet/Internet access, — Passenger database;		
Cabin Core System;		
In-flight Entertainment System;		
External Communication System;		
Cabin Mass Memory System;		
Cabin Monitoring System;		
Miscellaneous Cabin System.		
11.21 **Information Systems (ATA46)**	1	2
The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. Does not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display.		
Typical examples include Air Traffic and Information Management Systems and Network Server Systems		
Aircraft General Information System;		
Flight Deck Information System;		
Maintenance Information System;		
Passenger Cabin Information System;		
Miscellaneous Information System.		