Part 66 B1.2 AME Aeroplane Trade Syllabi and Learning Levels

Nominal Course hours: 2000 hours. Source: Appendix 1, EASR Part 147

Compiled from CASR Part 66 MoS Licencing: Module 10 at end. P0st Trade

Subject modules		A or B1 aeroplane with:		A or B1 helicopter with:		B2
		Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	Avionics
1	Mathematics	X	X	X	X	X
2	Physics	X	X	X	X	X
3	Electrical fundamentals	X	X	X	X	X
4	Electronic fundamentals	X	X	X	X	X
5	Digital techniques electronic instrument systems	X	X	X	X	X
6	Materials and hardware	X	X	X	X	X
7	Maintenance practices	X	X	X	X	X
8	Basic aerodynamics	X	X	X	X	X
9	Human factors	X	X	X	X	X
10	Aviation legislation	X	X	X	X	X
11A	Turbine aeroplane aerodynamics, structures and systems	X				
11B	Piston aeroplane aerodynamics, structures and systems		X			
12	Helicopter aerodynamics, structures and systems			X	X	
13	Aircraft aerodynamics, structures and systems					X
14	Propulsion					X
15	Gas turbine engine	X		X		
16	Piston engine		X		X	
17	Propeller	X	X			

B1.2 Trade Syllabi

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Module 1 - Mathematics	Level of knowledge for the category B1.2	MEA Units
1.1 Arithmetic	2	
Arithmetical terms and signs, methods of multiplication and division, fractions and decimals, factors and multiples, weights, measures and conversion factors, ratio and proportion, averages and percentages, areas and volumes, squares, cubes, square and cube roots.		
1.2 Algebra	2	
(a) Evaluating simple algebraic expressions, addition, subtraction, multiplication and division, use of brackets, simple algebraic fractions;		
(b) Linear equations and their solutions; Indices and powers, negative and fractional indices; Binary and other applicable numbering systems; Simultaneous equations and second degree equations with one unknown; Logarithms.	1	
1.3 Geometry	1	
(a) Simple geometrical constructions;		
(b) Graphical representation, nature and uses of graphs, graphs of equations and functions;	2	
(c) Simple trigonometry, trigonometrical relationships, use of tables and rectangular and polar coordinates.	2	

Module 2 Physics	Level of knowledge for the category B1.2	MEA Units
2.1 Matter	1	
Nature of matter: the chemical elements, structure of atoms, molecules; Chemical compounds; States: solid, liquid and gaseous; Changes between states.		
2.2 Mechanics ***2.2.1 Statics***	2	
Forces, moments and couples, representation as vectors; Centre of gravity; Elements of theory of stress, strain and elasticity: tension, compression, shear and torsion; Nature and properties of solid, fluid and gas; Pressure and buoyancy in liquids (barometers).		
2.2.2 Kinetics	2	
Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity); Rotational movement: uniform circular motion (centrifugal and centripetal forces); Periodic motion: pendular movement; Simple theory of vibration, harmonics and resonance; Velocity ratio, mechanical advantage and efficiency.		

Module 2 Physics	Level of knowledge for the category B1.2	MEA Units
2.2.3 Dynamics	2	
(a) Mass; Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency;		
(b) Momentum, conservation of momentum; Impulse; Gyroscopic principles; Friction: nature and effects, coefficient of friction (rolling resistance).	2	
2.2.4 Fluid dynamics	2	
(a) Specific gravity and density;		
(b) Viscosity, fluid resistance, effects of streamlining; Effects of compressibility on fluids; Static, dynamic and total pressure: Bernoulli's Theorem, venturi.	2	
2.3 Thermodynamics	2	
(a) Temperature: thermometers and temperature scales: Celsius, Fahrenheit and Kelvin, heat definition;		
(b) Heat capacity, specific heat; Heat transfer: convection, radiation and conduction; Volumetric expansion; First and second law of thermodynamics; Gases: ideal gases laws, specific heat at constant volume and constant pressure, work done by expanding gas; Isothermal, adiabatic expansion and compression, engine cycles, constant volume and constant pressure, refrigerators and heat pumps; Latent heats of fusion and evaporation, thermal energy, heat of combustion.	2	
2.4 Optics (light)	2	
Nature of light, speed of light; Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; Fiberoptics.		
2.5 Wave motion and sound	2	
Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves; Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.		

Module 3 Electrical fundamentals	Level of knowledge for the category B1.2	MEA Units
3.1 Electron theory	1	
Structure and distribution of electrical charges within atoms, molecules, ions, compounds; Molecular structure of conductors, semiconductors and insulators.		
3.2 Static electricity and conduction	2	
Static electricity and distribution of electrostatic charges;		

Module 3 Electrical fundamentals	Level of knowledge for the category	MEA Units
	B1.2	
Electrostatic laws of attraction and repulsion; Units of charge, Coulomb's Law; Conduction of electricity in solids, liquids, gases and vacuum.		
3.3 Electrical terminology	2	
The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.		
3.4 Generation of electricity	1	
Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion.		
3.5 DC sources of electricity	2	
Construction and basic chemical action of: primary cells, secondary cells, lead acid cells, nickel cadmium cells, other Alkaline cells; Cells connected in series and parallel; Internal resistance and its effect on a battery; Construction, materials and operation of thermocouples; Operation of photo-cells.		
3.6 DC circuits	2	
Ohms Law, Kirchoff's Voltage and Current Laws; Calculations using the above laws to find resistance, voltage and current; Significance of the internal resistance of a supply.		
3.7 Resistance and resistor	2	
(a) Resistance and affecting factors; Specific resistance; Resistor colour code, values and tolerances, preferred values, wattage ratings; Resistors in series and parallel; Calculation of total resistance using series parallel and series parallel combinations; Operation and use of potentiometers and rheostats; Operation of Wheatstone Bridge;		
(b) Positive and negative temperature coefficient conductance; Fixed resistors, stability, tolerance and limitations, methods of construction; Variable resistors, thermistors, voltage dependent resistors; Construction of potentiometers and rheostats; Construction of Wheatstone Bridge.	1	
3.8 Power	2	
Power, work and energy (kinetic and potential); Dissipation of power by a resistor; Power formula; Calculations involving power, work and energy.		
3.9 Capacitance and capacitor	2	
Operation and function of a capacitor; Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating; Capacitor types, construction and function; Capacitor colour coding; Calculations of capacitance and voltage in series and parallel circuits; Exponential charge and discharge of a capacitor, time constants;		

Module 3 Electrical fundamentals	Level of knowledge for the category B1.2	MEA Units
Testing of capacitors.		
3.10 Magnetism	2	
(a) Theory of magnetism; Properties of a magnet; Action of a magnet suspended in the Earth's magnetic field; Magnetisation and demagnetisation; Magnetic shielding; Various types of magnetic material; Electromagnets construction and principles of operation; Hand clasp rules to determine: magnetic field around current carrying conductor.		
(b) Magneto-motive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care and storage of magnets.	2	
3.11 Inductance and inductor	2	
Faraday's Law; Action of inducing a voltage in a conductor moving in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction; The effect the rate of change of primary current and mutual inductance has on induced voltage; Factors affecting mutual inductance: number of turns in coil, physical size of coil, permeability of coil, position of coils with respect to each other; Lenz's Law and polarity determining rules; Back emf, self-induction; Saturation point; Principal uses of inductors.		
3.12 DC motor and generator theory	2	
Basic motor and generator theory; Construction and purpose of components in DC generator; Operation of, and factors affecting output and direction of, current flow in DC generators; Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors; Series wound, shunt wound and compound motors; Starter generator construction.		
3.13 AC theory	2	
Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power; Triangular and square waves; Single and 3 phase principles.		
3.14 Resistive (R), Capacitive (C) and Inductive (L) Circuits	2	
Phase relationship of voltage and current in L, C and R circuits, parallel, series and series parallel; Power dissipation in L, C and R circuits; Impedance, phase angle, power factor and current calculations; True power, apparent power and reactive power calculations.		

Module 3 Electrical fundamentals	Level of knowledge for the category B1.2	MEA Units
3.15 Transformers	2	
Transformer construction principles and operation; Transformer losses and methods for overcoming them; Transformer action under load and no-load conditions; Power transfer, efficiency, polarity markings; Calculation of line and phase voltages and currents; Calculation of power in a 3 phase system; Primary and secondary current, voltage, turns ratio, power, efficiency; Autotransformers.		
3.16 Filters	1	
Operation, application and uses of the following filters: low pass, high pass, band pass, band stop.		
3.17 AC generators	2	
Rotation of loop in a magnetic field and waveform produced; Operation and construction of revolving armature and revolving field type AC generators; Single phase, 2 phase and 3 phase alternators; Three phase star and delta connections advantages and uses; Permanent magnet generators.		
3.18 AC motors	2	
Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase; Methods of speed control and direction of rotation; Methods of producing a rotating field: capacitor, inductor, shaded or split pole.		

Module 4 Electronic fundamentals	Level of knowledge for the category B1.2	MEA Units
4.1 Semiconductors	2	
4.1.1 Diodes		
(a) Diode symbols; Diode characteristics and properties; Diodes in series and parallel; Main characteristics and use of silicon controlled rectifiers (thyristors), light emitting diode, photo conductive diode, varistor, rectifier diodes; Functional testing of diodes;		
4.1.2 Transistors	1	
(a) Transistor symbols; Component description and orientation; Transistor characteristics and properties;		
4.1.3 Integrated circuits		
(a) Description and operation of logic circuits and linear circuits and operational amplifiers;	1	
4.2 Printed circuit boards	1	
Description and use of printed circuit boards.		

Module 4 Electronic fundamentals	Level of knowledge for the category B1.2	MEA Units
4.3 Servomechanisms		
(a) Understanding of the following terms: open and closed loop systems, feedback, follow up, analogue transducers; Principles of operation and use of the following synchro system components and features: resolvers, differential, control and torque, transformers, inductance and capacitance transmitters;	1	

Module 5 Digital techniques/electronic instrument systems	Level of knowledge for the category B1.2	MEA Units
5.1 Electronic instrument systems	2	
Typical systems arrangements and cockpit layout of electronic instrument systems.		
5.10 Fibre optics	1	
Advantages and disadvantages of fibre-optic data transmission over electrical wire propagation; Fibre-optic data bus; Fibre-optic related terms; Terminations; Couplers, control terminals, remote terminals; Application of fibre optics in aircraft systems.		
5.11 Electronic displays	1	
Principles of operation of common types of displays used in modern aircraft, including cathode ray tubes, light emitting diodes and liquid crystal display.		
5.12 Electrostatic sensitive devices	2	
Special handling of components sensitive to electrostatic discharges; Awareness of risks and possible damage, component and personnel anti-static protection devices.		
5.13 Software management control	1	
Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programs.		
5.14 Electromagnetic environment	2	
Influence of the following phenomena on maintenance practices for electronic system: • EMC – electromagnetic compatibility • EMI – electromagnetic interference • HIRF – high-intensity radiated field • Lightning and lightning protection.		

Module 5 Digital techniques/electronic instrument systems	Level of knowledge for the category	MEA Units
	B1.2	
5.15 Typical electronic/digital aircraft systems	2	
General arrangement of typical electronic/digital aircraft systems and associated built-in test equipment (BITE), such as the following: • ACARS – ARINC communication and addressing and reporting system • ECAM – electronic centralised aircraft monitoring • EFIS – electronic flight instrument system • EICAS – engine indication and crew alerting system • FBW – fly-by-wire • FMS – flight management system • GPS – global positioning system • IRS – inertial reference system • TCAS – traffic alert collision avoidance system.		

Module 6 Materials and hardware	Level of knowledge for the category B1	MEA Units
6.1 Aircraft materials ferrous		
(a) Characteristics, properties and identification of common alloy steels used in aircraft; Heat treatment and application of alloy steels;	2	
(b) Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.	1	
6.2 Aircraft materials — non-ferrous	2	
(a) Characteristics, properties and identification of common non-ferrous materials used in aircraft; Heat treatment and application of non-ferrous materials;		
(b) Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.	1	
6.3 Aircraft materials — composite and non-metallic	2	
6.3.1 Composite and non-metallic other than wood and fabric		
(a) Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; Sealant and bonding agents;		
(b) The detection of defects and deterioration in composite and non-metallic material; Repair of composite and non-metallic material.	2	
6.3.2 Wooden structures *[Elective]*	2	
Construction methods of wooden airframe structures; Characteristics, properties and types of wood and glue used in aeroplanes; Preservation and maintenance of wooden structure; Types of defects in wood material and wooden structures; The detection of defects in wooden structure; Repair of wooden structure.		
6.3.3 Fabric covering *[Elective]*	2	
Characteristics, properties and types of fabrics used in aeroplanes; Inspections methods for fabric; Types of defects in fabric; Repair of fabric covering.		
6.4 Corrosion		
(a) Chemical fundamentals; Formation by galvanic action process, microbiological, stress;	1	
(b) Types of corrosion and their identification; Causes of corrosion; Material types, susceptibility to corrosion.	3	
6.5 Fasteners	2	
6.5.1 Screw threads		
Screw nomenclature; Thread forms, dimensions and tolerances for standard threads used in aircraft; Measuring screw threads;		

Module 6 Materials and hardware	Level of knowledge for the category	MEA Units
	B1	
6.5.2 Bolts, studs and screws	2	
Bolt types: specification, identification and marking of aircraft bolts, international standards; Nuts: self-locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types and uses, insertion and removal; Self tapping screws, dowels.		
6.5.3 Locking devices	2	
Tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick release fasteners, keys, circlips, cotter pins.		
6.5.4 Aircraft rivets	2	
Types of solid and blind rivets: specifications and identification, heat treatment.		
6.6 Pipes and unions		
(a) Identification of, and types of, rigid and flexible pipes and their connectors used in aircraft;	2	
(b) Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.	2	
6.7 Springs	2	
Types of springs, materials, characteristics and applications.		
6.8 Bearings	2	
Purpose of bearings, loads, material, construction; Types of bearings and their application.		
6.9 Transmissions	2	
Gear types and their application; Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns; Belts and pulleys, chains and sprockets.		
6.10 Control cables	2	
Types of cables; End fittings, turn buckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems.		
6.11 Electrical cables and connectors	2	
Cable types, construction and characteristics; High tension and co-axial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes.		

Module 7 Maintenance practices	Level of knowledge for the category B1.2	MEA Units
7.1 Safety precautions — aircraft and workshop	3	
Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals; Instruction in the remedial action to be taken in the event of a fire or another accident with one or more of these hazards including knowledge on extinguishing agents.		
7.2 Workshop practices	3	
Care of tools, control of tools, use of workshop materials; Dimensions, allowances and tolerances, standards of workmanship; Calibration of tools and equipment, calibration standards.		
7.3 Tools	3	
Common hand tool types; Common power tool types; Operation and use of precision measuring tools; Lubrication equipment and methods; Operation, function and use of electrical general test equipment.		
7.4 Avionic general test equipment	**2**	
Operation, function and use of avionic general test equipment.		
7.5 Engineering drawings, diagrams and standards	**2**	
Drawing types and diagrams, their symbols, dimensions, tolerances and projections; Identifying title block information; Microfilm, microfiche and computerised presentations; Specification 100 of the ATA; Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; Wiring diagrams and schematic diagrams.		
7.6 Fits and clearances	**2**	
Drill sizes for bolt holes, classes of fits; Common system of fits and clearances; Schedule of fits and clearances for aircraft and engines; Limits for bow, twist and wear; Standard methods for checking shafts, bearings and other parts.		
7.7 Electrical wiring interconnection system (EWIS)	**3**	
Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Co-axial cables: testing and installation precautions; Identification of wire types, their inspection criteria and damage tolerance; Wiring-protection techniques: cable looming and loom support, cable clamps, protective sleeving techniques, including heat shrink wrapping, shielding; EWIS installations, inspection, repair, maintenance and cleanliness standards.		
7.8 Riveting	2	
Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.		
7.9 Pipes and hoses	2	
Bending and belling and flaring aircraft pipes;		

Module 7 Maintenance practices	Level of knowledge for the category B1.2	MEA Units
Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes.		
7.10 Springs	2	
Inspection and testing of springs.		
7.11 Bearings	2	
Testing, cleaning and inspection of bearings; Lubrication requirements of bearings; Defects in bearings and their causes.		
7.12 Transmissions	2	
Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.		
7.13 Control cables	2	
Swaging of end fittings; Inspection and testing of control cables; Bowden cables; Aircraft flexible control systems.		
7.14 Material handling	2	
7.14.1 Sheet Metal		
Marking out, and calculation of, bend allowance; Sheet metal working including bending and forming; Inspection of sheet metal work.		
7.14.2 Composite and non-metallic	2	
Bonding practices; Environmental conditions; Inspection methods.		
7.15 Welding, brazing, soldering and bonding	2	
(a) Soldering methods, inspection of soldered joints;		
(b) Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.	2	
7.16 Aircraft weight and balance		
(a) Centre of gravity and balance limits calculation: use of relevant documents;	2	
(b) Preparation of aircraft for weighing; Aircraft weighing.	2	
7.17 Aircraft handling and storage	2	
Aircraft taxiing and towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; Aircraft storage methods; Refuelling and defuelling procedures; De-icing and anti-icing procedures; Electrical, hydraulic and pneumatic ground supplies; Effects of environmental conditions on aircraft handling and operation.		

Module 7 Maintenance practices	Level of knowledge for the category B1.2	MEA Units
7.18 Disassembly, inspection, repair and assembly techniques	3	
(a) Types of defects and visual inspection techniques; Corrosion removal, assessment and reprotection;		
(b) General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programs;	2	
(c) Non-destructive inspection techniques including: penetrant, radiographic, eddy current, ultrasonic and borescope methods;	2	
(d) Disassembly and re-assembly techniques;	2	
(e) Trouble shooting techniques.	2	
7.19 Abnormal events	2	
(a) Inspections following lightning strikes and HIRF penetration.		
(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2	
7.20 Maintenance procedures	2	
Maintenance planning; Modification procedures; Stores procedures; Certification and release procedures; Interface with aircraft operation; Maintenance inspection, quality control and quality assurance; Additional maintenance procedures; Control of life limited components.		

Module 8 Basic aerodynamics	Level of knowledge for the category B1.2	MEA Units
8.1 Physics of the atmosphere	2	
International Standard Atmosphere (ISA), application aerodynamics.		
8.2 Aerodynamics	2	
Air flow around a body; Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, up wash and downwash, vortices, stagnation; The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash in and washout, fineness ratio, wing shape and aspect ratio; Thrust, weight, aerodynamic resultant; Generation of lift and drag: angle of attack, lift coefficient, drag coefficient, polar curve, stall; Aerofoil contamination including ice, snow, frost.		
8.3 Theory of flight	2	
Relationship between lift, weight, thrust and drag; Glide ratio; Steady state flights, performance;		

Module 8 Basic aerodynamics	Level of knowledge for the category	MEA Units
	B1.2	
Theory of the turn; Influence of load factor: stall, flight envelope and structural limitations; Lift augmentation.		
8.4 Flight stability and dynamics	2	
Longitudinal, lateral and directional stability (active and passive).		

Module 9 Human factors	Level of knowledge for the category	MEA Units
	B1.2	
9.1 General	2	
The need to take human factors into account; Incidents attributable to human factors and human error; "Murphy's" law.		
9.2 Human performance and limitations	2	
Vision; Hearing; Information processing; Attention and perception; Memory; Claustrophobia and physical access.		
9.3 Social psychology	1	
Responsibility: individual and group; Motivation and de-motivation; Peer pressure; Culture issues; Team working; Management, supervision and leadership.		
9.4 Factors affecting performance	2	
Fitness and health; Stress: domestic and work related; Time pressure and deadlines; Workload: overload and underload; Sleep and fatigue, shiftwork; Alcohol, medication, drug abuse.		
9.5 Physical environment	1	
Noise and fumes; Illumination; Climate and temperature; Motion and vibration; Working environment.		

Module 9 Human factors	Level of knowledge for the category B1.2	MEA Units
9.6 Tasks	1	
Physical work; Repetitive tasks; Visual inspection; Complex systems.		
9.7 Communication	2	
Within and between teams; Work logging and recording; Keeping up-to-date, currency; Dissemination of information.		
9.8 Human error	2	
Error models and theories; Types of error in maintenance tasks; Implications of errors (i.e. accidents); Avoiding and managing errors.		
9.9 Hazards in the workplace	2	
Recognising and avoiding hazards; Dealing with emergencies.		

Module 11B Piston aeroplane aerodynamics, structures and systems	Level of knowledge for the category B1.2	MEA Units
11.1 Theory of flight	2	
11.1.1 Aeroplane aerodynamics and flight controls		
Operation and effect of the following: • 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; Effects of wing fences, sawtooth leading edges; Boundary layer control, using vortex generators, stall wedges or leading-edge devices; Operation and effect of trim tabs, balance and anti-balance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.		

Module 11B Piston aeroplane aerodynamics, structures and systems	Level of knowledge for the category B1.2	MEA Units
11.2 Airframe structures —general concepts	2	
(a) Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail-safe, safe-life and 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;		
(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.	2	
11.3 Airframe structures —aeroplanes	2	
11.3.1 Fuselage (ATA52/53/56)		
Construction and pressurisation sealing; Wing, tailplane, pylon and undercarriage attachments; Seat installation; Doors and emergency exits: construction and operation; Windows and windscreen attachment.		
11.3.2 Wings (ATA57)	2	
Construction; Fuel storage; Landing gear, pylon, control surface and high-lift/drag attachments.		
11.3.3 Stabilisers (ATA55)	2	
Construction; Control surface attachment.		
11.3.4 Flight control surfaces (ATA55/57)	2	
Construction and attachment; Balancing —mass and aerodynamic.		
11.3.5 Nacelles and pylons (ATA54)	2	
Construction; Firewalls Engine mounts.		
11.4 Air-conditioning and cabin pressurisation (ATA21)	3	
Pressurisation and air-conditioning systems; Cabin pressure controllers; Protection and warning devices;		

Module 11B Piston aeroplane aerodynamics, structures and systems	Level of knowledge for the category B1.2	MEA Units
Heating systems.		
11.5 Instruments and avionic systems		
11.5.1 Instrument systems (ATA31)	2	
Pitot static: altimeter, airspeed 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	
Fundamentals of system layouts, and operation of the following: • auto flight (ATA22) • communications (ATA23) • navigation systems (ATA34).		
11.6 Electrical power (ATA24)	3	
Batteries installation and operation; DC-power generation; Voltage regulation; Power distribution; Circuit protection; Inverters, transformers.		
11.7 Equipment and furnishings (ATA25)	2	
(a) Emergency equipment requirements; Seats, harnesses and belts;		
(b) Cabin layout; Equipment layout; Cabin furnishing installation; Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment; Airstairs.	1	
11.8 Fire protection (ATA26)		
(a) Fire and smoke detection and warning systems; Fire extinguishing systems; System tests;	3	
(b) Portable fire extinguisher.	2	
11.9 Flight controls (ATA27)	3	
Primary controls: aileron, elevator, rudder; Trim tabs; High-lift devices; System operation: manual; Gust locks;		

Module 11B Piston aeroplane aerodynamics, structures and systems	Level of knowledge for the category B1.2	MEA Units
Balancing and rigging; Stall warning system.		
11.10 Fuel systems (ATA28)	3	
System layout; Fuel tanks; Supply systems; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling.		
11.11 Hydraulic power (ATA29)	3	
System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical; Filters; Pressure control; Power distribution; Indication and warning systems.		
11.12 Ice and rain protection (ATA30)	3	
Ice formation, classification and detection; De-icing systems: electrical, hot air, pneumatic and chemical; Probe and drain heating; Wiper systems.		
11.13 Landing gear (ATA32)	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 (ATA33)	3	
External: navigation, anti-collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.		
11.15 Oxygen (ATA35)	3	
System layout: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings.		

Module 11B Piston aeroplane aerodynamics, structures and systems	Level of knowledge for the category B1.2	MEA Units
11.16 Pneumatic and vacuum (ATA36)	3	
System layout; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure and vacuum pumps; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.		
11.17 Water and waste (ATA38)	3	
Water system layout, supply, distribution, servicing and draining; Toilet system layout, flushing and servicing; Corrosion aspects.		

Module 16 Piston engine	Level of knowledge for the category B1.2	MEA Units
16.1 Fundamentals	2	
Mechanical, thermal and volumetric efficiencies; Operating principles: 2 stroke, 4 stroke, otto and diesel; Piston displacement and compression ratio; Engine configuration and firing order.		
16.2 Engine performance	2	
Power calculation and measurement; Factors affecting engine power; Mixtures and leaning, pre-ignition.		
16.3 Engine construction	2	
Crankcase, crankshaft, camshafts, sumps; Accessory gearbox; Cylinder and piston assemblies; Connecting rods, inlet and exhaust manifolds; Valve mechanisms; Propeller reduction gearboxes.		
16.4 Engine fuel systems	2	
16.4.1 Carburettors		
Types, construction and principles of operation; Icing and heating.		
16.4.2 Fuel injection systems	2	
Types, construction and principles of operation.		
16.4.3 Electronic engine control	2	
Operation of engine control and fuel metering systems including: electronic engine control (FADEC), systems layout and components.		

Module 16 Piston engine	Level of knowledge for the category	MEA Units
	B1.2	
16.5 Starting and ignition systems	2	
Starting systems, pre-heat systems; Magneto types, construction and principles of operation; Ignition harnesses, sparkplugs; Low and high-tension systems.		
16.6 Induction, exhaust and cooling systems	2	
Construction and operation of induction systems, including alternate air systems; Exhaust systems, engine cooling systems — air and liquid.		
16.7 Supercharging and turbo charging	2	
Principles and purpose of supercharging and its effects on engine parameters; Construction and operation of supercharging and turbo charging systems; System terminology; Control systems; System protection.		
16.8 Lubricants and fuels	2	
Properties and specifications; Fuel additives; Safety precautions.		
16.9 Lubrication systems	2	
System operation and layout and components.		
16.10 Engine indication systems	2	
Engine speed; Cylinder head temperature; Coolant temperature; Oil pressure and temperature; Exhaust gas temperature; Fuel pressure and flow; Manifold pressure.		
16.11 Powerplant installation	2	
Configuration of firewalls, cowlings, acoustic panels, engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.		
16.12 Engine monitoring and ground operation	3	
Procedures for starting and ground run-up; Interpretation of engine power output and parameters; Inspection of engine and components: criteria, tolerances and data specified by engine manufacturer.		
16.13 Engine storage and preservation	2	
Preservation and depreservation for the engine and accessories and systems.		

Module 17 Propeller	Level of knowledge for the category	MEA Units
	B1	
17.1 Fundamentals	2	
Blade element theory; High and low blade angle, reverse angle, angle of attack, rotational speed; Propeller slip; Aerodynamic, centrifugal, and thrust forces; Torque; Relative airflow on blade angle of attack; Vibration and resonance.		
17.2 Propeller construction	2	
Construction methods and materials used in wooden, composite and metal propellers; Blade station, blade face, blade shank, blade back and hub assembly; Fixed pitch, controllable pitch, constant speeding propeller; Propeller and spinner installation.		
17.3 Propeller pitch control	2	
Speed control and pitch change methods, mechanical and electrical and electronic; Feathering and reverse pitch; Overspeed protection.		
17.4 Propeller synchronising	2	
Synchronising and synchrophasing equipment.		
17.5 Propeller ice protection	2	
Fluid and electrical de-icing equipment.		
17.6 Propeller maintenance	3	
Static and dynamic balancing; Blade tracking; Assessment of blade damage, erosion, corrosion, impact damage, delamination; Propeller treatment and repair schemes; Propeller engine running.		
17.7 Propeller storage and preservation	2	
Propeller preservation and depreservation.		

Post Trade Training Licencing Module 10

Module 10Aviation legislation	Level of knowledge for the category B1	MEA Units
10.1 Regulatory Framework Role of International Civil Aviation Organization; Role of CASA; Relationship between Parts 21, 42, 66, 145 and 147 of CASR 1998; Relationship with other aviation authorities.	1	
10.2 Part 66 Certifying Staff Detailed understanding of Part 66 of CASR 1998.	2	
10.3 Part 145 – Approved maintenance organisations Detailed understanding of Part 145 of CASR 1998.	2	
10.4 Air operations Air Operators' Certificates; Operators' responsibilities, in particular regarding continuing airworthiness and maintenance; Aircraft maintenance program; MEL/CDL; Documents to be carried on board; Aircraft placarding (markings).	1	
10.5 Certification of aircraft, parts and appliances (a) General General understanding of Parts 21, 23, 25, 27 and 29 of CASR 1998; (b) Documents Certificates of Airworthiness; Restricted Certificates of Airworthiness; Special Flight Permits; Certificates of Registration; Noise Certificates; Weight Schedules; Radio Station Licences and Approvals.	2	
10.6 Continuing airworthiness (a) Detailed understanding of Part 21 of CASR 1998 provisions relating to continuing airworthiness; (b) Detailed understanding of Part 42 of CASR 1998.	2	

Module 10Aviation legislation	Level of knowledge for the category B1	MEA Units
10.7 Applicable national and international requirements		
(a) Management programs, maintenance checks and inspections; Master Minimum Equipment Lists, Minimum Equipment List, Dispatch Deviation Lists; Airworthiness Directives; Service bulletins, manufacturers' service information; Modification and repairs; Maintenance documentation: maintenance manuals, structural repair manuals, illustrated parts catalogue, etc.	2	
(b) Continuing airworthiness; Minimum equipment requirements — test flights; ETOPS, maintenance and dispatch requirements; All weather operations: categories 2 and 3 operations.	1	